KSC-PLN-1733 Rev A-1

Integrated Cultural Resource Management Plan

NASA KENNEDY SPACE CENTER
BREVARD AND VOLUSIA COUNTIES, FL

FISCAL YEARS 2015-2019

OCTOBER 2014

Prepared for:

National Aeronautics and Space Administration
Kennedy Space Center
Environmental Management Branch
Kennedy Space Center, FL 32899

Prepared By:

Medical and Environmental Support Contract (MESC)
InoMedic Health Applications, Inc.
Environmental Services Branch
IHA-022 KSC, FL 32899

RELEASED - Printed documents may be obsolete; validate prior to use.

TABLE OF CONTENTS

LIST OF FIGURES **VII**

LIST OF TABLES **VIII**

LIST OF ACRONYMS AND ABBREVIATIONS **IX**

CHAPTER 1.0 INTRODUCTION **1-1**

1.1 GOALS AND OBJECTIVES 1-1
1.1.1 Mission Statement 1-1
1.1.2 Statement of Purpose 1-1

1.2 ORGANIZATION OF THE ICRMP 1-2

1.3 STATUTORY AUTHORITIES 1-2
1.3.1 Introduction 1-2
1.3.2 National Historic Preservation Act (NHPA) of 1966 1-3
1.3.3 National Environmental Policy Act (NEPA) of 1969 1-4
1.3.4 Executive Order (EO) 11593: Protection and Enhancement of the Cultural Environment 1-5
1.3.5 American Indian Religious Freedom Act (AIRFA) of 1978 1-5
1.3.6 Archaeological Resources Protection Act (ARPA) of 1979 1-5
1.3.7 Native American Graves Protection and Repatriation Act (NAGPRA) of 1990 1-5
1.3.8 EO 13007: Indian Sacred Sites (1996) and EO 13175: Consultation and Coordination with Indian Tribal Governments (2000) 1-6
1.3.9 EO 13287: Preserve America 1-6
1.3.10 Chapter 267, F.S. (Florida Historical Resources Act) 1-6

1.4 THE SECTION 106 COMPLIANCE PROCESS 1-6
1.4.1 The 4-Step Section 106 Review Process 1-10
1.4.2 Section 106 Consultation Process 1-12
1.4.3 Consideration of Alternatives and Mitigation Measures 1-13
1.4.4 Preparation of Section 106 Documentation 1-13
1.4.5 Agreement Documents 1-13
1.4.6 KSC Streamlines the Section 106 Compliance Process 1-14

1.5 INTEGRATING NEPA AND SECTION 106 1-15

1.6 NASA POLICIES AND DIRECTIVES 1-15

EXHIBIT 1-1 CODE OF FEDERAL REGULATIONS PERTINENT TO CRM
EXHIBIT 1-2 NASA SECTION 106 CHECKLIST
EXHIBIT 1-3 SECTION 106 PROCESS FLOW CHART
EXHIBIT 1-4 AGREEMENT BETWEEN NASA AND THE SMITHSONIAN INSTITUTE CONCERNING THE TRANSFER AND MANAGEMENT OF NASA HISTORICAL ARTIFACTS
EXHIBIT 1-5 MEMORANDUM OF AGREEMENT BETWEEN NASA AND GSA OFFICE OF PERSONAL PROPERTY MANAGEMENT FEBRUARY 19, 2014

RELEASED - Printed documents may be obsolete; validate prior to use.

TABLE OF CONTENTS

CHAPTER 2.0 ENVIRONMENTAL AND HISTORICAL OVERVIEWS 2-1

2.1 INTRODUCTION 2-1

2.2 PHYSICAL SETTING 2-1

2.3 HISTORY OF LAND ACQUISITION 2-3

2.4 CURRENT LAND USE 2-4
2.4.1 Operational Areas 2-4
2.4.2 Undeveloped Lands 2-5

2.5 PRECONTACT AND HISTORIC CONTEXTS 2-5
2.5.1 Introduction 2-5
2.5.2 Research Domains 2-6

CHAPTER 3.0 ACCOMPLISHMENTS 3-1

3.1 INTRODUCTION 3-1

3.2 ARCHAEOLOGICAL INVESTIGATIONS 3-1
3.2.1 Early Work: 1870s through 1960s 3-1
3.2.2 Archaeological Surveys: 1970 through 2013 3-2
3.2.3 KSC-wide Predictive Model Survey 3-6
3.2.4 Predictive Model Update 3-9
3.2.5 Mitigative Archaeological Excavation 3-11
3.2.6 Partnerships and Other Accomplishments 3-11

3.3 HISTORIC FACILITIES SURVEYS 3-12
3.3.1 The Launch Complex 39 (LC-39) Site 3-12
3.3.2 LC-39 Site Reassessment and Historic Facilities Survey 3-12
3.3.3 Survey of NASA-owned Facilities at CCAFS and NHL Determinations 3-13
3.3.4 Space Shuttle Program and Other Historical Surveys 3-14

3.4 DETERMINATIONS OF EFFECT 3-15

3.5 AGREEMENT DOCUMENTS 3-15
3.5.1 Memoranda of Agreement 3-15
3.5.2 Programmatic Agreements 3-16

3.6 MITIGATION MEASURES FOR HISTORIC FACILITIES 3-16
3.6.1 HABS/HAER Documentation 3-16
3.6.2 Other Mitigation Measures 3-17

3.7 FORESEEABLE UNDERTAKINGS 3-22

3.8 STATUTORY REPORTING REQUIREMENTS 3-22

3.9 AWARDS 3-22

EXHIBIT 3-1 SHPO CORRESPONDENCE REGARDING ARCHAEOLOGICAL SURVEYS TO ESTABLISH ZONES OF ARCHAEOLOGICAL POTENTIAL

RELEASED - Printed documents may be obsolete; validate prior to use.

EXHIBIT 3-2 NONREIMBURSABLE SPACE ACT AGREEMENT REGARDING THE CLIFTON SCHOOLHOUSE (2006)
EXHIBIT 3-3 SHPO CONCURRENCE LETTER REGARDING HISTORIC FACILITIES SURVEY AND REASSESSMENT OF THE EXISTING NRHP LC-39 SITE (8BR172) (1998)
EXHIBIT 3-4 EVALUATING HISTORIC RESOURCES ASSOCIATED WITH THE SPACE SHUTTLE PROGRAM: CRITERIA OF ELIGIBILITY FOR LISTING IN THE NATIONAL REGISTER OF HISTORIC PLACES (NRHP)
EXHIBIT 3-5 SHPO CONCURRENCE LETTERS FOR HISTORIC FACILITIES SURVEYS AND DETERMINATIONS OF ELIGIBILITY
EXHIBIT 3-6 MEMORANDUM OF AGREEMENT FOR LC-39 (1974)
EXHIBIT 3-7 LOAN AGREEMENT FOR RESTORATION AND MOVEMENT OF THE SATURN V LAUNCH VEHICLE (1994)
EXHIBIT 3-8 MEMORANDUM OF AGREEMENT FOR THE LC-34 ENGINEERING SUPPORT BUILDING (2006)
EXHIBIT 3-9 MEMORANDUM OF AGREEMENT FOR THE REMOVAL OF THE SUN LOUVERS AND REPLACMENT OF THE WINDOWS ON THE LAUNCH CONTROL CENTER (2008)
EXHIBIT 3-10 MEMORANDUM OF AGREEMENT REGARDING THE DEMOLITION OF THE MISSION CONTROL CENTER (2009)
EXHIBIT 3-11 PROGRAMMATIC AGREEMENT REGARDING NASA FACILITIES DESIGNATED AS NATIONAL HISTORIC LANDMARKS (1989)
EXHIBIT 3-12 PROGRAMMATIC AGREEMENT REGARDING MANAGEMENT OF HISTORIC PROPERTIES AT KSC (2009)
EXHIBIT 3-13 MITIGATION PLAN FOR HISTORIC PROPERTIES

CHAPTER 4.0 CULTURAL RESOURCES INVENTORY 4-1

4.1 INTRODUCTION 4-1

4.2 WHAT IS A SIGNIFICANT CULTURAL RESOURCE? 4-1
4.2.1 National Register Property Types 4-1
4.2.2 NRHP Historic Districts versus Multiple Property Listings 4-2
4.2.3 The National Register Criteria for Evaluation 4-2
4.2.4 Criteria Considerations 4-3
4.2.5 Integrity 4-4
4.2.6 Evaluation of Significance 4-5
4.2.7 Boundaries 4-5

4.3 ARCHAEOLOGICAL SITES 4-5
4.3.1 Site Types 4-6
4.3.2 Archaeological Site Evaluations 4-7

4.4 SIGNIFICANT HISTORIC RESOURCES 4-10
4.4.1 Individually Listed and Eligible Historic Properties 4-11
4.4.2 Historic Districts 4-27
4.4.3 NASA-owned NHLs at CCAFS 4-42
4.4.4 Non-extant and Ineligible Historic Properties 4-44

EXHIBIT 4-1 PROPERTIES DETERMINED INELIGIBLE FOR LISTING IN THE NRHP

RELEASED - Printed documents may be obsolete; validate prior to use.

TABLE OF CONTENTS

CHAPTER 5.0 ADMINISTRATION, POLICY, AND PLANNING 5-1

5.1 INTRODUCTION 5-1

5.2 CRM ADMINISTRATION 5-1
5.2.1 Historic Preservation Officer 5-1
5.2.2 NASA Headquarters 5-2
5.2.3 External Regulatory and Review Agencies 5-2
5.2.4 Interagency Coordination 5-3
5.2.5 Contractors 5-5

5.3 NHPA COMPLIANCE 5-5
5.3.1 Section 110 Identification and Evaluation 5-5
5.3.2 Section 106 Review 5-7
5.3.3 Section 111 5-8

5.4 ARPA COMPLIANCE 5-11

5.5 NAGPRA COMPLIANCE 5-11

5.6 36 CFR PART 79 (CURATION) 5-13
5.6.1 Existing Collections 5-13
5.6.2 New Collections 5-15

5.7 EO 13287: PRESERVE AMERICA 5-15
5.7.1 Section 3 Reporting 5-15
5.7.2 Heritage Tourism 5-15

5.8 TREATMENT AND MITIGATION MEASURES FOR HISTORIC PROPERTIES 5-16
5.8.1 Condition Assessments 5-16
5.8.2 Treatment Strategies 5-17
5.8.3 Mitigation Measures 5-18
5.8.4 Specific Mitigation Options 5-18
5.8.5 Property-specific Mitigation 5-21

5.9 ARCHAEOLOGICAL SITE MANAGEMENT 5-22
5.9.1 Introduction 5-22
5.9.2 Condition Assessments 5-23
5.9.3 Protection Strategies 5-24
5.9.4 Data Recovery 5-31
5.9.5 Site-Specific Recommendations 5-31

5.10 RECORDS AND DATA MANAGEMENT 5-32
5.10.1 Routine Records Management 5-32
5.10.2 NETS CRM Database 5-33
5.10.3 GIS-based Mapping 5-33

5.11 CRM TRAINING 5-33

5.12 PUBLIC OUTREACH 5-33

5.13 CRM PROGRAM PLANNING 5-34

RELEASED - Printed documents may be obsolete; validate prior to use.

5.14 ICRMP IMPLEMENTATION 5-34

EXHIBIT 5-1 SELECTED AGENCY CONTACTS
EXHIBIT 5-2 INTERAGENCY AGREEMENT BETWEEN NASA, KSC AND THE U.S. DOI, FWS FOR USE AND MANAGEMENT OF PROPERTY AT NASA, KSC KNOWN AS THE MERRITT ISLAND NATIONAL WILDLIFE REFUGE (MINWR)
EXHIBIT 5-3 AGREEMENT BETWEEN NASA AND DOI FOR USE OF PROPERTY AT KSC, NASA AS A PART OF THE CANAVERAL NATIONAL SEASHORE
EXHIBIT 5-4 KSC ARCHAEOLOGICAL RESOURCES LOAN AGREEMENTS WITH CNS
EXHIBIT 5-5 SECRETARY OF THE INTERIOR'S STANDARDS FOR REHABILITATION (36 CFR Part 67)

CHAPTER 6.0 STANDARD OPERATING PROCEDURES 6-1

6.1 INTRODUCTION 6-1

6.2 STANDARD OPERATING PROCEDURES 6-1

SOP #1: PROJECT REVIEW FOR NEW UNDERTAKINGS 6-2
SOP #2: ASSESSMENT AND RESOLUTION OF ADVERSE EFFECTS 6-5
SOP #3: PUBLIC PARTICIPATION IN THE SECTION 106 CONSULTATION PROCESS 6-8
SOP #4: NATIVE AMERICAN CONSULTATION 6-9
SOP #5: UNANTICIPATED DISCOVERIES OF ARCHAEOLOGICAL MATERIALS. 6-11
SOP #6: INADVERTENT DISCOVERIES OF HUMAN REMAINS 6-13
SOP #7: PHASE I ARCHAEOLOGICAL SURVEY 6-15
SOP #8: PHASE II TEST EXCAVATION. 6-17
SOP #9: PHASE III MITIGATIVE EXCAVATION AND DATA RECOVERY 6-19
SOP #10: ARCHAEOLOGICAL COLLECTIONS MANAGEMENT 6-21
SOP #11: IDENTIFICATION AND EVALUATION OF HISTORIC PROPERTIES 6-22
SOP #12: HABS/HAER DOCUMENTATION 6-24
SOP #13: ADMINISTRATIVE TASKS FOR COMPLETING DATA CALLS AND UPLOADING CORRESPONDENCE AND DOCUMENTATION INTO THE CRM NETS MODULE 6-26

EXHIBIT 6-1 KSC ENVIRONMENTAL CHECKLIST
EXHIBIT 6-2 KSC RECORD OF ENVIRONMENTAL CONSIDERATION
EXHIBIT 6-3 INTERESTED PARTY CONTACTS FOR SECTION 106 CONSULTATION
EXHIBIT 6-4 UTILITY LOCATE/EXCAVATION PERMIT REQUEST
EXHIBIT 6-5 DHR SUFFICIENCY CHECKLIST
EXHIBIT 6-6 SECRETARY OF THE INTERIOR'S GUIDELINES FOR ARCHITECTURAL AND ENGINEERING DOCUMENTATION
EXHIBIT 6-7 COPYRIGHT RELEASE FORM

CHAPTER 7.0 BIBLIOGRAPHY AND REFERENCES CITED 7-1

CHAPTER 8.0 FEATURED HYPERLINKS 8-1

RELEASED - Printed documents may be obsolete; validate prior to use.

TABLE OF CONTENTS

CHAPTER 9.0 APPENDICES **9-1**

APPENDIX A:	Glossary of Key Terms	9-2
APPENDIX B:	Historic Context	9-11
APPENDIX B-1:	Prehistoric (Precontact) Context	9-12
APPENDIX B-2:	Historic Context	9-24
APPENDIX B-3:	The Space Age Context	9-63
APPENDIX C:	Original NRHP Nomination for the LC-39 Site	9-99
APPENDIX D:	Recorded Archaeological Sites Located at KSC	9-105
APPENDIX E:	NRHP Listed and Eligible Historic Properties	9-121
APPENDIX F:	Collections from KSC Archaeological Sites	9-130

RELEASED - Printed documents may be obsolete; validate prior to use.

List of Figures

Figure 1-1. Review of Potential Effects to Historic Properties Flow Chart (KDP-P-1733). 1-8
Figure 1-2. Basic Section 106 Flow Chart. 1-10
Figure 1-3. NEPA and Section 106 Coordination Flow Chart. CX (Categorical Exclusion), DEIS (Draft Environmental Impact Statement, FEIS (Final Environmental Impact Statement). 1-17
Figure 1-4. The Environmental Checklist Process Flow Chart (KDP-P-1727). 1-18
Figure 1-5. Flow Chart for Processing of KSC Real Property Agreements, KDP-KSC-P-1295. 1-20
Figure 2-1. Location of the Kennedy Space Center. 2-2
Figure 4-1. Remains of historic structure on the midden at Ross Hammock. 4-9
Figure 4-2. Sugar mill remains at 8VO160. 4-9
Figure 4-3. Slave-dug ditches at 8VO160. 4-10
Figure 4-4. Central Instrumentation Facility (CIF). 4-12
Figure 4-5. Neil Armstrong Operations and Checkout (O&C) Building. 4-12
Figure 4-6. Bioastronautics Operations Support Unit (BOSU). 4-13
Figure 4-7. Engineering Development Lab (EDL). 4-13
Figure 4-8. Vehicle Assembly Building (VAB). 4-14
Figure 4-9. Launch Control Center (LCC). 4-14
Figure 4-10. Crawler Transporters. 4-15
Figure 4-11. Crawlerway. 4-15
Figure 4-12. Press Site: Clock and Flag Pole. 4-16
Figure 4-13. Headquarters Building. 4-16
Figure 4-14. Launch Complex 39 – Pad A. 4-17
Figure 4-15. Launch Complex 39 – Pad B. 4-17
Figure 4-16. Beach House. 4-18
Figure 4-17. Shuttle Landing Facility (SLF) Runway. 4-18
Figure 4-18. Landing Aids Control Building (LACB). 4-19
Figure 4-19. Mate-Demate Device (MDD). 4-19
Figure 4-20. Orbiter Processing Facility (OPF) 1 and 2. 4-20
Figure 4-21. Orbiter Processing Facility (OPF) 3. 4-20
Figure 4-22. Hypergol Module Processing (HMP) North. 4-21
Figure 4-23. Thermal Protection System Facility (TPSF). 4-21
Figure 4-24. Rotation Processing Surge Facility (RPSF). 4-22
Figure 4-25. Manufacturing Building. 4-22
Figure 4-26. Parachute Refurbishment Facility (PRF). 4-23
Figure 4-27. Canister Rotation Facility (CRF). 4-23
Figure 4-28. Payload Canisters. 4-24
Figure 4-29. Retrieval Ships. 4-24
Figure 4-30. Mobile Launcher Platforms (MLP). 4-25
Figure 4-31. Hypergol Module Processing (HMP) South. 4-25
Figure 4-32. Missile Assembly Building AE. 4-25
Figure 4-33. Hangar S. 4-26
Figure 4-34. Space Station Processing Facility (SSPF). 4-26
Figure 4-35. Banana River Bridge. 4-27
Figure 4-36. Indian River Bridge. 4-27
Figure 4-37. Haulover Canal Bridge. 4-27
Figure 4-38. Location of contributing and noncontributing resources within the LC-39: Pad A Historic District. 4-30
Figure 4-39. Location of contributing and noncontributing resources within the LC-39: Pad B Historic District. 4-33
Figure 4-40. Location of contributing resources within the SLF Area Historic District. 4-34
Figure 4-41. Location of contributing resources within the Orbiter Processing Historic District. 4-35

RELEASED - Printed documents may be obsolete; validate prior to use.

List of Figures (cont.)

Figure 4-42. Location of contributing and noncontributing resources within the SRB Disassembly and Refurbishment Complex Historic District. 4-37
Figure 4-43. Location of contributing and noncontributing resources within the Hypergolic Maintenance and Checkout Area Historic District. 4-38
Figure 4-44. Location of contributing and noncontributing resources within the NASA KSC Railroad System Historic District. 4-40
Figure 4-45. Location of contributing and noncontributing resources within the NASA-owned CCAFS Industrial Area Historic District. 4-41
Figure 5-1. Management Areas of KSC, MINWR, CNS, and CCAFS. 5-4

List of Tables

Table 2-1. Summary of Precontact and Historic Contexts. 2-8
Table 3-1. Archaeological Surveys Conducted at KSC between 1970 and 2013. 3-3
Table 3-2. Summary of Results for the KSC-wide Archaeological Survey, 1990-1996. 3-10
Table 3-3. Mitigation Measures for Undertakings Initiated by NASA KSC between 2006 and 2014. 3-18
Table 4-1. Tabulation of Archaeological Site Type Components. 4-6
Table 4-2. Distribution of Archaeological Sites by Temporal/Cultural Affiliation. 4-7
Table 4-3. Distribution of Archaeological Sites by Evaluation Category. 4-8
Table 4-4. Contributing and Noncontributing Resources within KSC's Historic Districts. 4-28
Table 4-5. List of NHL-designated NASA-Controlled Facilities at CCAFS. 4-43
Table 5-1. NASA KSC Actions That Do Not Require Section 106 Consultation under the PA. 5-9
Table 5-2. NAGPRA Inventory for all KSC Archaeological Collections. 5-12
Table 5-3. Locations and Volume of Archaeological Collections from Sites at KSC. 5-13
Table 5-4. Summary of KSC Collections at SEAC. 5-14
Table 5-5. Comparison Summary of Site Condition Assessments. 5-24
Table 5-6. Protection Measures for Treatment and Mitigation of Archaeological Sites Recommended for Preservation and Protection. 5-26
Table 5-7. Summary of Site-Specific Recommendations by Category. 5-32

RELEASED - Printed documents may be obsolete; validate prior to use.

List of Acronyms and Abbreviations

ac	acre
ACHP	Advisory Council on Historic Preservation
ACI	Archaeological Consultants, Inc.
ACOE	Army Corps of Engineers
AFB	Air Force Base
AIRFA	American Indian Religious Freedom Act
APE	Area of Potential Effects
APU	Auxiliary Power Unit
ARPA	Archaeological Resources Protection Act
ATM	Apollo Telescope Mount
BAR	Bureau of Archaeological Research
B&W	Black and white
CCAFS	Cape Canaveral Air Force Station
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CIF	Central Instrumentation Facility
CITE	Cargo Integration Test Equipment
cm	centimeter
CNS	Canaveral National Seashore
COTR	Contracting Officer's Technical Representative
CRAS	Cultural Resources Assessment Survey
CRF	Canister Rotation Facility
CRM	Cultural Resource Management
CSLA	Commercial Space Launch Act
CVLC	Commercial Vehicle Launch Complex
CWA	Civil Works Administration
CxP	Constellation Program
DHR	Division of Historical Resources
DME	District Medical Examiner
DOI	Department of the Interior
DVD	Digital Video Disc
EA	Environmental Assessment
EC	Environmental Checklist
EDC	Engineering Documentation Center
EFR	Environmental Functional Review
EIS	Environmental Impact Statement
EMB	Environmental Management Branch
EMD	Environmental Management Division
EO	Executive Order
EPB	Environmental Program Branch
ESB	Engineering Support Building
ESE	Early Space Exploration
ET	External Tank
EUL	Enhanced Use Lease
FAS	Florida Archaeological Services
FDAHRM	Florida Division of Archives, History, and Records Management
FLMNH	Florida Museum of Natural History
FMSF	Florida Master Site File
FONSI	Finding of No Significant Impact
FPO	Federal Preservation Officer
FR	Federal Register

RELEASED - Printed documents may be obsolete; validate prior to use.

FS	Florida Statute; Field Specimen
FSS	Fixed Service Structure
ft	foot/feet
FTU	Florida Technological University
FWS	Fish and Wildlife Service
FY	Fiscal Year
GIS	Geographic Information System
GSA	General Services Administration
GSDO	Ground Systems Development and Operations
GSE	Ground Support Equipment
ha	hectare
HABS	Historic American Buildings Survey
HAER	Historic American Engineering Record
HALS	Historic American Landscape Survey
HMCA	Hypergolic Maintenance and Checkout Area
HMP	Hypergol Module Processing
HPO	Historic Preservation Officer
HPWG	Historic Preservation Working Group
HQ	Headquarters
ICBM	Intercontinental Ballistic Missile
ICRMP	Integrated Cultural Resource Management Plan
in	inch
IRAS	Indian River Archaeological Society
ISRP	International Space Research Park
ISS	International Space Station
ITAR	International Traffic in Arms Regulations
JA	Joint Area
KARS	Kennedy Athletic, Recreation and Social Park
KDP	Kennedy Documented Procedure
km	kilometer
KNPR	Kennedy NASA Procedural Requirement
KSC	Kennedy Space Center
LACB	Landing Aids Control Building
LASF	Launch Abort System Facility
LC	Launch Complex
LCC	Launch Control Center
LOC	Launch Operations Center
LOD	Launch Operations Directorate
LPS	Lightning Protection System
LUT	Launch Umbilical Tower
m	meter
MCC	Mission Control Center
MDD	Mate-Demate Device
MFL	Missile Firing Laboratory
mi	mile
MILA	Merritt Island Launch Area
MINWR	Merritt Island National Wildlife Refuge
MLP	Mobile Launcher Platform
MNI	Minimum Number of Individuals
MOA	Memorandum of Agreement
MOU	Memorandum of Understanding
MSFC	Marshall Space Flight Center
MSS	Mobile Service Structure

RELEASED - Printed documents may be obsolete; validate prior to use.

NAGPRA	Native American Graves Protection and Repatriation Act
NARA	National Archives and Records Administration
NASA	National Aeronautics and Space Administration
NASM	National Air and Space Museum
NEPA	National Environmental Policy Act
NETS	NASA Environmental Tracking System
NHL	National Historic Landmark
NHPA	National Historic Preservation Act
NPD	NASA Policy Directive
NPR	NASA Procedural Requirement
NPS	National Park Service
NRHP	National Register of Historic Places
O&C	Operations and Checkout
OMRF	Orbiter Modification and Refurbishment Facility
OMS	Orbital Maneuvering System
OPF	Orbiter Processing Facility
PA	Programmatic Agreement
PCR	Payload Changeout Room
PGHM	Payload Ground Handling Mechanism
PL	Public Law
POC	Point of Contact
PRF	Parachute Refurbishment Facility
RCS	Reaction Control System
REC	Record of Environmental Consideration
ROD	Record of Decision
RPB	Rotation/Processing Building
RPMS	Real Property Management System
RPO	Real Property Officer
RPSF	Rotation Processing Surge Facility
RSS	Rotating Service Structure
RTLS	Return-to-Launch-Site
SCA	Shuttle Carrier Aircraft
SEAC	Southeast Archaeological Center
SHPO	State Historic Preservation Officer
SLF	Shuttle Landing Facility
SLS	Space Launch System
SOP	Standard Operating Procedure
SOW	Statement of Work; Scope of Work
SRB	Solid Rocket Booster
SSMEPF	Space Shuttle Main Engine Processing Facility
SSP	Space Shuttle Program
THPO	Tribal Historic Preservation Officer
TLS	Terrestrial Laser Scanning
TPSF	Thermal Protection System Facility
USAF	United States Air Force
USDA	U.S. Department of Agriculture
USF	University of South Florida
USGS	U.S. Geological Survey
VAB	Vehicle Assembly Building
ZAP	Zone of Archaeological Potential

RELEASED - Printed documents may be obsolete; validate prior to use.

Chapter 1.0 INTRODUCTION

1.1 GOALS AND OBJECTIVES

The National Aeronautics and Space Administration (NASA) has stewardship responsibility for managing the cultural resources on NASA-owned lands at the Kennedy Space Center (KSC), as well as NASA-owned historic facilities located within the Cape Canaveral Air Force Station (CCAFS). To this end, KSC developed an Integrated Cultural Resource Management Plan (ICRMP) that reflects the Agency's commitment to the protection of its significant archaeological sites and historic facilities. The ICRMP was originally prepared in 1998, and updated in 2001 and 2009, by the KSC Environmental Management Branch (EMB). This update of the ICRMP incorporates recent additions and revisions to federal legislation, as well as NASA initiatives, policy and guidance, current as of 2014. It also includes the most recent database for archaeological sites and historic resources, reflecting work completed through October 2014. Standard operating procedures (SOPs) for routine actions and resource management are also provided.

1.1.1 Mission Statement

KSC is the Nation's premier launch complex for sending humans and payloads to space. It is the lead Center within NASA for the development of launch procedures, technology, and facilities. In addition to its history of manned space vehicle launch and landing, KSC also launches celestial, solar, and planetary probes, as well as earth resources, meteorological, and communications satellites. In the years ahead, KSC will transform from a government and program-focused, single-user launch complex to a more capability centered and multi-user spaceport. NASA's mission, as established by the Office of the President and directed from Congress, is to expand commercial uses of space and the space industry. KSC's new mission is to enable government and commercial space access providers with facilities, an experienced workforce, and the knowledge necessary to support existing and new space programs. Developing the world's premier spaceport to meet government and commercial space industry requires NASA and KSC to adopt new ways of doing business, including forming partnerships with industry, the State of Florida, and other public and private entities.

The future of KSC lies in the Launch Services Program, Commercial Crew Program, International Space Station (ISS), other exploration programs and partnerships developed with non-NASA entities. Ground Systems Development and Operations (GSDO) will align the KSC infrastructure to support the needs of these programs to process and launch government and commercially provided vehicles and spacecraft. The Shuttle Landing Facility (SLF) and existing structures in the Launch Complex (LC) 39 area are being repaired and/or renovated. KSC will expand its spaceport capabilities for processing, launch, and recovery of horizontally and vertically launched rocket-powered vehicles. Some of the proposed activities and initiatives will require construction and renovation of facilities on KSC lands that will be leased or otherwise permitted for use by commercial or outside governmental entities. KSC's mission is to safely manage, develop, integrate, and sustain space systems through partnerships that enable innovative, diverse access to space and inspire the Nation's future explorers (KSC-PLN-8810.1).

It is the goal of KSC to balance historic preservation considerations with the Agency's mission and mandates and to avoid conflict with ongoing operational requirements. Historic preservation is an integral part of KSC's environmental mission. Consistent with Section 110 of the National Historic Preservation Act (NHPA) this ICRMP, as developed and implemented, encourages a proactive approach by KSC managers and their recognition of the cultural and scientific value of the cultural resources that are under their jurisdiction.

1.1.2 Statement of Purpose

The goal of this ICRMP is to formally establish and document the means by which consideration of cultural resources is integrated into the decision-making process for activities at KSC. This document provides an inventory of significant cultural resources and a plan of action to identify, assess, manage, preserve, and protect those resources. It also includes a guide for impact analysis review and a set of SOPs for ongoing cultural resource management (CRM) activities.

The purpose of this ICRMP is to provide KSC with a programmatic basis for compliance with federal historic preservation laws, as discussed in the following section. The document has been prepared in accordance with the Secretary of the Interior's

RELEASED - Printed documents may be obsolete; validate prior to use.

Standards and Guidelines for Preservation Planning, the Section 110 Guidelines and the recommendations and conclusions contained in the Advisory Council on Historic Preservation (ACHP) 1991 report to Congress entitled Balancing Historic Preservation Needs with the Operation of Highly Technical or Scientific Facilities. The ICRMP is also consistent with KSC's Environmental Policy Statement (2014), which promulgates compliance "*through a proactive, systematic approach that integrates environmental management system elements into KSC operations and practices to comply with all environmental laws, regulations, policies, Executive Orders, and NASA environmental directives, procedures, and requirements.*"

1.2 ORGANIZATION OF THE ICRMP

The ICRMP, a training and reference tool for KSC managers and other personnel, is organized into nine sections:

- **Chapter 1** introduces the legislative foundations and NASA policies that underlie KSC's CRM program. It also includes a look at Section 106 of the NHPA and the steps of the review process mandated by this key federal legislation. The integration of Section 106 and the National Environmental Policy Act (NEPA) is also featured, as are current NASA policies and directives.

- **Chapter 2** introduces the environment, prehistory (precontact period), and history of the KSC.

- **Chapter 3** contains a summary of previous KSC CRM investigations/surveys, accomplishments, mitigation measures, agreements, and correspondence with the Florida State Historic Preervation Officer (SHPO) and NASA.

- **Chapter 4** provides a description of the archaeological database and the significant NASA-owned historic properties at KSC.

- **Chapter 5** addresses ongoing compliance with federal statutory authorities, as well as issues regarding CRM administrative responsibilities and long-range planning.

- **Chapter 6** contains a set of SOPs for a variety of CRM actions, including project review, archaeological site management, mitigation measures for significant historic properties, responses to inadvertent discoveries, archaeological collections management, and consultation with Native Americans and the public, among others.

- **Chapter 7** provides a bibliography and list of references cited.

- **Chapter 8** facilitates direct linkage via the Internet to key federal laws and regulations, as well as miscellaneous guidance documents**.**

- **Chapter 9** consists of a set of appendices that contains a glossary of key terms (Appendix A), the precontact and historic context for KSC, lists of archaeological sites and significant historic properties.

1.3 STATUTORY AUTHORITIES

1.3.1 Introduction

Beginning over one hundred years ago with the passage of the Antiquities Act of 1906, a number of federal laws have been promulgated, which govern the management of cultural resources on federal and Native American tribal lands. Interestingly, none of these federal laws specifically define the term **cultural resource**. In its broadest use, cultural resources "*refer to all elements of the physical and social environment that are thought by anybody – a community, a tribe, an interest group – to have cultural value*" (King 2003:11). Thus, cultural resources, also referred to as **heritage resources**, include not only tangible features and remains, such as historic buildings and archaeological sites, but also humanly-modified landscapes and oral traditions. Viewed more narrowly within the context of specific laws, such as the NHPA, cultural resources are synonymous with **historic properties**, that is, districts, sites, buildings, structures and objects included in or eligible for the National Register of Historic Places (NRHP). **Native American cultural items** (i.e., human remains, associated and unassociated funerary objects, sacred objects, and cultural patrimony), as well as **Indian sacred sites**, as defined in the Native American Graves Protection and Repatriation Act (NAGPRA) and Executive Order 13007, respectively, are other types of cultural resources that fall within the regulatory framework of CRM.

RELEASED - Printed documents may be obsolete; validate prior to use.

Principal federal legislation governing the management of cultural resources on federal and tribal lands includes:

- Antiquities Act of 1906
- Historic Sites Act of 1935
- National Historic Preservation Act of 1966, as amended
- National Environmental Policy Act of 1969, as amended
- Executive Order 11593: Protection and Enhancement of the Cultural Environment (1971)
- Archaeological and Historic Preservation Act of 1974
- American Indian Religious Freedom Act (AIRFA) of 1978
- Archaeological Resources Protection Act (ARPA) of 1979
- Native American Graves Protection and Repatriation Act of 1990
- Executive Order 13007: Indian Sacred Sites (1996)
- Executive Order 13175: Consultation and Coordination with Indian Tribal Governments (2000)
- Executive Order 13287, Preserve America (2003)

Chapter 267 of the Florida Statutes (F.S.) contains legislation, which parallels the federal requirements of the NHPA on the state level. Regulations that implement the federal laws are promulgated and published in the Code of Federal Regulations (CFR). Those pertinent to CRM are listed in **Exhibit 1-1** at the end of this chapter. A summary of relevant federal and state legislation follows. Hyperlinks to the regulations are included.

1.3.2 National Historic Preservation Act (NHPA) of 1966 (Public Law [PL amended] 89-665), as amended

The NHPA of 1966, as amended, is the keystone of federal historic preservation law. **Section 101** establishes the NRHP and authorizes the Secretary of the Interior to expand and maintain it. Section 101(d)(6)(A) clarifies that properties of traditional religious and cultural significance to an Indian tribe or Native Hawaiian organization may be eligible for the NRHP. Section 101(d)(6)(B) requires federal agencies to consult with any Indian tribes or Native Hawaiian organizations that attach religious and cultural significance to properties of "traditional religious and cultural importance" during the Section 106 process. It is the federal agency's responsibility to make a "**reasonable and good faith effort**" to identify the appropriate tribes to be consulted. Consultation with a Native American tribe must recognize the "government to government" relationship that exists between the federal government and federally-recognized tribes and should be respectful of tribal sovereignty as stated in 36 CFR Part 800.2(c)(2).

Section 106 is among the fundamental provisions of the Act, which requires all federal agencies to take into consideration the effect of federally assisted, licensed or permitted projects on cultural resources that are listed, or eligible for listing, in the NRHP. Listing in the National Register, or meeting the criteria of eligibility, is a basic prerequisite for a cultural resource to benefit from protection and assistance under Section 106. The National Register is administered by the Secretary of the Interior through the National Park Service (NPS). Section 106 of the NHPA also requires that the **ACHP**, a body of Presidential appointees charged with addressing historic preservation issues, be **afforded an opportunity to comment on such effects**. The process for accomplishing the provisions of Section 106 is contained in the implementing regulations 36 CFR Part 800, issued by the ACHP. The multi-step Section 106 process is elaborated in Section 1.4. In recognition of the fact that not all significant archaeological and historic resources may have been identified and recorded within a project area of potential effects (APE), 36 CFR Part 800.4(b) requires that federal agencies make "**a reasonable and good faith effort**" to identify *any* cultural resources (including unrecorded and previously recorded properties) that may be affected by their undertakings, and evaluate the eligibility of these resources for listing in the NRHP.

Section 110 of the NHPA (as amended in 1992) obligates federal agencies to establish a historic preservation program for the **identification, evaluation,** and **nomination** to the NRHP of historic properties under their jurisdiction, and to ensure that such properties are managed and maintained in a way that considers their historic, archaeological, architectural, and cultural values. Section 110(a) requires federal agencies to give priority to **the use of historic properties** for agency purposes. Section 110(a)(2)(D) requires that the federal agency's

RELEASED - Printed documents may be obsolete; validate prior to use.

preservation-related activities are carried out in consultation with other federal, state, and local agencies, Indian tribes, Native Hawaiians, and other stakeholders, including the private sector.

Section 110(b) mandates that federal agencies document historic properties that may be destroyed or altered as a result of federal actions or assistance. It also calls for such records to be deposited in the Library of Congress or other designated repository for "future use and reference." Section 110(d) calls for agencies to integrate historic preservation concerns into their plans and programs and Section 110(f) addresses impacts to National Historic Landmarks (NHLs).

Section 111 of the NHPA addresses the **lease or exchange of historic properties** owned by federal agencies, provided such actions "will adequately insure the preservation of the historic property" (Section 111(a)). Under Section 111(b), the proceeds of the lease may be used by the agency to defray the costs of administering and maintaining its historic properties. **Section 112** addresses both **professional standards** for agency personnel and contractors responsible for historic resources (Section 112(a)(1)(A)), as well as **records** and **data management** (Section 112(a)(2)). **Confidentiality** regarding the locations of historic resources is addressed in **Section 304**, which stipulates that disclosure shall be withheld from the public if it has the potential to cause "significant invasion of privacy," harm to the historic resources, or "impede the use of a traditional religious site by practitioners."

When KSC manages undertakings that are located overseas, then **Section 402** of the NHPA applies. Congress added this provision in 1980 to govern federal undertakings outside the U.S. This section requires that such undertakings take into account the adverse effects on sites inscribed on the World Heritage List or on the foreign nation's equivalent of the NRHP for the purpose of avoiding or mitigating adverse effects.

The corresponding regulations to the NHPA for Section 106, **36 CFR Part 800** (Protection of Historic Properties) currently incorporate amendments effective August 5, 2004. Subpart B of the regulations defines how federal agencies meet the statutory responsibilities in the Section 106 process and how the steps of this process can be coordinated with reviews under other federal laws, including NEPA, NAGPRA, AIRFA, and ARPA. **Section 800.8** encourages federal agencies to coordinate compliance with Section 106 with steps taken to meet the requirements of NEPA. The regulations underscore the need to initiate consultation early in the Section 106 process and to consider a broad range of alternatives in project planning. Section 800.8(c) permits substitution of NEPA analyses and documents for standard Section 106 review provided that certain conditions are met.

Section 800.9 of the regulations empowers the Council (ACHP) to review federal agency compliance with the Section 106 process, including an evaluation of the agency's policies, procedures and actions, and the provision of recommended actions to improve the process (Section 800.9(d)(2)). As stated in Section 800.9 (b) **when an agency official is found to have failed to complete the requirements of Section 106 prior to the approval of an undertaking, "the Council's opportunity to comment may be foreclosed."**

In accordance with **Section 800.10**, in the case of **NHLs**, the agency official shall request Council participation in any consultation to resolve adverse effects, and shall also **notify and invite the Secretary of the Interior to participate in the consultation**.

1.3.3 National Environmental Policy Act (NEPA) of 1969 (PL 91-190), as amended

The NEPA of 1969 requires consideration of the environmental impacts of federal actions, including impacts on cultural resources. Public involvement in the decision-making process is an important tenet of NEPA. The Act declares that it shall be the continuing responsibility of the federal government to "preserve important historic, cultural, and natural aspects of our national heritage." Consequently, Section 102(c) of NEPA requires that an Environmental Impact Statement (EIS) be prepared when federal actions will significantly affect the quality of the human environment. Preparation of an Environmental Assessment (EA) may precede preparation of an EIS. The EA will either support a Finding of No Significant Impact (FONSI) or will document the need for an EIS. When an EIS is prepared, agencies are required to identify an environmentally preferable alternative in the Record of Decision (ROD).

RELEASED - Printed documents may be obsolete; validate prior to use.

Compliance with NEPA can and should be coordinated with Section 106 review, although compliance with one statute does not substitute for compliance with the other. The regulations of the Council on Environmental Quality (CEQ), which implement NEPA (40 CFR Part 1500-1508), encourage agencies to integrate NEPA and NHPA compliance. In 40 CFR Part 1508.8 the CEQs implementing regulations define "**effects**" or "**impacts**" to include "ecological . . . aesthetic, historic, cultural, economic, social or health, whether direct, indirect, or cumulative." (40 CFR 1508.8).

1.3.4 Executive Order (EO) 11593: Protection and Enhancement of the Cultural Environment

EO 11593, signed by President Richard Nixon in 1971, requires all federal agencies to **identify** archaeological and historic properties under their jurisdiction, **nominate** eligible properties to the NRHP, and to "*assure that any federally owned property that might qualify for nomination is not inadvertently transferred, sold, demolished, or substantially altered*." It also calls for the **complete documentation** of any NRHP eligible site or property that will be demolished or substantially altered as a result of a federal undertaking.

1.3.5 American Indian Religious Freedom Act (AIRFA) of 1978 (PL 95-341)

The AIRFA of 1978 establishes a federal policy for the protection of the rights of Native American tribes to the free exercise of their religion, including access to sacred sites, and requires federal agencies to evaluate their programs to accommodate this policy. AIRFA also has the effect of requiring serious efforts to include Native Americans in the consultation process under Section 106. Amendments to Section 101 of the NHPA in 1992 strengthened the interface with this Act by declaring that under Section 106 a federal agency "**shall consult with any Indian tribe or Native Hawaiian organization that attaches religious and cultural significance to properties**" (Section 101(d)(6)(B)).

1.3.6 Archaeological Resources Protection Act (ARPA) of 1979 (PL 96-95)

The ARPA of 1979 prohibits the unauthorized excavation of archaeological resources on federal and Native American land without a permit issued by the relevant land management agency. It also prohibits the sale, receipt, and interstate transportation of archaeological resources obtained illegally (without permits) from public or Native American land, and establishes substantial civil and criminal penalties for violations. ARPA prescribes standards that must be met by the permit applicant. Where both ARPA and Section 106 of the NHPA apply (e.g., where data recovery is proposed on federal land), it is important to coordinate ARPA and Section 106 compliance. **43 Part CFR 7** contains the regulations implementing the provisions of the ARPA and establishes uniform definitions, standards, and procedures to be followed by all federal land managers in protecting archaeological resources located on public and Indian lands. **Section 7.12** of the regulations notes that issuance of an ARPA permit does not constitute an undertaking requiring compliance with Section 106. However, the mere issuance of such a permit does not excuse the federal land manager from compliance with Section 106 where otherwise required.

Section 9 of ARPA provides additional **protections** for archaeological sites by not making available to the public information on the nature and location of such resources on federal and Indian lands when disclosure will create a potential for harm. It also exempts information on archaeological resources from **Freedom of Information Act** requests.

1.3.7 Native American Graves Protection and Repatriation Act (NAGPRA) of 1990 (PL 101-601)

The NAGPRA prohibits the intentional removal of Native American cultural items from federal or tribal lands except under an ARPA permit and in consultation with the appropriate Native American groups. It also requires federal agencies and museums receiving federal funds to inventory Native American human remains and associated funerary objects and develop written summaries for unassociated funerary objects, sacred objects, and objects of cultural patrimony that are in the collections they own or control. Another principal intention of the Act is the protection, on federal and tribal land, of Native American graves and other cultural items. NAGPRA contains provisions for the **return (repatriation) of human remains and other cultural items** held by federal agencies and museums that receive federal support to the appropriate Native American groups or descendants, upon their request. The law also stipulates penalties for the illegal trafficking in Native American human remains and cultural items. NAGPRA is implemented by the regulations contained in 43 CFR Part 10.

RELEASED - Printed documents may be obsolete; validate prior to use.

1.3.8 EO 13007: Indian Sacred Sites (1996) and EO 13175: Consultation and Coordination with Indian Tribal Governments (2000)

EO 13007, issued by President William J. Clinton on May 24, 1996, requires federal agencies to **protect Indian sacred sites** (see Glossary) by avoiding adverse effects to the physical integrity of such sites. It also accommodates access to and ceremonial use of Indian sacred sites by Indian religions practitioners, and, where appropriate, requires federal agencies to maintain the **confidentiality** of information on such sites. The Section 106 review process can beused to ensure that the requirements of EO 13007 are fulfilled when resolving adverse effects in accordance with ACHP guidance.

EO 13175, signed by President Clinton in 2000, affirms and strengthens the federal government's recognition of tribal sovereignty and self-determination, and strengthens the government-to-government relationship between Native American tribes and the U.S. government. In accordance with Section 9 of EO 13175, the 1998 EO 13084 of the same name was revoked when EO 13175 went into effect. In September 2004, President George W. Bush's Memorandum "Government-to-Government Relationship with Tribal Governments" reaffirmed the policy set forth in EO 13175.

A Presidential Memorandum for the Heads of Executive Departments and Agencies on the subject of Tribal Consultation was issued by President Barack Obama on November 5, 2009. The memorandum stated his Administration is "committed to regular and meaningful consultation and collaboration with tribal officials in policy decisions that have tribal implications including, as an initial step, through complete and consistent implementation of EO 13175." Each agency head was directed to submit to the Director of the Office of Management and Budget (OMB), a detailed plan of actions the agency will take to implement the policies and directives of EO 13175, along with annual progress reports on the status of each action included in the plan.

1.3.9 EO 13287: Preserve America

EO 13287, signed by President George W. Bush on May 3, 2003, establishes the federal government's leadership role in preserving America's heritage through promotion of the **protection** and continued **use** of **historic properties** owned by the federal government. It advocates intergovernmental cooperation, as well as public-private partnerships to promote local economic development. **Section 3** of EO 13287 requires federal agencies with real property management responsibilities "to prepare an assessment of the current status of its inventory of historic properties required by Section 110(a)(2) of the NHPA, the general **condition and management** needs of such properties, and the steps underway or planned to meet these management needs." The Section 3 Report includes the evaluation of the suitability of the historic properties to contribute to community economic development, including **heritage tourism**. Beginning in September 2005, federal agencies were required to submit triennial progress reports to the ACHP. Guidelines for preparing Section 3 progress reports were prepared by the ACHP in 2003, and revised in August 2007.

1.3.10 Chapter 267, F.S. (Florida Historical Resources Act)

Chapter 267, F.S. is the principal state law regarding the **protection** of archaeological and historical resources, and it contains requirements similar to those of the Federal NHPA. The Act declares it to be state policy to protect and preserve archaeological and historical sites that "have scientific or historical value or are of interest to the public" (Chap. 267.061(1)(a)). The Florida DHR is charged with administering the Act and, on behalf of the State, with implementing the provisions of the NHPA. The DHR is responsible for cooperating with federal and state agencies to promote and ensure the preservation of archaeological and historical resources and is directed to assist each level of government in carrying out its respective preservation programs. The Act requires that the DHR be given a reasonable opportunity to comment on the effects of any proposed state or state-assisted undertaking on any historic property and outlines a process for doing so (Chap. 267.0615). Chapter 267.135 provides for the non-disclosure of archaeological site locations. Improvements to state-owned roads and/or bridges located on NASA land are examples of undertakings covered by both state and federal laws.

1.4 THE SECTION 106 COMPLIANCE PROCESS

The Section 106 process is a review procedure established by Congress in 1966. It is implemented

RELEASED - Printed documents may be obsolete; validate prior to use.

by federal regulations entitled "Protection of Historic Properties," also known as 36 CFR Part 800 (last amendments effective August 5, 2004). Section 106 represents the principal federal review process that looks at how historic properties are affected by projects funded by or under the jurisdiction of federal agencies. In essence, Section 106 requires federal agencies to: (1) consider the effects their actions (or actions they may assist, permit, or license) may have on NRHP-listed or eligible historic properties and (2) seek comments from the ACHP (Council) by giving them a reasonable opportunity to comment.

Section 106 applies to: (1) properties that have been listed in the NRHP, (2) properties that have been determined eligible for inclusion in the NRHP, and (3) properties that may be eligible, but have not yet been discovered and evaluated. This is critical to KSC since it is the responsibility of the federal agency involved to discover historic properties and ascertain their potential NRHP eligibility following procedures outlined in the ACHP and NPS regulations, **36 CFR Part 800** and **48 FR 44716**, respectively. KSC is ultimately responsible for coordination and consultation with the Florida SHPO and the ACHP.

Section 106 of the NHPA (as amended) states that: *"The head of any Federal agency having direct or indirect jurisdiction over a proposed Federal or federally assisted undertaking in any State and the head of any Federal department or independent agency having authority to license any undertaking shall, prior to the approval of the expenditure of any Federal funds on the undertaking or prior to the issuance of any license, as the case may be, take into account the effect of the undertaking on any district, site, building, structure, or object that is included in or eligible for inclusion in the NRHP. The head of any such Federal agency shall afford the Advisory Council on Historic Preservation established under Title II of this Act a reasonable opportunity to comment with regard to such undertaking."*

Section 106 affords the Nation an opportunity to preserve the Nation's heritage in many different ways. Adherence to the Section 106 process requires full consideration of preservation values by federal agencies compared with the projected benefits of the completed undertaking, costs, and other factors. As a result, final actions performed by federal agencies can range from **avoidance to unmitigated loss of property**, as long as consideration of the effects and available options are carefully evaluated.

The revised regulations outline the process that each agency should follow to conduct its Section 106 compliance and who the relevant parties are in the process as well as their roles. The regulations also outline the circumstances in which the ACHP will likely choose to participate in the process. Most importantly, the regulations carefully delineate the consultation process between the federal agency and other parties with an interest in the effects of an undertaking (36 CFR Part 800.2(a)(4)). Such consultations should be appropriate to the scale of the undertaking and the scope of federal involvement. Consulting parties in the Section 106 process include the SHPO, THPOs or tribal historic preservation representatives, the ACHP, representatives of local governments, and the public.

Under 800.14, agencies may execute Programmatic Agreements or other Program Alternatives. A Programmatic Agreement (PA) is negotiated between the ACHP, SHPO/THPO, and others to govern the implementation of a particular program or to resolve adverse effects. KSC executed a PA in accordance with 36 CFR Part 800.14(b) for the Management of Historic Properties (mainly for facility preservation) with the SHPO and ACHP on May 9, 2009, which has streamlined the Section 106 review process. KSC's flow chart, KDP-P-1733, is found in **Figure 1-1**. KSC's PA, described in Section 1.4.6, is subject to annual review, but can continue in full force until it is amended or terminated.

The Section 106 review process is divided into four steps and a basic flow chart, developed by the SHPO, is presented in **Figure 1-2**. Those four steps consist of (1) Initiate Section 106 Process, (2) Identify Historic Properties, (3) Assess Adverse Effects, and (4) Resolve Adverse Effects.

The NASA Headquarters Guidance for Implementation of NASA Cultural Resources Management Requirements includes a Section 106 checklist summarizing the tasks to be completed for each of the four steps. The checklist can be found in **Exhibit 1-2**.

RELEASED - Printed documents may be obsolete; validate prior to use.

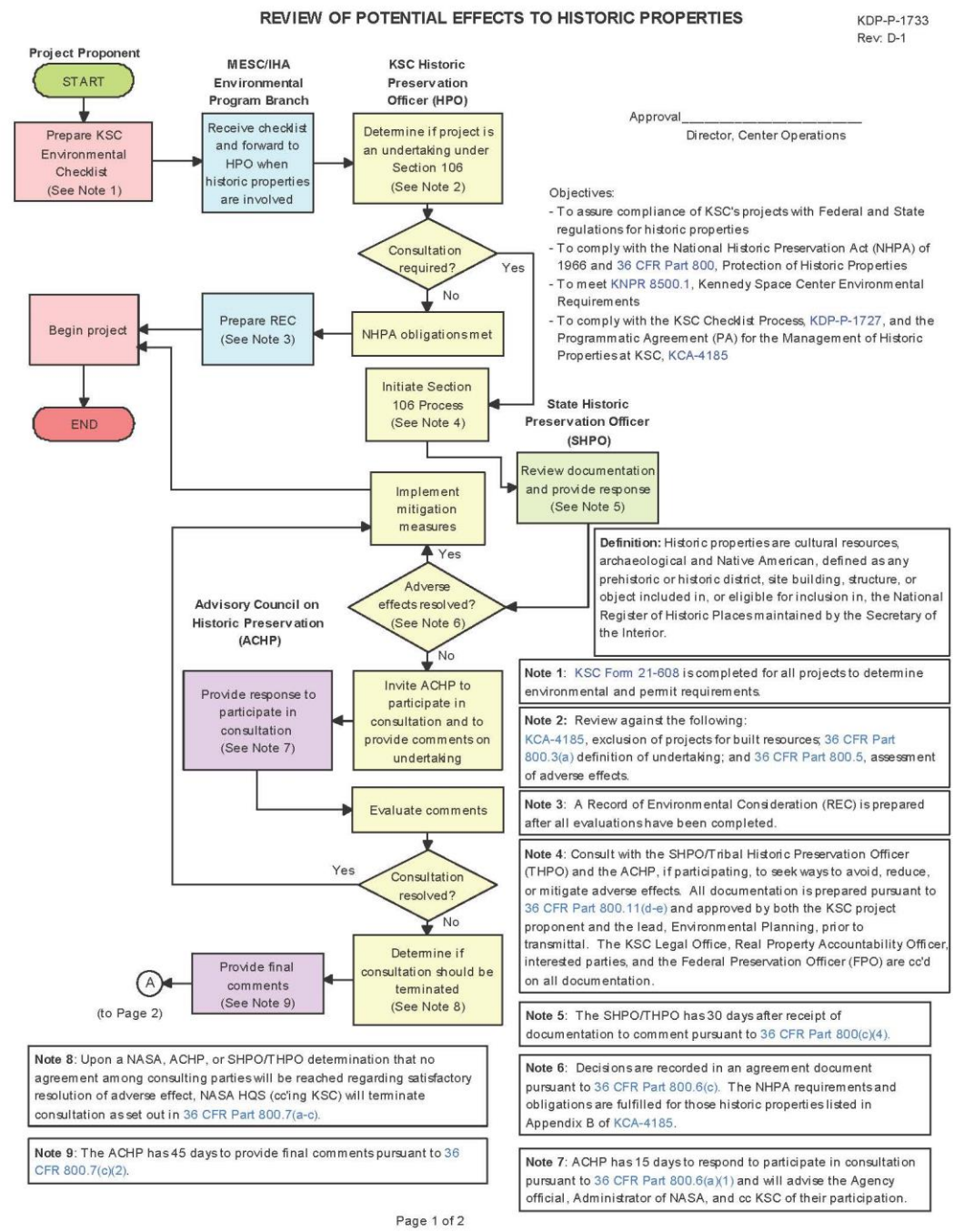


Figure 1-1. *Review of Potential Effects to Historic Properties Flow Chart (KDP-P-1733).*

RELEASED - Printed documents may be obsolete; validate prior to use.

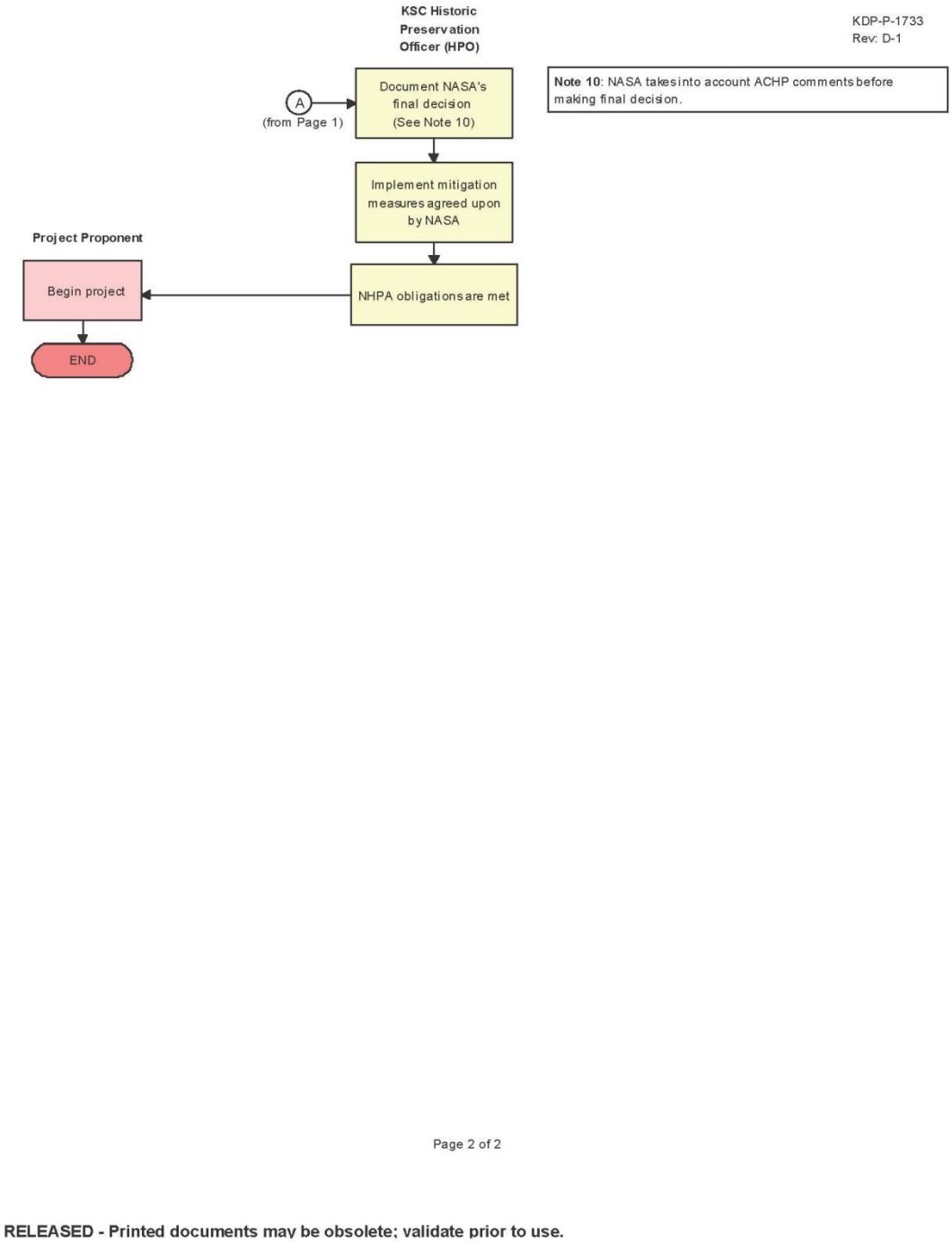


Figure 1-1. *Review of Potential Effects to Historic Properties Flow Chart, KDP-P-1733 (cont.).*

RELEASED - Printed documents may be obsolete; validate prior to use.

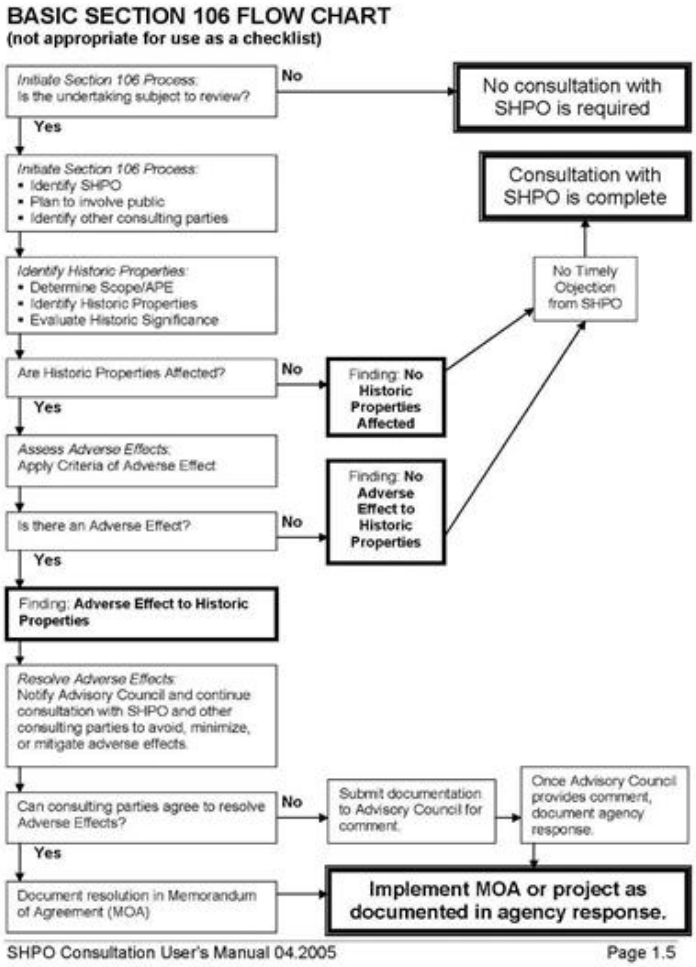


Figure 1-2. *Basic Section 106 Flow Chart.*

1.4.1 The 4-Step Section 106 Review Process

Step 1: Initiate Section 106 Process
The traditional Section 106 process is initiated by determining whether the proposed action is an undertaking as defined in 36 CFR Part 800.16(y) and, if so, whether it is the type of activity that has the potential to cause effects on historic properties. There are a number of other laws to consider when carrying out the duties of Section 106, such as NEPA, AIRFA, and NAGPRA. 36 CFR Part 800.3(b) specifically encourages coordination of the Section 106 responsibilities with the steps taken to satisfy other historic preservation and environmental laws.

Step 2: Identify Historic Properties
All historic properties must be identified with the area of potential effect (APE). The term **historic properties is defined as any property that is listed or is eligible for listing in the NRHP, and thus, includes archaeological sites as well as historic structures, objects and districts, engineering**

RELEASED - Printed documents may be obsolete; validate prior to use.

features, and other cultural properties such as cemeteries and historic landscapes. NRHP eligible properties are identified and evaluated by means of a Cultural Resource Assessment Survey (CRAS) or an Architectural Survey and Evaluation.

In most cases, all parties must come to an agreement on whether or not a property is eligible for inclusion in the NRHP. If all do not agree, or if the ACHP or the Secretary of the Interior so request, a formal determination of eligibility from the **Keeper of the National Register** is obtained. The Keeper acts on behalf of the Secretary of the Interior in accordance with applicable NPS regulations.

If no NRHP-listed or eligible properties are present or affected within the APE, a finding of **No Historic Properties Affected** is determined. If NRHP-listed or eligible properties are present within the established APE that may be affected by the undertaking, then KSC moves on to the next step to assess the potential effects of the undertaking.

Step 3: Assess Adverse Effects
The evaluation of effects is based on application of the **Criteria of Adverse Effect** prior to making a formal finding of **No Adverse Effect** or **Adverse Effect**. The Criteria of Adverse Effect are found in the ACHP's regulations at 36 CFR Part 800.5(a)(1).

"When the undertaking may directly or indirectly alter characteristics of a historic property that qualify the property for inclusion in the NRHP 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 NRHP. Adverse effects may include reasonably foreseeable effects caused by an undertaking that may occur later in time, be farther removed in distance or be cumulative."

It is an **Adverse Effect** when the integrity of the characteristics that qualifies a property for inclusion in the NRHP is diminished by the federal undertaking. Numerous situations may cause different types of adverse effects. The project may physically impact the resource by taking all or part of its property. The project may also impact the resource, both directly and indirectly, by affecting visual and/or aesthetic qualities (including views to or from the property), noise levels, landscaping, use of the property, air quality, vibration levels, and access, among others.

Examples of Adverse Effects under 36 CFR Part 800.5(a)(2) are:

(i) Physical destruction 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 Treatment of Historic Properties (36 CFR Part 68) and applicable guidelines.
(iii) Removal of a 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, audible, or atmospheric 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.
(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.

In some cases, a finding of **No Adverse Effect** is determined when the project's effects are not judged to be harmful to those characteristics that qualify the property for inclusion in the NRHP pursuant to 36 CFR Part 800.5(a)(1). For example, the Orbiter Processing Facility (OPF) is eligible under NRHP Criterion C in the area of Engineering for its specialized equipment rather than for the design or style of the building, therefore, alterations to the exterior façade would not cause an adverse effect. However, since they are character-defining features, removal of the interior work platforms would be considered an adverse effect.

Findings of No Adverse Effect require notification and documentation be presented to the SHPO and consulting parties. The required documentation, as specified in 36 CFR Part 800.11(e), shall include:

RELEASED - Printed documents may be obsolete; validate prior to use.

1. *A description of the undertaking, specifying the federal involvement, and its area of potential effects, including photographs, maps, and drawings, as necessary.*
2. *A description of the steps taken to identify historic properties.*
3. *A description of the affected historic properties, including information on the characteristics that qualify them for the National Register.*
4. *A description of the undertaking's effects on historic properties.*
5. *An explanation of why the criteria of adverse effect were found applicable or inapplicable, including any conditions or future actions to avoid, minimize or mitigate adverse effects.*
6. *Copies of summaries of any views or comments provided by consulting parties and the public.*
7. *A schedule and cost of activities.*

Step 4: Resolve Adverse Effects
When it has been determined that a proposed undertaking will have an Adverse Effect on an NRHP-listed or eligible property, consultation is required with the SHPO/THPO, ACHP, and others who may include Native American tribes, local governments, permit or license applicants, and members of the public. Consultation brings together the principal parties to consider ways to **avoid**, **reduce**, or **mitigate** the adverse effects of the undertaking on historic properties. Finally, development of an agreement document signed by all parties will be prepared unless the agency has a PA in place. The process outlined in 36 CFR Part 800.6 explains when agreement can be reached. Part 800.7 explains the process if there is failure to resolve adverse effects such as between consulting parties, SHPO/THPO or ACHP.

1.4.2 Section 106 Consultation Process

As part of its initial planning, consultation must be initiated with the SHPO and appropriate representatives of federally-recognized Native American tribes, as well as identify other potential consulting parties. These other parties may include local (city or county) governments, local historic preservation boards, commissions, or societies. Besides the principal parties, the public is afforded the opportunity to receive information on the project and to express their views.

The **SHPO has 30 days from receipt of the complete documentation to review the finding(s).** Failure to respond indicates that the project can move forward pursuant to 36 CFR Part 800.5(c)(1). Typically, the SHPO will respond by letter in a timely fashion, but a phone call or email to verify concurrence or non-concurrence is recommended.

In the event that the SHPO or any consulting party disagrees within the 30-day review period, they shall specify the reasons for disagreeing with the finding. Consultation is then between the parties to resolve the disagreement or request the ACHP review the finding pursuant to 36 CFR Part 800.5(c)(3). If the ACHP is asked to review the finding, the agency's official will be notified of the determination as to whether the adverse effect criteria was applied correctly within 15 days of receiving the documented finding.

Occasionally the SHPO may withdraw from consultation without intending to terminate the process. It is important that such a withdrawal is documented so as not to inadvertently terminate consultation, allowing the agency and the ACHP to proceed.

In addition, the ACHP is invited to participate in the consultation process when any of the circumstances in 36 CFR Part 800.6(a)(1)(i) exist:

(A) *The agency official wants the Council to participate.*
(B) *The undertaking has an adverse effect upon a National Historic Landmark.*
(C) *A programmatic agreement under 36 CFR Part 800.14(b) will be prepared.*
(D) *Has a substantial impact to important historic properties (e.g., properties possessing a national level of significance or of a rare property type).*
(E) *Presents important questions of policy or interpretation.*
(F) *Has the potential for presenting procedural problems.*
(G) *Presents issues of concern to Indian tribes or Native Hawaiian organizations.*

Note that the SHPO, a Native American tribe, or any other consulting party may at any time independently request the ACHP to participate in the consultation.

The **ACHP has 15 days** within receipt of a request to determine whether it will participate. If the ACHP decides to participate in the consultation process, the ACHP must notify the agency official and consulting parties. This is intended to keep the policy level of

RELEASED - Printed documents may be obsolete; validate prior to use.

the federal agency informed of those cases that the ACHP has determined present issues significant enough to warrant its involvement.

A successful consultation accommodates the needs of the agency's undertaking and the integrity of the historic property in a way that best serves the public interest and ideally promotes the protection and enhancement of the historic resource.

1.4.3 Consideration of Alternatives and Mitigation Measures

The consultation process gives priority to consideration of alternatives to accomplishing the agency's goals without unacceptably damaging the affected historic property. This may include consideration of avoiding or minimizing effects either through alternate sites, alternate undertakings, and alternate designs, as well as choosing not to proceed. If the consulting parties find that the consideration of alternatives does not result in a viable solution that would best serve the public interest, they can proceed to a discussion and evaluation of mitigative measures. Mitigation refers to actions that reduce or compensate for the damage an undertaking may have on a NRHP-listed or eligible property.

In some cases, it may be agreed that there are no mitigative measures and that the adverse effects must be accepted in the public interest. On the other hand, the consulting parties may occasionally not reach any sort of agreement. In this case, the SHPO, or the ACHP may decide to **terminate the consultation**. If this happens, the agency requests the comments of the ACHP pursuant to Section 800.7(c) and notifies all other consulting parties of its request. The ACHP then has **45 days** to render comment.

1.4.4 Preparation of Section 106 Documentation

As a general rule, effects are discussed in a Section 106 Consultation Case Report (Case Report) that is used to provide the concerned parties (SHPO, ACHP, NPS [for NHLs] and others) with all pertinent information to assess effects. Components of the Case Report are described in Module 3 of the DHR's Cultural Resources Management Standards & Operational Manual. A Coordination Letter rather than a Case Report to provide information on effects of an undertaking is acceptable.

The Coordination letter presents all available documentation pertaining to the significance and characteristics of the NRHP-listed or eligible property as well as a discussion of any and all effects that the proposed undertaking may have on the property. It is important to demonstrate the proposed undertaking's relationship to the property being evaluated. In addition, the letter includes a description and evaluation of all potential alternatives considered in order to avoid or minimize impacts to the property including the No Action alternative. By having a solid base of information, the consulting parties are able to evaluate the potential effects on the historic resources and determine what, if any, mitigative steps should be taken.

The letter serves as the preliminary documentation for determining potential effects and mitigative measures and may be used during Step 4 (Resolve Adverse Effects) if the proposed undertaking is determined to have an adverse effect on an historic property. In addition, this information may also be incorporated into future agreement documents, such as a Letter of Agreement, **Memorandum of Agreement** (MOA), or a Programmatic Agreement. Furthermore, the letter serves as the project impact review assessment for the SHPO and ACHP, when necessary.

The letter may include the following information:

1. A general description of the project, including schedule and its benefits.
2. A context description for evaluating NRHP-listed or eligible precontact and historic resources described.
3. A plan or map identifying the Area of Potential Effect (APE).
4. Identification of any NRHP-listed or eligible property that may be affected by the project, i.e., those included in the established APE. This can be a summary of property's physical description (present and historic) as well as its area(s) of significance.
5. A description of the alternatives considered and why they were not chosen.
6. A description of the mitigation and preservation measures that have been agreed upon by all parties.

1.4.5 Agreement Documents

The decisions reached during the consultation process are defined in a formal agreement document. This legal document outlines the fulfillment of

RELEASED - Printed documents may be obsolete; validate prior to use.

responsibilities under Section 106 and obligates the signing parties to carry out its terms. It shows that the agency has taken into account the effects on NRHP-listed or eligible properties and has given the ACHP a reasonable opportunity to comment.

The most common agreement document is an MOA. This document outlines the measures that consulting parties have agreed upon to **avoid**, **reduce**, or **mitigate** adverse effects that a project may have on NRHP-listed or eligible properties. There are three kinds of MOAs—a four-party, three-party, and two-party agreement. Proposed undertakings with impacts to an NHL typically requires a **four-party** MOA between the SHPO, ACHP, NPS, and the agency. A **three-party** MOA involves the agency, SHPO, and the ACHP as signatory. A **two-party** MOA, between the agency and SHPO, is when the ACHP has not been involved in consultation and receives the MOA after the others have prepared and signed it. Other interested parties including Native American tribes, permit applicants, or the general public may also request to be part of an MOA.

The first section of the MOA introduces the undertaking, the affected NHL, NRHP-listed or eligible properties, and who the consulting parties are. This section is usually composed of a series of "Whereas" statements about the project. The stipulations follow, often using the language, "(The agency name) will ensure that" the various agreed-upon steps are carried out. The document ends with a statement concerning the execution of the MOA and the implementation of its terms, followed by signatures of all the consulting parties.

The ACHP is given the opportunity for involvement in one of three ways: First, they may participate as a consulting party and then as a signatory to the resulting MOA.

Second, if the ACHP is not a consulting party and asked to review the MOA. The ACHP may accept the MOA as is, request changes, or issue written comments. After ACHP receives the required documentation, they have **45 days** in which to respond. The ACHP's acceptance of the MOA serves as its comment in this case. However, if the ACHP has issued written comments, the agency must consider these comments in deciding the next course of action or proceed as proposed. If the agency decides not to proceed with the project at all or chooses to proceed with an alternative, the agency must notify the ACHP of its decision, preferably before work has begun on the proposed undertaking. Once the ACHP either signs or issues comments on the prepared MOA, the Section 106 process is concluded and the statutory responsibilities under Section 106 of the NHPA is satisfied. And third, if consultation fails, no MOA is produced.

If an MOA was prepared and signed by all appropriate parties, the project continues under the terms of the MOA. An MOA includes provisions for termination and for reconsideration of the terms if the undertaking has not been implemented within a specified time.

Two other types of agreement documents are the **Conditional No Adverse Effect "**determination" and the **Programmatic Agreement** (PA). In the case of the former, the agency may propose to perform an action such as **rehabilitation**, **repair** or **stabilization** in accordance with the Secretary of the Interior's Standards for Rehabilitation so that adverse effects can be avoided. If the SHPO concurs with these "conditions," in accordance with 36 CFR Part 800.5(b), a Conditional No Adverse Effect determination will be prepared. The PA (among the agency, ACHP, and the SHPO) ensures compliance with the Section 106 review process using an alternative method, in accordance with 36 CFR Part 800.14(b). PAs are generally used for repetitive or widespread actions. It assures the historic, engineering, and architectural values of the historic properties under jurisdiction are recognized and considered in the course of ongoing activities and provides a protocol for the reuse, modification, replacement, or removal of historic facilities associated with current and future programs.

1.4.6 KSC Streamlines the Section 106 Compliance Process

KSC executed a Programmatic Agreement for Management of Historic Properties (KCA-4185) in 2009 with the Florida SHPO and ACHP that has streamlined the Section 106 consultation process. The PA developed covers the management of "*NRHP-listed and eligible facilities, structures, buildings, and objects"* at KSC. The PA has reduced the number of consultation letters, determined general maintenance activities on KSC's historic properties that do not require consultation, and established a wide range of mitigation measures (such as HABS/HAER recordation, website development, etc.). When a new property has been surveyed and determined eligible, the PA applies and

RELEASED - Printed documents may be obsolete; validate prior to use.

KSC provides an updated list of the current properties managed (Appendix B of the PA) to the SHPO once a year. With the ending of the Space Shuttle Program and the new vision, many of the historic properties will be modified to support the next generation of vehicles. In the PA, it was agreed upon that KSC may perform early historic recordation mitigation efforts to support future Section 106 consultation projects. This early effort has been complimented by the SHPO to the KSC Staff for their preservation efforts so that the material may be viewed by the public. KSC prepares a Consultation Letter in lieu of a Coordination Letter when an adverse effect has been determined on a NRHP-listed or eligible property. KSC must follow the guidance above for any ground disturbing or construction activities.

1.5 INTEGRATING NEPA AND SECTION 106

In accordance with 36 CFR Part 800.8, federal agencies are encouraged to coordinate studies and documents prepared under Section 106 with those done under NEPA. Section 800.8(a) of the regulations provides guidance on how NEPA and the Section 106 process can be coordinated. NEPA documents (i.e., EA/FONSI or an EIS/ROD) prepared by KSC will include appropriate scoping, identification of historic properties, assessment of effects upon them, and consultation leading to resolution of any adverse effects. During preparation of an EA, the results of the Section 106 review should be reported in the FONSI, with an explanation of how significant adverse effects will be avoided. During preparation of an EIS, the results of the Section 106 review should be reported in the draft EIS. Consultation to resolve adverse effects should be coordinated with public comment on the draft EIS, with the results reported in the final EIS. Any MOA developed under Section 106, or the final comments of the ACHP, are addressed in the ROD. Usually, the MOA should be executed before the ROD is issued, and the ROD should provide for implementation of the MOA's terms and stipulations (National Preservation Institute 2008). ACHP and CEQ guidance are contained in the NEPA NHPA Handbook.

In the case of an action categorically excluded from NEPA review (36 CFR Part 800.8(b)), KSC will determine if it still qualifies as an undertaking requiring review under Section 106 (Section 800.3(a)), then proceed accordingly. KSC will also conform to the consultation, identification, and documentation standards set forth in 36 CFR Part 800.8(c) and will notify in advance, the SHPO and ACHP, where it intends to use the NEPA process to comply with Section 106. A flow chart illustrating coordination between NEPA and Section 106 is provided in **Figure 1-3.**

1.6 NASA POLICIES AND DIRECTIVES

NASA's CRM Program is managed by the Agency's Federal Preservation Officer (FPO) at the Environmental Management Division (EMD) of NASA Headquarters (HQ); the program is implemented by each NASA Center's Historic Preservation Officers (HPOs). The Agency-wide program provides the policy and procedures to ensure that NASA complies with applicable CRM regulations. In 2006, a NASA CRM Panel was established. All Center HPOs are members of the Panel, which is chaired by the Director of the EMD. Among its charges, the Panel oversees the development of NASA's CRM Program in accordance with Section 110 of the NHPA.

The FPO along with the Historic Preservation Working Group (HPWG) developed **NPR 8510.1,** a NASA Procedural Requirement (NPR), **NASA Cultural Resources Management** effective June 20, 2012. This NPR establishes responsibilities, procedures, and guidelines for carrying out the requirements of the NHPA, its implementing regulations, EO 13287, and additional related laws and regulations. NASA HQ as well as KSC has promulgated a number of formal policy statements, directives, and procedural requirements. Guidance for implementing NASA Cultural Resource requirements was published in November 2012 by the NASA Environmental Management Division, Office of Strategic Infrastructure. A Section 106 process flow chart (**Exhibit 1-3**) is included in that guidance.

NASA Policy Directive (NPD) 8500.1C, "NASA Environmental Management" (effective date December 02, 2013) establishes the policy that NASA will comply with all applicable environmental laws, regulations, and executive orders, including those that apply to the preservation of cultural resources. It stipulates that environmental factors be considered "throughout the life cycle of programs, projects, and activities." Such "environmental factors" include consideration of environmental impacts as required by NEPA and NHPA. All actions at KSC involving historic properties are coordinated

RELEASED - Printed documents may be obsolete; validate prior to use.

with the EMB through the use of the KSC Environmental Checklist process KDP-P-1727 (**Figure 1-4**). Under Chapter 5, CRM Administration, Policy and Planning, the FPO is designated, in accordance with the NHPA and EO 13287, by the EMD Director, on behalf of the Assistant Administrator for Infrastructure and Administration.

NASA Procedural Requirement (NPR) 8580.1A, "NASA National Environmental Policy Act Management Requirements" (effective date August 01, 2012) addresses, in Chapter 3, Section 3.6, Foreseeable Undertakings, the integration of NEPA with other environmental review and consultation requirements/regulations.

RELEASED - Printed documents may be obsolete; validate prior to use.

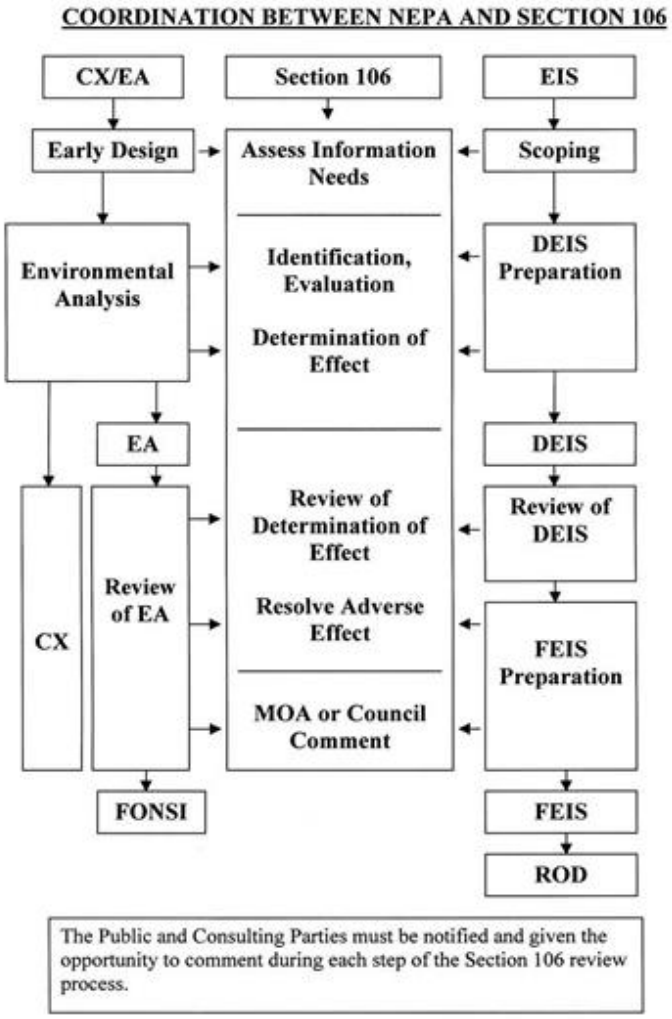


Figure 1-3. *NEPA and Section 106 Coordination Flow Chart. CX (Categorical Exclusion), DEIS (Draft Environmental Impact Statement, FEIS (Final Environmental Impact Statement)***.**

RELEASED - Printed documents may be obsolete; validate prior to use.

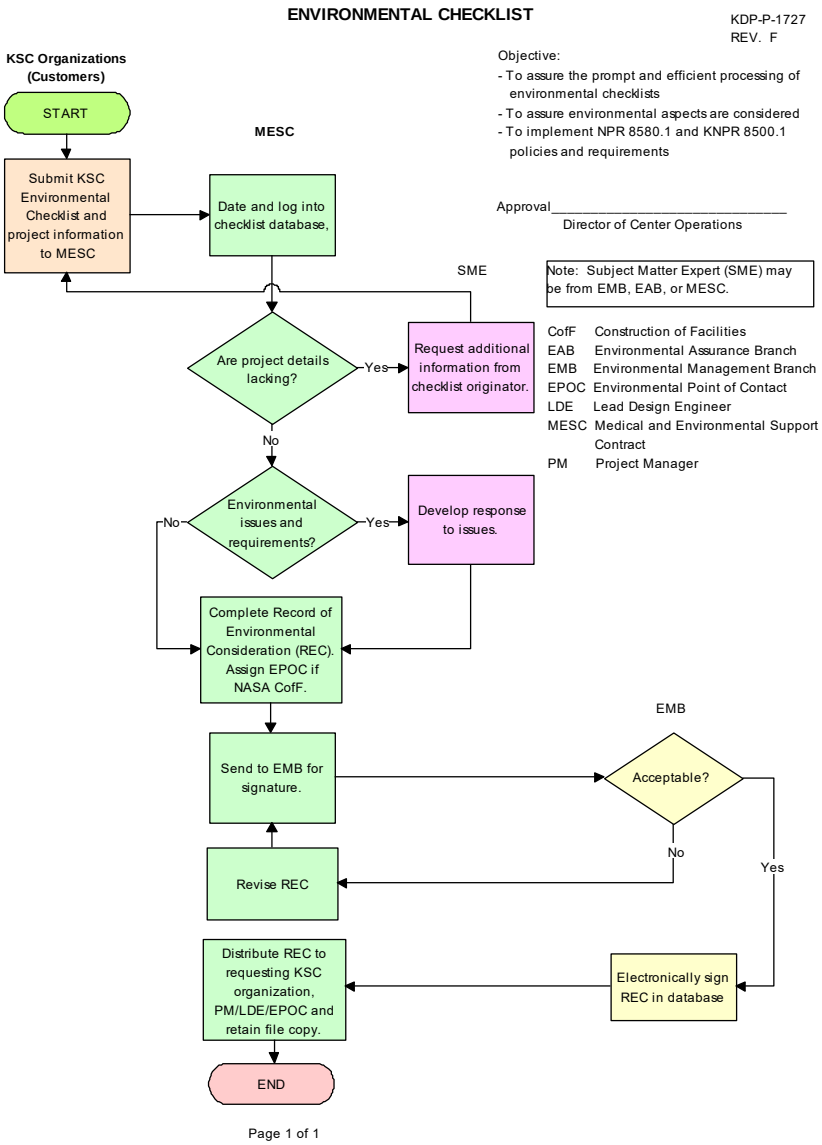


Figure 1-4. *The Environmental Checklist Process Flow Chart (KDP-P-1727).*

RELEASED - Printed documents may be obsolete; validate prior to use.

NASA Policy Directive (NPD) 4300.1B, "NASA Personal Property Disposal Policy" (effective date February 19, 1999; revalidated August 22, 2011) embodies the promotion of the sale and transfer of unneeded NASA excess and surplus personal property to other federal agencies and eligible donees, and to pursue acquiring excess property from other federal agencies for NASA use. It does not specifically mention historic properties.

NASA Procedural Requirement (NPR) 4310.1, "Identification and Disposition of NASA Artifacts" (effective date March 16, 1999; revalidated January 31, 2006) defines NASA artifacts, responsible entities, and the procedures and guidelines for identifying, reporting, screening, and transferring or disposal of artifacts. "The Agreement between NASA and the Smithsonian Institution Concerning the Transfer and Management of NASA Historical Artifacts" (dated February 20, 2008) is provided in **Exhibit 1-4**. It was originally signed in 2008 and is renewed every 5 years. The latest renewal was done via email as noted on the last page. This document will be Appendix "C" in the upcoming release of NPR 4310.1 NASA Artifacts. The National Air and Space Museum (NASM), administered by the Smithsonian Institution, is responsible for the "custody, protection, preservation, exhibition, and loan" of NASA artifacts. It has the first right to acquire available artifacts from NASA, and must make its request within **30 days** of notification. Artifacts are defined as "*unique objects that document the history of the science and technology of aeronautics and astronautics*." They may include "*objects such as major program vehicle components, unique devices, prototype and proof test articles, payloads or individual instruments, flight spares, astronaut tools and paraphernalia, design concept models, and high-fidelity simulators*," as well as "*experimental aircraft, test and simulation devices, prototype systems, structural and test models, and flight-tested materials*." NASA policies regarding the identification and disposition of artifacts are vested in the NASA Artifacts Committee.

NASA Policy Directive (NPD) 1440.6H, "NASA Records Management" (effective date March 24, 2008) requires that contract statements of work, for NASA contractors involving creation or maintenance of federal records, include appropriate records management requirements to comply with this NPD and its authorities, as per Section 5.d(3).

In February 2014, NASA executed an MOA with the General Services Administration (GSA) office of Personal Property Management. This agreement authorized the GSA to conduct the sale of surplus and exchange/sale of personal property on behalf of NASA (**Exhibit 1-5**).

KSC has a number of policies and directives that parallel those of the Agency proper. Cultural resources are addressed in Chapter 25 of the Kennedy NASA Procedural Requirements (KNPR), KNPR 8500.1 Revision C-1, **KSC Environmental Requirements**. Section 25.1 states that consultation required under Section 106 of the NHPA may be performed directly with the SHPO. Section 25.2 addresses the documentation of effects to historic properties, as mandated by the NHPA. Responsibility for this process is vested with the EMB, as documented in Kennedy Documented Procedure (KDP) KDP-P-1733 Rev D-1, Review of Potential Effects to Historic Properties. Section 25.3.1 stipulates "*all actions involving listed historic properties shall be coordinated with the EMB through the use of the KSC Environmental Checklist process KDP-P-1727*." KDP-P-1727 depicts the initial process of environmental review of projects and actions. Its use aids in the early identification of environmental issues, including potential impacts to historic properties. Review of excavation permit requests and site plans also allows for the determination of potential impacts to archaeological sites. The processing of KSC real property agreements is documented in KDP-KSC-P-1295, as illustrated in **Figure 1-5.** The Environmental Resources Document, KSC-PLN-1911, Revision E also addresses cultural resources in Chapter 12. This document discusses regulatory overview, the Section 106 process, MOA/PAs, integrating NEPA and Section 106, precontact and historic context, archaeological survey results and collections, and historic building surveys and results.

RELEASED - Printed documents may be obsolete; validate prior to use.

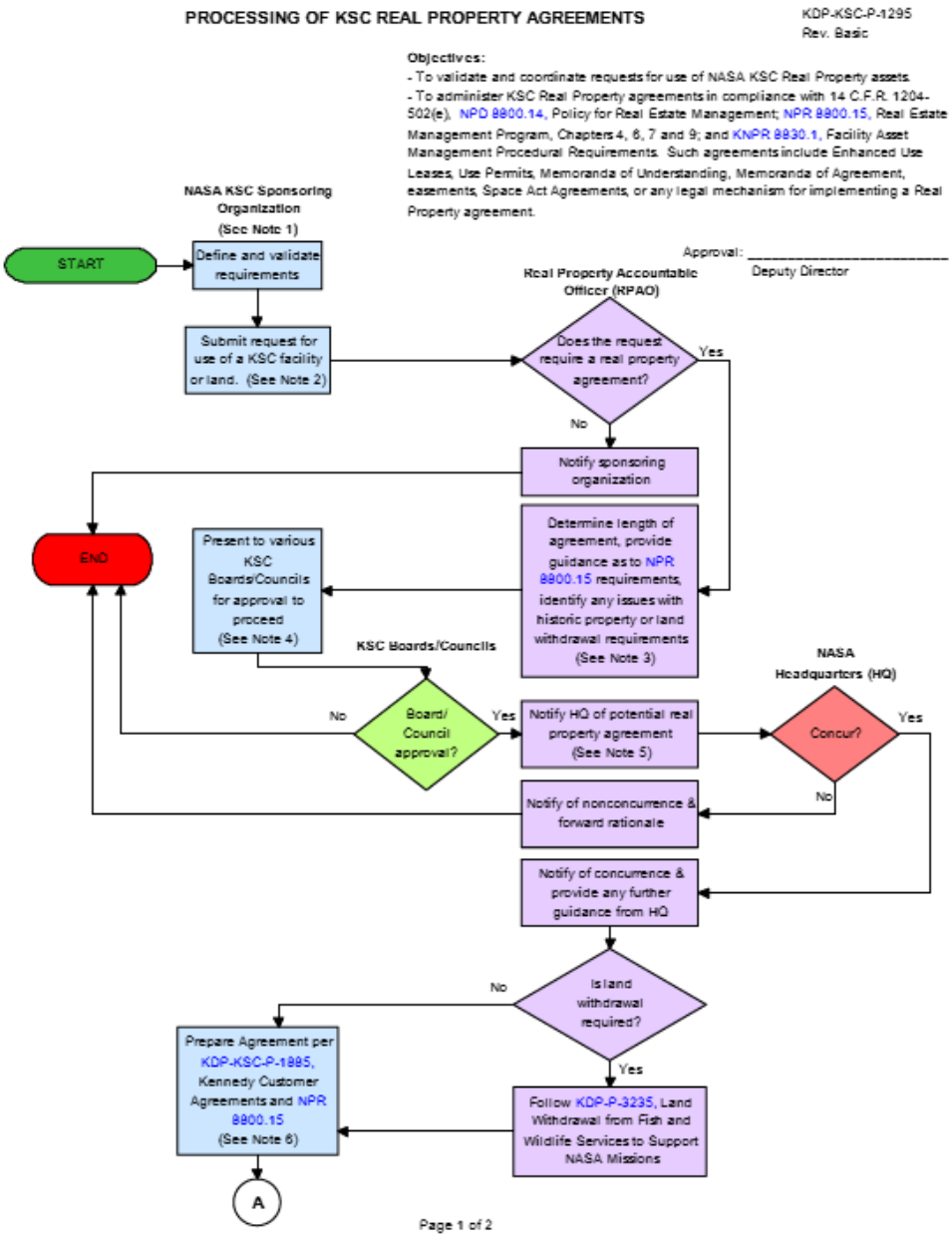


Figure 1-5. *Flow Chart for Processing of KSC Real Property Agreements, KDP-KSC-P-1295*.

RELEASED - Printed documents may be obsolete; validate prior to use.

Note 1: NASA KSC Sponsoring Organization is the Center Planning and Development Office..

Note 2: Notifications to the RPAO should include facilities required, land required, dates needed, a description of the proposal and a justification. In addition to working requirements with the RPAO, follow KDP-KSC-P-1304, KSC Space Allocation and Utilization Process for any requests for office, lab or any other type of physical space in a NASA KSC Facility. Also follow KDP-P-1727, Environmental Checklist.

Note 3: Refer to KDP-P-1733, Review of Potential Effect to Historic Properties and KDP-P-3235, Land Withdrawal from Fish and Wildlife Services (FWS) to Support NASA Missions.

Note 4: Requests to develop partnerships must be vetted through the Partnership Board. Requests for facilities, land, office space, labs, etc. must be approved by the Facility Management Board (FMB). Once vetted by the Partnership Board and approved by the FMB, the NASA KSC sponsoring organization shall obtain approval from the appropriate Kennedy Management Council.

Note 5: In accordance with NPR 8800.15, various levels of notification are required depending on whether the agreement is for an acquisition, is a Space Act Agreement, or is for greater than 5 years. Notifications range from informal e-mails to formal routing through the Space Act Agreement Maker (SAAM). HQ will generally provide recommendations on how to proceed.

Note 6: Work with RPAO and legal office to determine the type of agreement (Space Act Agreement, Enhanced Use Lease, Lease, Use Permit, Easement, etc.) to use. Obtain site approvals, survey, legal descriptions, etc., negotiate terms, develop business case, and all other documentation per NPR 8800.15, NPD 1050.1, Authority to Enter Into Space Act Agreements, KDP-KSC-P-1885, Kennedy Customer Agreements and KDP-KSC-P-1303, Site Planning Process. Abstracts and the required Real Estate documentation are routed for internal KSC review before submittal to Headquarters. If the agreement is longer than 5 years (per NPR 8800.15) RPAO will route the final agreements through the SAAM e-Router system to the Technical Capabilities and Real Property Management Division (TCRPMD).

Note 7: At a minimum, concurrence should include: Safety and Mission Assurance, Real Property Accountable Officer, Chief Counsel, Chief Financial Officer, Medical and Enviromental Management, Security, Center Operations and the Center Director.

Note 8: Agreements longer than 5 years, in-grants, and acquisitions must be finalized through all parties before submittal to HQ and shall include a letter signed by the Center Director or designee requesting TCRPMD's review and approval.

Page 2 of 2

Figure 1-5. *Flow Chart for Processing of KSC Real Property Agreements, KDP-KSC-P-1295 (cont.).*

RELEASED - Printed documents may be obsolete; validate prior to use.

EXHIBIT 1-1
CODE OF FEDERAL REGULATIONS PERTINENT TO CRM

RELEASED - Printed documents may be obsolete; validate prior to use.

EXHIBIT 1-1

Code of Federal Regulations (CFR) Pertinent to CRM

36 CFR 60, "National Register of Historic Places" addresses nominations by federal agencies, revision of nominations, and removal of properties from the National Register.

36 CFR 61, "Procedures for State, Tribal, and Local Government Historic Preservation Programs" establishes standards for the approval of state historic preservation programs; requires state historic preservation officers to conduct statewide surveys of cultural properties, prepare and implement state preservation plans, and cooperate with federal agencies in Section 106 compliance; and sets qualification standards for preservation professionals.

36 CFR 63, "Determinations of Eligibility for Inclusion in the National Register of Historic Places" establishes the process for federal agencies to obtain determinations of eligibility on properties.

36 CFR 65, "National Historic Landmarks (NHL) Program" establishes criteria and procedures for identifying properties of national significance, designating them as NHLs, revising landmark boundaries, and removing landmark designations.

36 CFR 68, "The Secretary of the Interior's Standards for the Treatment of Historic Properties" contains the Secretary of the Interior's Standards for Historic Properties, including preservation, rehabilitation, restoration, and reconstruction.

36 CFR 79, "Curation of Federally-Owned and Administered Archeological Collections" provides standards, procedures and guidelines to be followed by federal agencies in preserving and providing adequate long-term curatorial services for archaeological collections of artifacts and associated records that are recovered.

36 CFR 800, "Protection of Historic Properties" includes regulations of the ACHP to implement Section 106 of the NHPA and presidential directives issued pursuant thereto.

43 CFR 3, "Preservation of American Antiquities" establishes procedures to be followed for permitting the excavation or collection of prehistoric and historic objects on federal lands.

43 CFR 7, Subpart A, "Protection of Archaeological Resources, Uniform Regulations" provides definitions, standards, and procedures for federal land managers to protect archaeological resources.

43 CFR 10, "Native American Graves Protection and Repatriation Act Regulations, Final Rule" under NAGPRA, establishes a systematic process for determining the rights of lineal descendants, Indian tribes, and Native Hawaiian organizations to certain native American human remains, funerary objects, sacred objects, and objects of cultural patrimony with which they are affiliated.

RELEASED - Printed documents may be obsolete; validate prior to use.

EXHIBIT 1-2
NASA SECTION 106 CHECKLIST

RELEASED - Printed documents may be obsolete; validate prior to use.

Section 106 Checklist

The Section 106 process, as described in 36 CFR Part 800, consists of four basic steps, with each step having a series of tasks to complete. You may use this checklist to track the progress of your review.

Remember that Section 106 needs to be completed "prior to the approval of the expenditure of any Federal funds."

Step 1: Initiate Consultation (§ 800.3)

Check (Yes/No)	
	Project meets the definition of an "undertaking" [1]
	Undertaking" has no potential to cause effects to historic properties[1]
	Review of "undertaking" is subject to an existing Programmatic Agreement (PA)
	Identify appropriate State/Tribal Historic Preservation Office (SHPO/THPO) and federally-recognized Indian tribes/Native Hawaiian organizations, as appropriate
	Plan to involve the public (may use existing agency public participation procedures)
	Consider if, what, and how some project information may need to remain confidential
	Identify other consulting parties (e.g., interested parties, local government); proceed to Step 2

[1] *If no, then you have completed Section 106 review and are in compliance. These first two Step 1 tasks do not require consultation with SHPO/THPO.*

[2] *If yes, once you record how the project complies with the terms of the PA, Section 106 review is complete and you are in compliance. To remain in compliance, you must implement the project in accordance with the PA.*

Step 2: Identify and Evaluate Historic Properties (§ 800.4)

Check (Yes/No)	
	Define the Area of Potential Effects (APE)
	Review existing information regarding the APE (e.g., previous historic surveys, land use records, maps, SHPO information**)**
	Seek information from consulting parties to identify issues related to the undertaking's potential effects
	Gather information from federally-recognized Indian tribes, as appropriate
	Identify any known National Register (NR)-eligible or -listed properties
	Evaluate all other properties in APE for NR eligibility, regardless of age
	Submit finding and supporting documentation of "no historic properties affected" or "historic properties affected" to SHPO/THPO for 30-day review
	Notify all consulting parties of finding and provide supporting documentation
	If SHPO/THPO does not object to a "no historic properties affected" finding, make the finding/documentation available for public review before approving the undertaking (e.g., through the appropriate NOI/RROF process) [3]

	If historic properties are affected, proceed to Step 3

[3] *If there are no objections to a "no historic properties affected" finding, then you have completed Section 106 review and are in compliance. If SHPO/THPO does have an objection, you must consult with them to resolve the matter.*

Step 3: Assess Effects (§ 800.5)

Chapter 2 Check Chapter 3 (Yes/No)	
	Apply criteria of adverse effect, in consultation with SHPO/THPO and consulting parties
	Submit finding and supporting documentation of "no adverse effect" or "adverse effect" in writing to all consulting parties for 30-day review
	If adverse effect, consider modifications to the project or agree to conditions that avoid adverse effects
	Notify all consulting parties of finding and provide supporting documentation
	If SHPO/THPO and/or consulting parties do not object to a "no adverse effect" finding, make the finding/documentation available for public review before approving the undertaking (e.g., through the appropriate NOI/RROF process)[4]
	If there are still adverse effects, proceed to Step 4

[4] *If there are no objections to a "no adverse effect" finding, then you have completed Section 106 review and are in compliance. If there are objections, you must consult with each objecting party to resolve the matter. For further assistance, contact the Federal Preservation Officer.*

Step 4: Resolve Adverse Effects (§ 800.6)

Check (Yes/No)	
	Notify the Advisory Council on Historic Preservation (ACHP) of the adverse effect finding and provide documentation outlined in § 800.11(e)
	Invite ACHP to participate 1) if the process would benefit from their experience, 2) if the project directly and adversely affects a National Historic Landmark, or 3) if you will develop a PA
	Continue consultation with consulting parties to consider ways to avoid, minimize, or mitigate adverse effects
	Negotiate and draft agreed upon terms in an agreement document (Memorandum of Agreement or Programmatic Agreement (MOA/PA))[5]
	Have signatories and concurring parties sign the MOA/PA, as appropriate, and distribute copies to all consulting parties
	If there are still adverse effects, proceed to Step 4
	File a copy of the signed MOA/PA with ACHP and make it available for public review before approving the undertaking (e.g., through the appropriate NOI/RROF process)[6]
	Implement the undertaking in accordance with the signed MOA/PA

[5] *If consultation does not produce an agreement, you must seek ACHP participation. Should ACHP participation not result in agreement, the "Head of the Agency" may consider terminating consultation. For further assistance, contact your HUD Field Environmental Officer.*

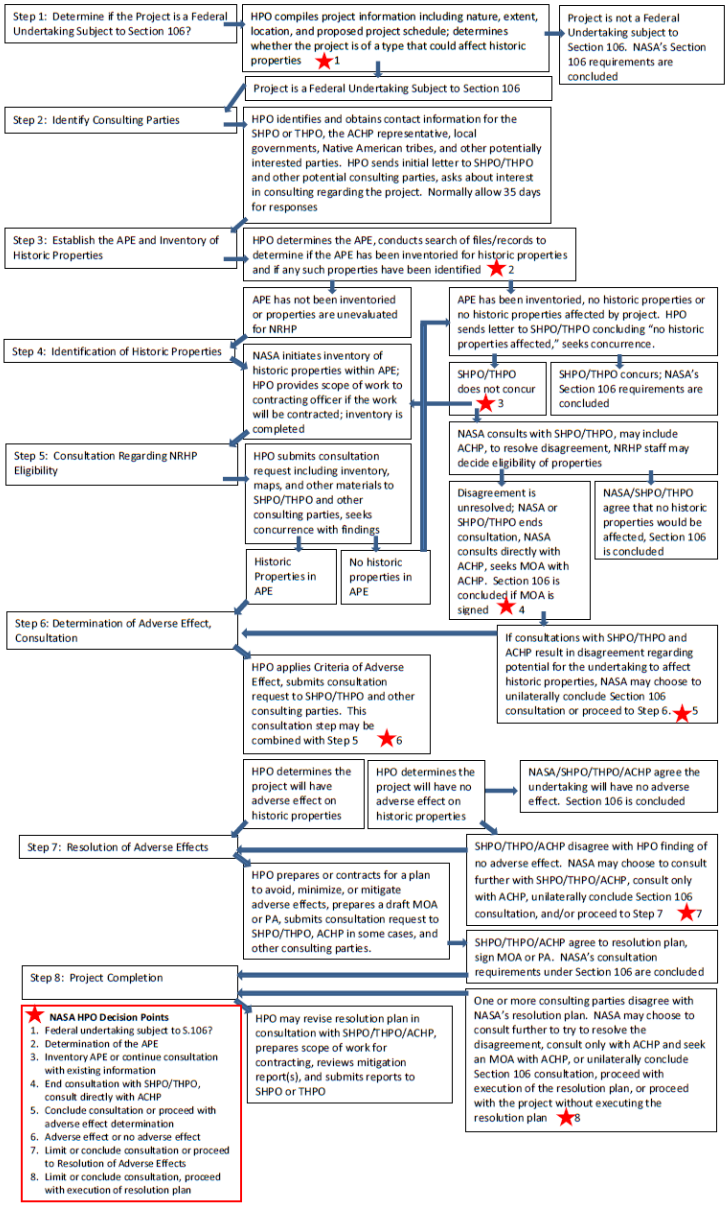
[6] *At this point, you have completed Section 106 review and are in compliance.*

EXHIBIT 1-3
SECTION 106 PROCESS FLOW CHART

RELEASED - Printed documents may be obsolete; validate prior to use.

Section 106 Process Flow Chart

Section 106 Process for NASA Personnel



RELEASED - Printed documents may be obsolete; validate prior to use.

EXHIBIT 1-4
AGREEMENT BETWEEN NASA AND THE SMITHSONIAN INSTITUTION CONCERNING THE TRANSFER AND MANAGEMENT OF NASA HISTORICAL ARTIFACTS

RELEASED - Printed documents may be obsolete; validate prior to use.

AGREEMENT BETWEEN THE NATIONAL AERONAUTICS AND SPACE ADMINISTRATION AND THE SMITHSONIAN INSTITUTION CONCERNING THE TRANSFER AND MANAGEMENT OF NASA HISTORICAL ARTIFACTS

WHEREAS in the course of its programs the National Aeronautics and Space Administration produces a large number of artifacts, many with great historical value and others with great value for education, exhibition, and other purposes, relating to the development, demonstration, and application of aeronautical and astronautical science and technology of flight, and will continue to acquire such materials; and

WHEREAS such artifacts are unique specimens relating to the science and technology of aeronautics and astronautics, and of flight in the atmosphere and space, which may consist of aeronautical and astronautical objects including, but not limited to, aircraft, space launch vehicles, spacecraft (both manned and unmanned), subsystems of the above, such as rocket engines, pressure suits and personal equipment, instruments, significant recorded data, operating handbooks, drawings, photographs, motion picture film and related documents, audio and video tapes, training devices, simulators, and memorabilia; and

WHEREAS the Smithsonian Institution is charged with the responsibility to preserve for perpetuity artifacts representative of aviation and space flight; to collect, preserve, and display aeronautical and space flight equipment of historical and educational interest and significance; to serve as a repository for scientific equipment and data pertaining to the development of aviation and space flight; and to provide educational material for the historical study of aviation and space flight.

THEREFORE, under the authority set forth in Section 203(c)(6) of the National Aeronautics and Space Act of 1958, as amended (72 Stat. 430; 42 U.S.C. 2473(c)(6); Section 4 of the Act of August 30, 1961 (75 Stat. 415, 20 U.S.C. 80c); and Sections (4) and (8) of the National Air Museum Amendments Act of 1966 (80 Stat. 310, 311; 20 U.S.C. 77a, 77d), the National Aeronautics and Space Administration (hereafter called “NASA”) and the Smithsonian Institution (hereafter called “Smithsonian”) enter into this Agreement concerning the transfer and management of those artifacts having such historical and educational or other value which have emerged and will emerge from the aeronautical and space programs administered by NASA.

1. NASA shall offer to transfer to, and the Smithsonian may accept such artifacts under NASA control which become available, after programmatic utility to NASA or other government agencies has been exhausted, although, in extraordinary circumstances, exceptions or alternative dispositions can be made by NASA. Before the decision to make an exception or alternative disposition is made, the proposed action shall be referred to the Joint Artifacts Committee (established in paragraph 4, below) for consideration. In addition, the Smithsonian may, pursuant to the procedures contained in paragraph 4, call a special meeting of the Joint Artifacts Committee to discuss the transfer or preservation of items of unusual historical interest that NASA has not yet declared to be artifacts. In

RELEASED - Printed documents may be obsolete; validate prior to use.

either instance, if no consensus can be achieved by the Joint Artifacts Committee, the issue shall, upon request of either NASA or the Smithsonian, be referred to the NASA Administrator and the Director of the Smithsonian's National Air and Space Museum (NASM) for consideration. In the event agreement still cannot be reached, the NASA Administrator will decide the issue. NASA undertakes no obligation to provide financial support to the Smithsonian for the storage, transport, preparation, and final transfer of space artifacts.

2. The Smithsonian Institution's National Air and Space Museum will accession into its National Collections and accept responsibility for the custody, control, protection, preservation, and display of such artifacts transferred by NASA both in the Museum itself and on loan to NASA and other appropriate organizations in a manner consistent with the prevailing collections policy of NASM. If NASM refuses a request from a NASA component or visitor center for a loan of a NASA artifact, or states its intention to terminate or not to renew an existing loan to NASA, NASA may call a meeting of the Joint Committee at which the reasons for and possible alternatives to the denial will be discussed. Loans of artifacts to NASA shall be made for periods of from three to five years, with the expectation that renewal will be granted. NASM may specify reasonable curatorial practices to be followed by NASA components or visitor centers with respect to loaned NASA artifacts, and NASA will implement these practices to the extent practicable.

3. In connection with the NASA artifacts transferred to the Smithsonian, it is understood that in no instance shall a NASA artifact be finally disposed of to an agency other than the United States Government, or destroyed, before an opportunity is extended to NASA to reacquire, not on a basis of purchase but of reasonable defrayment of the costs involved, custody, and control of the artifacts. Further, in the event that NASA determines that an item declared an artifact and transferred to the Smithsonian has renewed technical utility with respect to NASA's programs, the NASA Chair of the Joint Artifacts Committee may request NASM to loan the item back to NASA. NASM will make a good faith effort to comply with the NASA request in light of NASA`s stated need and the potential impacts on the NASM collection and/or operations. In utilization of this procedure, both NASA and the NASM will work promptly and closely to minimize any adverse impact that the loan could have on NASM operations. Cost of shipping and packaging the item for return to NASA will be borne or reimbursed by NASA.

4. The Smithsonian and NASA will establish a Joint Artifacts Committee to collect information on and consider issues relating to NASA artifacts and their transfer to the Smithsonian. This charter includes but is not limited to, those issues identified for Committee consideration in paragraphs 1 and 2 above. It is anticipated that the Committee will meet at least two times per year, although either NASA or NASM may call a special meeting on 30 days' notice.

5. The agreement shall be effective for five years from the date of the latest signature. Unless written notification is given by either party at least six months prior to expiration, it will be renewed automatically for an additional five years.

RELEASED - Printed documents may be obsolete; validate prior to use.

Michael D. Griffin	John R. Dailey
Administrator	Director
National Aeronautics and Space Administration	National Air and Space Museum Smithsonian Institution
Date 8 Aug 2008	Date 8.20.08

Note: 6/12/2013 e-mail between NASA HQ Director for Logistics and NASM's Space History Division Curator confirmed concurrence to execute the terms of the "automatic renewal clause" and extend the agreement another 5 years, expiring 8/20/2018.

EXHIBIT 1-5
MEMORANDUM OF AGREEMENT BETWEEN NASA
AND GSA OFFICE OF PERSONAL PROPERTY MANAGEMENT
FEBRUARY 19, 2014

RELEASED - Printed documents may be obsolete; validate prior to use.

MEMORANDUM OF AGREEMENT
BETWEEN
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
AND
GENERAL SERVICES ADMINISTRATION
OFFICE OF PERSONAL PROPERTY MANAGEMENT

I. PURPOSE

The purpose of this Memorandum of Agreement (MOA) is to set forth terms, conditions and procedures whereby the U. S. General Services Administration (GSA), Office of Personal Property Management, when requested, will provide for the disposition of surplus personal property and exchange/sale property by public sale for the National Aeronautics and Space Administration (NASA). Specifically, this MOA formalizes agreements for GSA to conduct the sale of surplus and exchange/sale personal property in accordance with procedure for disposal (40 U.S.C. Section 545) and the Federal Asset Sales (FAS) EGOV Initiative for all of NASA's installations and their sub-installations (hereinafter, "installations").

"Personal property" means any property, except real property. For purposes of this part; the term excludes records of the Federal Government, and naval vessels of the following categories: battleships, cruisers, aircraft carriers, destroyers, and submarines.

II: AUTHORITY

a. NASA - This Memorandum of Agreement is entered into on behalf of NASA under authority of the National Aeronautics and Space Act of 1958 (42 U.S.C. 2473 et seq.).

b. GSA - GSA enters into this Memorandum of Agreement pursuant to its authority in Title 40, U.S. Code.

III. SCOPE OF WORK

a. The GSA shall:

i. Evaluate surplus personal property and exchange/sale property (excluding term sales for recyclables) to determine the number and variety to be sold, and if necessary, the fair market value of unique items. When requested by NASA, determining the fair market value for such items may require the services of a professional appraiser, at additional cost to NASA.

ii. Coordinate with NASA installations (Appendix A) to determine the frequency of sales (bi-weekly, monthly, or quarterly) required, based on each installation's volume (to include large influxes) and warehouse capacity limitations.

RELEASED - Printed documents may be obsolete; validate prior to use.

iii. Perform administrative duties relative to the sale of NASA surplus personal property and exchange/sale property to include establishing the sales, reviewing and awarding sales, collecting all payments, disbursement of apportioned proceeds to the NASA installation, and exercising the contractual authority necessary to resolve any sales contract disputes.

iv. Upon prior mutual agreement for optional sales methods (sealed bid, auction, spot bid, drop by sale, negotiated, or fixed price) other than internet sales, provide sales personnel services, such as auctioneer, collection officer and/or additional personnel when feasible. These sales personnel services may require an additional fee.

v. Distribute net sales proceeds, which shall be transferred to the applicable NASA installation by Intra-Governmental Payment and Collection (IPAC) or Electronic Funds Transfer within an estimated 21 calendar days after all payments are received from the sale. GSA shall retain a pre- established percentage of the gross proceeds as its fee for services rendered, prior to disbursement of funds to the applicable NASA installation.

vi. Unless agreed upon by both parties prior to the initiation of the sales process, GSA shall assure the completion of all sales actions, including removal (exceptions section VI.b.xv) within 30 business days of any sold property.

IV. PERFORMANCE LOCATIONS

All NASA installations in the United States listed in "Appendix A" shall be performance locations.

V. PERFORMANCE PERIOD

a. This MOA is effective for a one-year period upon execution by both parties.

b. This MOA may be amended upon mutual consent of both parties. Such agreement will be in writing and signed by authorized representatives of both NASA and GSA.

c. Either party with an advanced written notice of thirty-day (30) calendar days may terminate this MOA.

d. Upon expiration, this MOA shall be renewable for five (5) one (1) year options, as determined by both parties.

RELEASED - Printed documents may be obsolete; validate prior to use.

e. GSA acknowledges that, should it fail to deliver the levels of service required by this MOA, NASA intends to pursue the authority to conduct internet sales, and, should it receive such authority, terminate or modify this agreement.

VI. RESPONSIBILITIES

a. Reporting:

i. NASA shall report its excess personal property to GSA electronically through the GSAXcess® batch process.

ii. NASA shall identify Space Shuttle Program and Hubble Space Telescope property by its unique property source code to ensure the correct reimbursement rate (section VIII) of sales proceeds are returned to NASA.

iii. NASA shall identify property that is for exchange/sale or excess property for which NASA is claiming surplus proceeds retention, so that GSA can process the proceeds of the sale of the property in accordance with the Federal Management Regulation (FMR) and section XIII, Reimbursement Rates, of the MOA.

iv. NASA shall provide their Activity Location Code (Station Deposit Symbol) and the appropriation or fund code for all items which require reimbursement.

v. NASA shall process surplus and exchange/sale property to GSA sales unless NASA determines that the continued cost of care and handling necessitates abandonment in accordance with the FMR.

b. Preparation for Sale:

i. NASA installations shall collaborate with GSA to determine the method of sale.

ii. NASA installations shall group items, which are available for sale within 20 business days prior to the anticipated sale date. NASA installations shall create the sale in NASA DSPL sales in accordance with NASA policies and procedures.

iii. NASA installations shall successfully send sales lots electronically to GSA via NASA's DSPL. A system generated email shall be sent to both GSA and NASA to confirm that a sale has been automatically sent. The NASA installation PDO shall follow-up with GSA if no confirmation email is received.

iv. GSA shall process the successful NASA installation electronic sales submission via NASA DSPL sales within three (3) to five (5) business days of GSA's system accepting the submission. Depending on the size (e.g. larger than 120 sales lots) and multiple sales during a month by the NASA installation, GSA may take up to seven (7) to ten (10) business days to initiate/process the sale.

RELEASED - Printed documents may be obsolete; validate prior to use.

v. NASA installations shall provide their GSA Regional Sales Office three (3) to four (4) digital photographs displaying different views of vehicles and high end items. For smaller items (desktop computers, laptops, monitors, printers, laboratory items, etc.), GSA requires only one (1) digital photograph of the sale lot.

vi. NASA installations shall identify items which require demilitarization (DEMIL), International Traffic and Arms Regulations (ITAR)/ export controls, rigging, special handling, permits, and/or items that can only be sold to a U.S. citizen.

vii. NASA reserves the right to withdraw property from sale at any time for legitimate bonafide NASA needs/requirements, in coordination with the GSA Sales Regional Office responsible for the sale.

viii. GSA Sales Offices shall provide cost-effective and efficient sales of surplus personal property and exchange/sale property in accordance with the FMR, Federal Property Management Regulation (FPMR), and NASA property disposal regulations/procedures.

ix. GSA shall distribute announcements of sale via Internet, electronic media and/or printed materials.

x. GSA shall ensure all property is sold under the description warranty clause —

> **Description Warranty.** The Government warrants to the original purchaser that the property listed in the GSAAuctions.gov website will conform to its written description. If a misdescription is determined before payment, the contract will be cancelled without any liability to the bidder. If a misdescription is determined before removal of the property, the Government will keep the property and refund any money paid. If a misdescription is determined after removal, the Government will refund any money paid if the purchaser takes the property at his/her expense to a location specified by the Sales Contracting Officer. The Refund Claim Procedure described below will be strictly followed for filing a claim. No refunds will be made, after property is removed, for shortages of individual items within a lot. **This warranty is in place of all other guarantees and warranties, expressed or implied.** The Government does not warrant the merchantability of the property or its purpose. The purchaser is not entitled to any payment for loss of profit or any other money damages - special, direct, indirect, or consequential."

xi. GSA shall consult with NASA installations PDO, as applicable, to establish the original upset (reserve) prices for surplus and exchange/sale property and to establish any special sales requirements (e.g., lowering minimum bid, utilizing a particular sales method, etc.).

RELEASED - Printed documents may be obsolete; validate prior to use.

xii. GSA shall post sales photos and announcements of sales via the Internet.

xiii. GSA shall incorporate in the sales term and conditions, any special instructions for items requiring DEMIL, ITAR/export controls, hazardous, and any applicable State and local laws and regulations.

xiv. GSA shall incorporate GSA Procedures for the recycling of Federal Electronic Assets (FEA).

xv. GSA shall coordinate inspections/viewing times, and the number of days allowed to pick-up the items being sold with the respective NASA installation PDO. The parties acknowledge that some items may require a longer than normal time for removal because of regulations relating to DEMIL, rigging, special handling, or permits.

c. Removal of Property

After sale and prior to release of property from NASA installations:

i. GSA shall provide NASA the Purchaser's Receipt and Authority to Release Property (GSA Form 27A) via email and signed by the Collection Officer.

ii. GSA shall provide NASA the electronically signed U.S. Export Control Certification from the purchaser for items which were identified by NASA installations that can only be sold to an U.S. citizen and require ITAR/export control restrictions. GSA shall send this documentation to the NASA installation PDO via email.

iii. GSA shall ensure that the purchaser is not listed on the Department of State Debarred Parties list and the Department of Commerce Denied Person list.

iv. GSA shall require the purchaser to provide proof of U.S. citizenship to NASA for all items identified as ITAR/export controlled restricted by the NASA installation in accordance with NASA regulations and procedures.

v. NASA shall coordinate the date/time of the removal of property with the buyer.

vi. NASA shall notify the GSA Sales Office when the purchased property has been picked-up/removed by the buyer.

RELEASED - Printed documents may be obsolete; validate prior to use.

VII. CONTRACT AWARDS

a. GSA shall be responsible for all pre-and-post award sales contracts administration as required and related to the sale.

b. GSA shall provide a list of all pre-and-post sales awards to the applicable NASA installation.

VIII. REIMBURSEMENT RATES

The rates below are applicable to items or sales based on the criterion, which includes exchange/sale, surplus reimbursable and surplus sale proceeds:

a. GSA shall receive 20% of the gross proceeds per contract. NASA installations shall receive the remaining 80% of the sale proceeds as reimbursable revenue.

b. For items designated by NASA as shuttle related or unique, GSA shall receive 10% of the gross proceeds per contract. NASA installations shall receive the remaining 90% as reimbursable revenue.

c. If special arrangements have to be made for GSA to conduct the sale (live auction, etc.), GSA may renegotiate with the NASA HQs for a different rate.

d. NASA and GSA may negotiate a one-time fee for unusual requirements that result from the divestiture of assets at the conclusion of a large program or project.

e. NASA shall not be charged a fee for property that is not sold.

IX. DISPUTES, CLAIMS, DEFAULTS, OR ADJUSTMENTS

a. GSA shall resolve any disputes, claims, defaults, adjustments and refunds with buyers and/or bidders related to the sales under this MOA. The respective NASA installation PDO shall be advised prior to all final decisions.

b. Any disagreements between NASA and GSA relating to sales will be resolved by the parties through negotiations conducted by the headquarters representatives of the two agencies.

RELEASED - Printed documents may be obsolete; validate prior to use.

X. COLLECTIONS, DEFAULTS, AND REMOVALS

a. GSA Regional Sales Offices shall be responsible for all monies collected during the sale. GSA shall provide copies of the Purchaser's Receipt and Authority to Release Property (GSA Form 27A) via email by the GSA Collection Officer to the buyer and to the NASA installation PDO, as applicable. Copies shall be provided to the NASA PDO within ten (10) working days following the completion of the sale, to include the removal of the property, unless otherwise stated in the sales terms and conditions.

b. GSA shall be responsible for issuing the United States Government Certificate to Obtain Title to a Vehicle (Standard Form 97), to the buyer after receiving payment.

c. In the event that the successful bidder fails to complete the terms of their contract with regards to payment and/or removal, GSA may re-offer the property to succeeding bidders. If succeeding bidders are not interested, GSA may coordinate with the respective NASA PDO to re-offer the property on another sale, or return to NASA for Abandonment /Destruction (A&D).

d. GSA shall ensure that bidders who are in default, or have been prohibited from participating in sales are not allowed to submit bids in public sales of NASA property.

e. GSA shall notify the NASA PDO of any property that is not sold within three (3) working days after the sale has been completed, and with collaboration with the NASA PDO, make a determination to re-offer the property on another sale, or initiate an Abandonment and Destruction (A&D) action.

XI. AGENCY REPORTS

a. GSA shall provide NASA installations a detailed monthly report pertaining to the GSA sales done for their activity. The report will display the activity for which the sale occurred; contract number; date of sale; item control numbers; sale/lots numbers; property type e.g. shuttle, exchange/sales, surplus; and the proceeds received for each lot.

b. GSA shall provide NASA HQ's Logistics Division with an annual summary report all sales and reimbursements by fiscal year to be delivered to NASA HQs by December 31 each year. The report will display information (total items sold, total proceeds, and total net proceeds) by Center, and the total for the Agency.

RELEASED - Printed documents may be obsolete; validate prior to use.

XII. REPRESENTATIVES

NASA POINT OF CONTACT:

Michael Eaton, Logistics Management Division
202-358-1439

GSA POINT OF CONTACT:
Michael Wyckoff, Director, Sales Program Division, Office of Personal Property Management
703-605-5748

XIII. EXECUTION

In consideration of the foregoing, the undersigned hereby execute this Memorandum of Agreement.

RELEASED - Printed documents may be obsolete; validate prior to use.

AGREED:

GENERAL SERVICES ADMINISTRATION

BY: _____ 2/19/14
Date

Marty Jennings
Assistant Commissioner
Office of General Supply and Services
General Services Administration
Federal Acquisition Service
Arlington, VA

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

BY: _____ 2/12/14
Date

Olga M. Dominguez
Assistant Administrator
Office of Strategic Infrastructure
NASA Headquarters
Washington DC

This agreement shall serve as the formal agreement for said fees upon the signatures of NASA and GSA representatives. Fees for GSA services include all contracting, contract administration services, processing and disbursement of payments.

RELEASED - Printed documents may be obsolete; validate prior to use.

APPENDIX A:

NASA Center	Acronym	Zip Code	AAC	ALC	POC	Phone #
Langley Research Center	LaRC	23681-0001	803301	80000501	Venita Robinson	(757) 864-2560
Ames Research Center	ARC	94035-1000	809101	80001201	Damon Ried	(650) 604-3827
Glenn Research Center	GRC	44135-3191	805501	80000701	John Betterson	(216) 433-3231
Glenn Plum Brook Station	GRC PB	44870-0000	805501	80000701	John Betterson	(216) 433-3231
Dryden Flight Research Center	DFRC	93523-0273	809103	80000024	Benjamin Robles	(661) 276-2590
Goddard Space Flight Center	GSFC	20771-0001	803226	80000002	Diane Goddard	(301) 286-5924
Wallops Flight Facility	WFF	23337-0000	803226	80000002	Diane Goddard	(301) 286-5924
Jet Propulsion Laboratory	JPL	91109-8099	809117	N/A	Eric Lau	(818) 354-8300
Marshall Space Flight Center	MSFC	35812-0001	804101	80004901	Philisha Stephens	(256) 544-6997
Michoud Assembly Facility	MAF	70129-0000	804101	80004901	Keith Savoy	(504) 257-3439
Johnson Space Center	JSC	77058-3696	807402	80000004	Robert Blake	(281) 244-2525
White Sands Test Facility	WSTF	88004-0020	807504	80000004	Johnny J. Bernal	(505) 524-5140
Kennedy Space Center	KSC	32899-0001	804200	80004904	Chris Spears	(321) 861-6872
Stennis Space Center	SSC	39529-6000	804412	80000101	Don Griffith	(228) 688-2144

RELEASED - Printed documents may be obsolete; validate prior to use.

APPENDIX B

ACROYMNS

DEMIL	DEMILITARIZATION
DSPL	NASA DISPOSAL TRACKING SYSTEM
EAR	EXPORT ADMINISTRATION REGULATIONS
FAS	FEDERAL ASSET SALES
FEA	FEDERAL ELECTRONIC ASSETS
FMR	FEDERAL MANAGEMENT REGULATION
FPMR	FEDERAL PROPERTY MANAGEMENT REGULATION
GSA	GENERAL SERVICES ADMINISTRATION
ITAR	INTERNATIONAL TRAFFIC IN ARMS REGULATIONS
LMD	LOGISTICS MANAGEMENT OFFICE
NASA	NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
OSI	OFFICE OF STRATEGIC INFRASTRUCTURE
PDO	INSTALLATION PROPERTY DISPOSAL OFFICER

RELEASED - Printed documents may be obsolete; validate prior to use.

Chapter 2.0 ENVIRONMENTAL AND HISTORICAL OVERVIEWS

2.1 INTRODUCTION

This chapter provides a summary of the natural environment of KSC, as well as the history of land acquisition and the current land uses in the operational and undeveloped areas. Also described are the relevant precontact and historic contexts.

2.2 PHYSICAL SETTING

KSC is located on the east coast of Florida, about 240 kilometers (km) (150 miles [mi]) south of Jacksonville, and to the north and west of Cape Canaveral. It is situated in Brevard and Volusia Counties between the Merritt Island Barge Canal to the south, the town of Oak Hill to the north, the Atlantic Ocean and CCAFS to the east, and the Indian River to the west (**Figure 2-1**). A large portion of the area, between the Indian River and the Atlantic Ocean, is situated in the northern part of Brevard County, with the extreme north boundary extending about 11 km (7 mi) into Volusia County.

KSC is 55 km (34 mi) long and varies in width from 8 to 16 km (5 to 10 mi). It encompasses 56,452 hectares (ha) (140,000 acres [ac]) or nearly 565 km^2 (218 mi^2), and contains a number of diverse environmental features. Nearly 40% of KSC consists of open water, including portions of the Indian River, Banana River, Mosquito Lagoon, and all of Banana Creek.

Beginning at the south, the land between the Merritt Island Barge Canal and the NASA Parkway is generally level and wet within the northwestern portion of this large sector. Maximum elevation is 1.5 m (5.0 ft) above mean sea level. Local vegetation communities include pine flatwoods, wet hammocks, salt marsh, and freshwater marshes and sloughs. To the east and southeast, along a roughly 3.2 km (2.0 mi) wide land area bordered on the east by the Banana River, a dune and swale topography prevails. Here, narrow linear ridges, less than 1.5 m (5.0 ft) in elevation, are separated by wet, interdunal sloughs. Immokalee and Myakka sands, which support pine flatwoods vegetation, are characteristic of the non-depressional land. Anomalies in this dune and swale environment include a few low, northeast to southwest trending ridges, characterized by moderately well drained Pomello sand and scrub vegetation. Within Kennedy Athletic, Recreation and Social (KARS) Park I, remnant oak/cabbage palm hammock fronts the Banana River. With few exceptions, the land lying adjacent to the river within the southern portion of KSC is level, poorly drained, and characterized by a native vegetation of longleaf pine and an understory of saw palmetto.

From the NASA Parkway north to Banana Creek, between the Kennedy Parkway and Indian River, the terrain is mostly level, with a maximum elevation of 1.5 m (5.0 ft) above mean sea level. The majority of land is a mosaic of pine flatwoods and wet hammocks, interspersed by sloughs, freshwater marsh, and salt marsh. Moore, Jones, and Seven Pines Creeks run south from Banana Creek. To the west, West Prong, Middle Prong, and Oyster Prong are contained within the submerged marsh zone bordering the Indian River.

The area surrounding the Shuttle Landing Facility (SLF) is generally level and poorly drained. A broad expanse of pine flatwoods, interspersed with freshwater marshes and sloughs, is characteristic. Predominant soil types in the flatwoods include Immokalee, Myakka, Basinger, St. Johns, and Wabasso sands. Between the pine lands and the submerged tidal marsh, which fronts the Indian River and Banana Creek, the dominant community is wet hammock. Here, soil types including Bradenton and Parkwood fine sands, as well as Copeland complex soil support a native vegetation of cabbage palm and hardwoods. The submerged marsh zone bordering the river and creek measures 1.6 to 3.2 km (1.0 to 2.0 mi) in width. It is broken by several short creeks, including Puckett, Gator, Catfish, Brock, and Cedar Hammock. The only topographic relief is found along the Kennedy Parkway. Here, low ridges of 1.5 m (5.0 ft) elevation, characterized by moderately well to excessively drained soils of the Pomello sand and Paola fine sand, 0-5% slope, parallel the highway. Dense scrub live oak and saw palmetto vegetate the ridges.

RELEASED - Printed documents may be obsolete; validate prior to use.

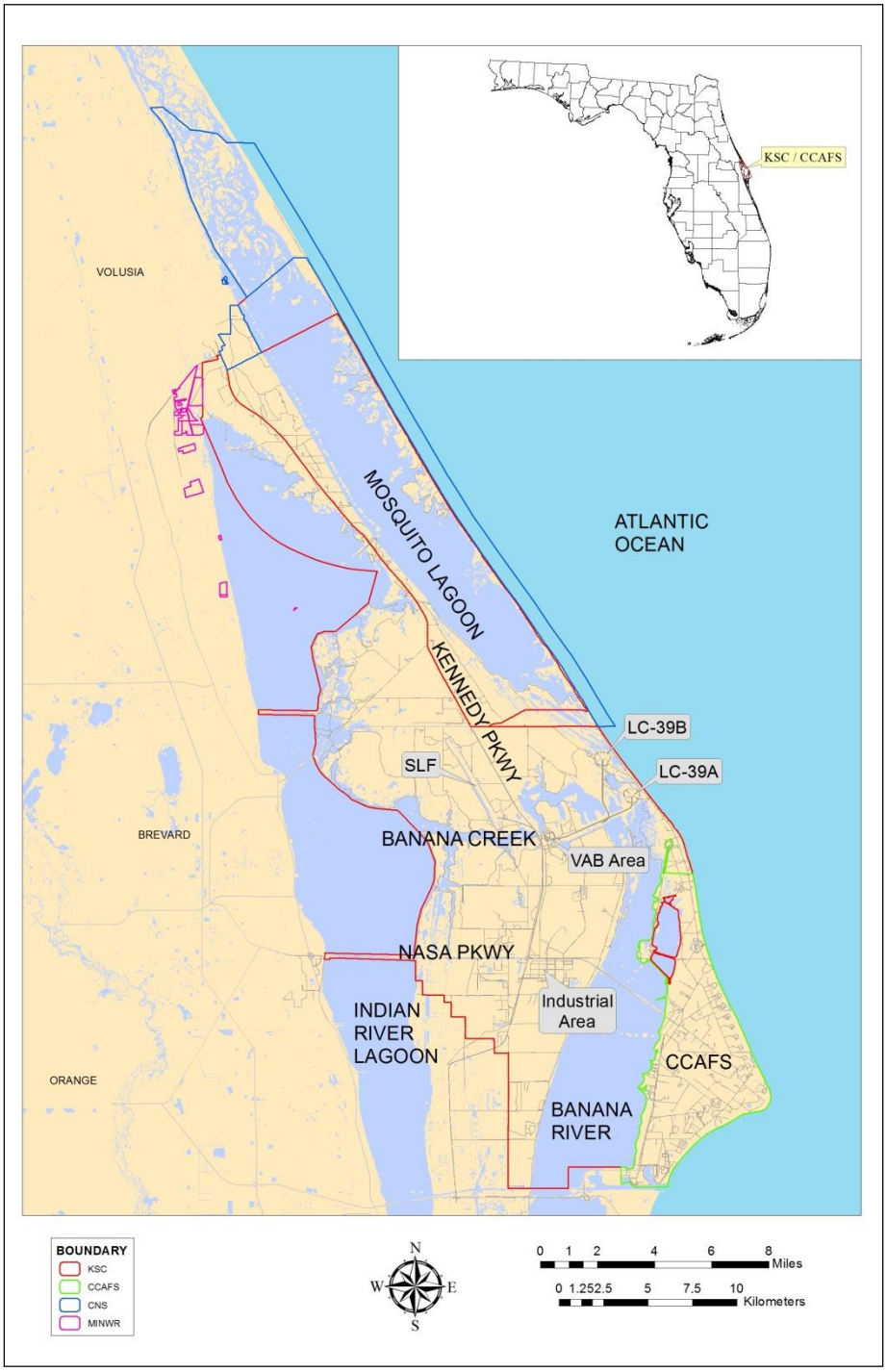


Figure 2-1. *Location of the Kennedy Space Center.*

RELEASED - Printed documents may be obsolete; validate prior to use.

The broad expanse north of Beach Road, between the Kennedy Parkway and Max Hoeck Back Creek, is also largely low-lying and wet. With the exception of a few isolated ridges, which reach a maximum elevation of 3.7 m (12.0 ft), the terrain is generally level, with elevations averaging .9 to 1.5 m (3.0 to 5.0 ft). Poorly drained soils of the Immokalee and Myakka types are characteristic of flatwoods; Anclote sand and Basinger sand occur in sloughs and depressions. The flatwoods also contain areas of very poorly drained Copeland complex soil, which supports cabbage palm hammock vegetation. A zone of impounded marsh lies adjacent to the dike roads that border the shoreline of Mosquito Lagoon. Two isolated strips of excessively drained Palm Beach sand, characterized by coastal hammock vegetation, front Mosquito Lagoon in the general vicinity of Clark Slough. The U.S. Department of Agriculture (USDA) *Soil Survey of Brevard County* (1974) indicates that aboriginal shell middens are associated with these coastal hammock areas. Continuing north, from just south of Dummitt Grove to the Haulover Canal, KSC is characterized by a narrow corridor of mostly level land, averaging about 1.5 m (5.0 ft) in elevation. Well drained Cocoa sand is found along the low ridges nearest the Kennedy Parkway; poorly drained Myakka sand is characteristic of the flatwoods to the east. Moving north to the Volusia/Brevard County line, the landscape becomes relatively elevated, with a series of low ridges averaging 3.0 to 3.7 m (10.0 to 12.0 ft). These upland areas are characterized by excessively to moderately well drained soils of the Paola, Astatula, Pomello, and Orsino fine sand types (USDA 1980). Some of this acreage has been cultivated in citrus.

The most dramatic relief as well as greatest environmental diversity is found in the northern portion of KSC, from Shiloh at the Brevard/Volusia County line north to the northern KSC border. Linear sandhills, characterized by soils of the Paola, Astatula, and Daytona sand types, which rise a maximum of 7.6 m (25.0 ft) above the surrounding terrain, are found directly east of the Kennedy Parkway. To the east of these excessively drained hills, the landscape is a mosaic of long, narrow dunelike ridges separated by narrow swales of poorly and very poorly drained soils. Isolated localities characterized by Myakka variant fine sand and hardwood hammock vegetation are found in the Antelm Gay Grant area. Canaveral sand and coastal hammock vegetation generally characterizes the elevated land that fronts the Mosquito Lagoon shoreline.

Most of the western Mosquito Lagoon shoreline has been impacted by ditching for mosquito control and the construction of dike roads. The ruins of former settlements, including fishing camps, mark a few localities along the shore. A network of sandy roads and firebreaks crisscross KSC, particularly to the north.

2.3 HISTORY OF LAND ACQUISITION

KSC became a resident of Cape Canaveral in 1958. The Saturn rocket project under the Army Missile Firing Laboratory (MFL), managed by Kurt Debus, was transferred to KSC one year later. Several Army facilities, various offices, and hangars at CCAFS were given to KSC, including Launch Complexes 5, 6, 26, and 34. MFL was renamed Launch Operations Directorate (LOD) and became a branch office of Marshall Space Flight Center (MSFC). As LOD responsibilities grew and the launch team expanded, KSC was designated as a field center named the Launch Operations Center (LOC), separating it from MSFC.

When President John F. Kennedy began the Man-to-the-Moon project, CCAFS land was insufficient to house further rocket facilities. New land was required to support expanded launch structures. Merritt Island, an undeveloped area west and north of the Cape was selected for acquisition and in 1961 the Merritt Island Launch Area (MILA) was created. In that year, KSC requested from Congress authority to purchase 32,380 ha (80,013 ac) of property, which was formally granted in 1962. The U.S. Army Corps of Engineers (ACOE) acted as agent for purchasing land, which took place between 1962 and 1964. KSC began gaining title to the land in late 1962, taking over 33,956 ha (83,907 ac) by outright purchase. Negotiations with the State of Florida provided submerged lands, resulting in the acquisition of property identified on the original Deed of Dedication. Much of the state-provided land was located south of the Old Haulover Canal and north of the Barge Canal. The purchase of KSC land included several small towns, such as Orsino, Wilson, Heath, and Audubon, many farms, citrus groves, and several fish camps.

An Air Force request in 1962 for space to install new Titan rocket facilities (Complexes 40 and 41) at the south end of KSC's newly purchased land prompted a re-evaluation of the total land buy. Negotiations between NASA and the Air Force resulted in the purchase of an additional 5,960 ha (14,727 ac) of

RELEASED - Printed documents may be obsolete; validate prior to use.

land in 1963, lying north and east of the Old Haulover Canal, including the towns of Allenhurst and Shiloh. This land was purchased by the ACOE with Air Force money in compensation for 140 ha (347 ac) taken by CCAFS for the two Titan launching facilities. Total holdings of KSC-owned land increased to 56,970 ha (140,776 ac). The State of Florida provided an additional 22,710 ha (56,118 ac), bringing the total of donated submerged land to 22,580 ha (55,795 ac). In 1963, LOC and MILA were renamed the John F. Kennedy Space Center to honor the late President.

In 1983, KSC increased its holdings when the Florida East Coast Railway requested a buy-out of its property east of Titusville, including the Jay-Jay rail yard. NASA acquired 74.9 ha (185.1 ac) as the result of this purchase.

2.4 CURRENT LAND USE

Prior to acquisition by NASA, land within KSC, between the Indian and Banana Rivers, was used primarily for citrus agriculture and general farming. Other land uses were hunting, fishing, and a bombing range. Residences and farms were scattered and settlement was generally sparse.

KSC developed a Land Use Plan in 1999, and participated in the development of a master plan for the Cape Canaveral Spaceport, in cooperation with the 45th Space Wing of the U.S. Air Force and the Florida Space Authority. Both the land use and master plan provided an overall context for future land uses on KSC while not identifying any specific facility or land development projects (NASA KSC 2007:26). The 2008 Master Plan was based on the Constellation Program, which has since been cancelled. The current Master Plan covering the years 2012 to 2032 was developed for the programmatic transitional phase between the Space Shuttle and Space Launch System (SLS) Programs and provides the necessary framework to support both NASA and commercial launch operations (KSC Master Plan 2012).

2.4.1 Operational Areas

Today, KSC maintains operational control over approximately 3,035 ha (7,500 ac) of the KSC land area (KSC Master Plan 2012). The major areas for facilities include the Industrial Area, the Vehicle Assembly Building (VAB) Area (also known as the LC-39 Area), and the SLF Area. All operational areas are situated south of Beach Road.

The **Industrial Area** was developed to support administrative/technical functions and to provide for areas in which hazardous payload processing operations could be performed. This area, located mostly east of Kennedy Parkway South and south of NASA Parkway East, includes the Headquarters Building (M6-0399), Neil Armstrong Operations and Checkout (O&C) Building (M7-0355), Space Station Processing Facility (M7-0360) and the newly constructed Kennedy Data Center (M6-0547). The **Central Campus** expansion will consolidate NASA operations into a smaller, cost-effective operational footprint and predominately include non-hazardous operations in support of NASA missions and programs. Additional land area is designated as Research and Development and includes **Exploration Park** and areas adjacent to Central Campus. Exploration Park provides its tenants an opportunity to conduct research and develop new technologies and applications in state-of-the-art facilities in close proximity to KSC and its launch sites.

West of the Industrial Area is the KSC **Visitor Complex**, a popular tourist destination. The Visitor Complex features displays, memorabilia, historic spacecraft (Rocket Garden and Early Space Exploration Exhibit), IMAX (Image Maximum) theaters, bus tours, a simulated ride into space, and the new Space Shuttle Atlantis exhibit.

The **VAB Area** was developed primarily to support launch vehicle operations and related launch processing activities. It contains the VAB (K6-0848), Launch Control Center (LCC) (K6-0900), OPF 1 & 2 (K6-0894), Launch Pads 39A (J8-1708) and 39B (J7-0337), Solid Rocket Booster (SRB) processing facilities, and other support facilities.

The **SLF Area** is located west of Kennedy Parkway North, between Banana Creek at the south and Beach Road to the north. This area contains the SLF Runway (UK-0027), SLF operations buildings, and landing aids systems support facilities. During the Space Shuttle Program, SLF facilities supported Mate-Demate operations, Shuttle Carrier Aircraft operations, and astronaut flight training activities. Future operations and development at the SLF will accommodate commercial spaceflight programs, horizontal launch and landing activities, testing of

RELEASED - Printed documents may be obsolete; validate prior to use.

unpiloted aerial vehicles, testing of experimental spacecraft, and ground-based research and training.

KSC is served by over 340 km (211 mi) of paved and unpaved roadways. The primary entryway into KSC is the NASA Causeway, which originates in Titusville as SR-405. Kennedy Parkway (SR-3) is the major north/south artery.

2.4.2 Undeveloped Lands

The remaining 95% of KSC land, 54,526 ha (134,738 ac), is undeveloped, and is required as a buffer zone, because of the hazards associated with the launching and landing of space vehicles. This undeveloped acreage is managed for KSC, through an agreement, with the U.S. Fish and Wildlife Service (USFWS or FWS), as the Merritt Island National Wildlife Refuge (MINWR), and by the NPS as a portion of the Canaveral National Seashore (CNS). The FWS and NPS "exercise management control over agricultural, recreational, and environmental programs within their respective jurisdictions" (NASA KSC 2007:26). The State of Florida has dedicated to the United States exclusive rights to state-owned submerged lands. Commercial fishing for oysters, shrimp, and other river fish species is permitted within MINWR and CNS areas. Both areas also support active recreational uses, including swimming, hunting, sport fishing, bird watching, and boating.

MINWR was established in 1963. U.S. Department of Interior (DOI) agreements maintain that all KSC land becomes a wildlife refuge unless specifically reserved for KSC use; KSC is able to withdraw land from MINWR at any time. The FWS maintains administrative control of the lagoons and river islands, adjacent wetland areas and impoundments, and citrus groves.

MINWR is maintained, as close as possible, as natural habitat. Strict construction limits are imposed to protect threatened and endangered fauna and flora. When MINWR was first established, the FWS managed 1012 ha (2,500 ac) of citrus groves (FWS 2008). These groves predate the government's purchase of KSC's property and were maintained for cultivation. No additional land could be added to these areas and when a grove failed, the land reverted to a natural state. The FWS administered leases allowing government-owned groves to be cultivated by Florida citrus farmers. In 2008, all the leases for the groves at KSC expired. At that time only about 283 ha (700 ac) were being managed on KSC. MINWR personnel also administer apiary (bee keeping) permits, regulate hunting, oversee commercial fishing rights, and issue recreational permits as well as encourage other public recreational activities. The FWS also has responsibility for habitat management activities, including prescribed burning, control of exotic vegetation, water level management, and planting and harvesting trees.

In 1975, **Canaveral National Seashore** was created from part of MINWR when the coastal strand and Mosquito Lagoon areas, north of Beach Road, became a new National Park. DOI delegated to the NPS administration of 16,593 ha (41,000 ac) of coastal Brevard and Volusia Counties. In addition to the beach property, CNS was given title to 440 ha (1,088 ac) originally purchased by KSC, on the west bank of Mosquito Lagoon. More property has since been purchased, which extends this preserve northward some 12.0 km (7.5 mi) beyond the KSC boundary. Within the larger area of CNS, 2,662 ha (6,655 ac) is KSC property. The NPS maintains administrative responsibility for the beach areas (e.g., Playalinda Beach) and recreation services, as well as public facilities along the seashore. The FWS assists the NPS by managing wetland areas around the Mosquito Lagoon, part of the Indian River Lagoon system.

2.5 PRECONTACT AND HISTORIC CONTEXTS

2.5.1 Introduction

Archaeologically, KSC lies within the East and Central Florida culture area, which is composed of the "lower (northern) and central portions of the St. Johns River, its tributaries, adjacent portions of the coastal barrier island-salt marsh-lagoon system, and the Central Florida Lake District" (Milanich 1994:243). This region was home to the St. Johns cultures, which developed out of the late Archaic period Orange culture. The primary trait common throughout the culture area is the distinctive chalky St. Johns pottery.

Originally, the KSC area was included in the Indian River area, as defined by Irving Rouse (1951). This zone begins at the northern headwaters of the coastal Indian River lagoon and extends south to the St. Lucie Inlet. The Indian River area is distinguished from the northern St. Johns area primarily by the inclusion of significant amounts of sand-tempered pottery in the ceramic assemblages. The sequence of

RELEASED - Printed documents may be obsolete; validate prior to use.

pre-Columbian cultures within this zone, as described by Rouse (1951), parallels that of the St. Johns region. Rouse's Malabar I period is coeval to the St. Johns I period and Malabar II is the temporal equivalent of St. Johns II (Milanich 1994:250). A chronological sequence of precontact cultures for the Indian River area is summarized in **Table 2.1**. A detailed context for the precontact period, provided in **Appendix B-1**, addresses the patterns of settlement, subsistence, and technological developments over time, and a baseline for significance evaluations and resource management. The precontact context is followed by the historic context, covering the period through 1950 (**Appendix B-2**), as well as the modern Space Age (**Appendix B-3**).

The archaeological and historical contexts, as well as the relevant research questions which follow, were developed in consideration of the data presented in the Florida DHR *Draft Comprehensive Historic Preservation Plan* (1990). Also helpful were the research themes outlined by Brewer in his 1991 Master of Science thesis entitled "*An Archaeological and Ethnohistorical Overview and Assessment of Mosquito Lagoon at Canaveral National Seashore, Florida*," and Austin and Layman's "*Archaeological Site Inventory and Management Plan for Volusia County, Florida*" (1989).

2.5.2 Research Domains

In their management plan for Volusia County, Austin and Layman (1989) identified several research domains that encompass a number of specific research questions. These have been adapted and used in the delineation of selected research questions of relevance for precontact and historic period archaeological sites within KSC.

Environmental Change and Precontact Adaptation

- How did local precontact populations adapt to changes in the environment, including rises in sea levels?
- Does the species composition of middens indicate seasonal availability, changing environmental conditions, and/or preferential exploitation?
- How did precontact populations adapt to and exploit the distinct environments of the barrier islands, lagoons, and marsh hammocks?
- Do differential deposits of clams and oysters at lagoon-shore middens reflect environmental changes over time relating to salinity and water quality requirements?
- What was the nature of the transition from riverine snail collecting along the St. Johns River to oyster and clam exploitation along the coastal lagoons during the Mt. Taylor-Orange Period transition?

Development of Settled Communities and Social Complexity

- What are the processes that lead to the development of increased sedentism, settled communities, and complex social systems?

Development of Plant Domestication

- When was the advent of plant cultivation in the KSC area, and what was its subsequent effect on the precontact culture and economy?
- To what degree was agriculture practiced?

Acculturation and the Effect of European Contact on Aboriginal Populations

- What effects did contact with the Europeans (Spanish, British, and French) have on aboriginal cultural systems (social, political, religious, technological)?
- What was the impact of colonial governance on native peoples in terms of economics, family and community life, religion, intertribal relations, demographics, and disease?

Aboriginal Culture History

- What is the chronology or sequence of cultural development in the KSC area?
- Was the KSC area populated by Paleo-Indian and Early Archaic populations?
- Are there wet site cemeteries within KSC?
- What cultural developments marked the transition from St. Johns I to St. Johns II?

Ethnohistory of Indigenous American Populations

- Where are the geographical/cultural boundaries of the Timucuan and Ais?
- Where are the villages noted by Mexia and Jonathan Dickinson?

RELEASED - Printed documents may be obsolete; validate prior to use.

European Exploration and Early Settlement

- Is there archaeological evidence of the voyage and landing of Ponce de Leon within KSC?
- Is there archaeological evidence for the confrontation between Menendez and Ribault, and/or of Ribault's fleet survivor's camp, fort, ship, and cannon?
- What was the nature of land use associated with the Spanish land grants within KSC?
- What was the nature of British period settlement within KSC? Was there any association with Turnbull's enterprise at New Smyrna?
- What was the nature of the earliest European occupation at Ross Hammock?
- What was the nature of Anglo and African-American homesteading in the general Haulover area during the 19th century?
- What was the nature of political and military affairs during the Second Seminole War within the KSC area?
- Is there archaeological evidence to confirm Civil War era action at the Ross Hammock saltworks?

Early Industrial Development and its Effect on Culture and Society

- What were the relative influences and effects on culture and society of the local sugar cane, citrus, cattle, timber (pine and live oak), turpentine/naval stores, and fishing industries?
- How were the old and new Haulover Canals developed and used?
- What were the effects of the development of local rail and road networks?

RELEASED - Printed documents may be obsolete; validate prior to use.

Table 2-1. Summary of Precontact and Historic Contexts.

PERIOD/DATE	DISTINGUISHING TRAITS, EVENTS, AND PERSONS
Paleo-Indian 11,000-8000 B.C.	Migratory hunters and gatherers; dry climate; lower sea level; fresh water scarce. Clovis, Suwannee and Simpson type projectile points; and unifacial tools.
Early Archaic 8000-6000 B.C.	Sea level rise; hunting and gathering; less nomadic; increased use of coastal resources; stemmed points including Wacissa, Arredondo, Hamilton, and Kirk types; and burials in wet environment cemeteries (e.g., Windover Site).
Middle Archaic/ Mt. Taylor 6000-2000 B.C.	First occupation of the St. Johns River Valley; large freshwater shell middens; increased sedentism; shellfish becomes an increasingly important part of the diet; more evidence for coastal occupation; stemmed, broad-bladed projectile points; steatite; fired clay objects; and burials in pond or slough cemeteries and middens.
Orange/Late Archaic 2000-1000 B.C.	Increased occupation of the coastal lagoons; appearance of first pottery (fiber-tempered); first coastal-estuarine shell middens (predominantly coquina). Shift to coastal shellfish and fishing subsistence. Increased sedentism. Virtual absence of oysters and heavy use of coquina imply a different environment than today.
Florida Transitional 1200-500 B.C.	First semi-fiber-tempered pottery; St. Johns Incised ceramic; increased use of sand temper; regionalism begins; and greater dependence on coastal and lagoon resources. Increase in population size, socio-political complexity, and territorial range.
St. Johns I/Malabar I 500 B.C.-A.D. 750	Rise in sea level brings wetter conditions; shift in dominance from clams to oysters reflect environmental change in Mosquito Lagoon; continuation of hunting/fishing/gathering way of life; first use of burial mounds; villages and camps located adjacent to freshwater and coastal resources. St. Johns Plain and Incised pottery, Dunns Creek Red, Glades Plain, Belle Glade Plain, and Sand Tempered Plain. Increased influence of Weeden Island appears late; central pit burials within the mounds. Trade is evidenced by exotic materials within the burial mounds.
St. Johns II/Malabar II A.D. 750-1565	First appearance of St. Johns Check Stamped pottery; increase in size and number of villages reflect larger populations; increased use of burial mounds; increase in the variety of burial patterns; and platform mounds make their appearance at some of the ceremonial complexes. Mississippian influences. European artifacts in burial mounds and middens at some sites (A.D. 1513-1565). 16th century peoples are various Timucuan-speaking groups, including the Ais, non-agriculturalists living along the Atlantic coastal lagoons and inlets, and the semi-agricultural Surruque to the north. Severe population reductions due to European diseases in the 16th century.
First Spanish A.D. 1565-1763	Limited Spanish settlement. European artifacts include Spanish metal, glass, and pottery (majolica, olive jar, and other coarse earthenwares). French Huguenots led by Jean Ribault massacred in 1565 by Menendez, founder of St. Augustine. Alvaro Mexia sent (1605) by the Spanish Governor to visit the Ais Indians on a diplomatic mission. His *Derrotero* contains descriptions of a number of Indian villages, possibly located within KSC: Surruque (near Ross Hammock); Urruya (Haulover Canal area); and Suyagueche (near Max Hoeck Creek). 1696 shipwreck of the Jonathan Dickinson party. Decline of the Ais population.

RELEASED - Printed documents may be obsolete; validate prior to use.

Table 2-1. Summary of Precontact and Historic Contexts (cont.).

PERIOD/DATE	DISTINGUISHING TRAITS, EVENTS, AND PERSONS
British A.D. 1763-1783	Turnbull's New Smyrna Colony (1767-1783) established along the northern Indian River. Establishment of Ross' Plantation at Ross Hammock. The Elliot's Plantation complex, located within KSC, was established in the 1760s and destroyed in 1779; it contained a sugar works factory, distillery, overseers homes, and a slave village. Construction of the King's Road, 1770-1774. General extent of British development in the area was not great.
Second Spanish A.D. 1783-1821	Spanish land grants include the 480 ha (1200 ac) H.M. Gomez grant (1803); the 400 ha (1000 ac) Francisco Reyes grant (1804); the 1821 Lucas Crayon grant (originally the Reyes grant); and the 1822 Antelm Gay grant (120 ha [300 ac]) within the Gomez grant).
American Territorial and Early Statehood A.D. 1821-1861	Florida becomes a U.S. Territory in 1821. Sparse white settlements. 1820s-30s - height of local sugar cane production. All local sugar plantations destroyed during the Second Seminole War (1835-1842). Douglas Dummett establishes the first orange grove in the KSC area in the 1840s; Fort Ann established to protect the Haulover, then abandoned in 1838; and the "Old" Haulover Canal completed in 1854.
American Civil War, Reconstruction, and Late 19th century A.D. 1861-1899	Civil War (1861-1865). Dummett groves, the largest in the state by 1867, were the beginning of the Indian River citrus fruit industry. In 1869, Nicole Tamajo built an octagonal-shaped house next to Dummett's grove. During the 1880s, KSC lands purchased as part of the 1.6 million ha (4.0 million ac) Disston purchase. "New" Haulover Canal constructed in 1887, one mile north of the old. Chester Shoals House of Refuge/Coast Guard Station constructed in 1884 and in use for 50 years. Canaveral Club established in 1890 along Banana Creek and post office established at Cape Canaveral in the same year. 1870s through 1890s establishment of communities of Shiloh, Clifton, Haulover, Allenhurst, Audubon, Heath, and Courtenay.
American 20th century A.D. 1900+	1910s establishment of communities at Wilson and Orsino. First bridge to Merritt Island constructed in 1921. CCAFS established in the 1940s. America enters the Space Age on July 24, 1950, with the first launch from the Cape. NASA begins operations at Cape Canaveral in 1958, with initiation of the Manned Space Program. In 1961, MILA was created. Property was acquired for KSC in the early 1960s. VAB and LC-39 constructed between 1962 and 1968. MINWR established in 1963. Apollo 11 marks first lunar landing in 1969. CNS created in 1975. Launch of *Columbia* in 1981 is the first mission of the Space Shuttle Program. The last mission of the Space Shuttle Program was flown in 2011.

RELEASED - Printed documents may be obsolete; validate prior to use.

Chapter 3.0 ACCOMPLISHMENTS

3.1 INTRODUCTION

Chapter 3 of the ICRMP contains a summary of the cultural resource management accomplishments at KSC through December 2014. Section 3.2 provides an overview of archaeological surveys and investigations conducted within KSC along with examples of more general regional studies to provide context. Section 3.3 describes the succession of historic facility inventory and evaluation projects at KSC and CCAFS, including a reexamination of previous NRHP and NHL designations. A description of determinations of effect and a discussion of the use of agreement documents such as MOAs, and PAs for development of mitigation plans is provided in Section 3.4. Previous and current efforts to mitigate the adverse effects of KSC's undertakings to significant historic properties, including archaeological sites and historic resources, and the development of agreement documents is summarized in Section 3.5. Sections 3.6 through 3.9 discuss completed and planned work, including mitigation measures foreseeable undertakings such as facility modifications, abandonment, demolition, or leases to government and commercial entities; statutory reporting requirements; and awards received by KSC.

3.2 ARCHAEOLOGICAL INVESTIGATIONS

3.2.1 Early Work: 1870s through 1960s

The general KSC area has been the focus of archaeological investigations for over 100 years. Among the early explorers of the larger sand mound and shell midden sites was J. Francis LeBaron, a civil engineer from Titusville. Between 1877 and 1878, he discovered a number of sites while laying out the tramway from Lake Harney to Titusville (LeBaron 1884). Other sites were discovered by LeBaron along the St. Johns and Indian Rivers (Rouse 1951:63). Between 1878 and 1890, Andrew E. Douglass of the New York Museum of Natural History also surveyed the Indian River area (Douglass 1885, 1890). Perhaps the most well-known of these early investigators was Clarence B. Moore who excavated a number of mounds along the Indian and Banana Rivers during the winter of 1895-1896 (Moore 1922).

Following the visits by Moore, there was a hiatus in archaeological work until the 1930s. In 1931, Gene M. Stirling, working under a grant from the Harvard Peabody Museum, explored 11 sites near Cape Canaveral (Rouse 1951:64). The results of this work were never published. From 1933 until 1934, site excavations were undertaken as part of the Civil Works Administration (CWA) program. Among the CWA undertakings was the excavation, under the direction of George Woodbury, of two sites previously located by Gene Stirling (Stirling 1934). This Depression-era work was supervised by Matthew W. Stirling, brother of Gene Stirling.

From 1944 through 1949, Dr. Irving Rouse performed a comprehensive survey of the Indian River area as part of the Florida project of the Caribbean Anthropological Program, sponsored by Yale University. Rouse's survey and synthesis resulted in the definition of cultural periods for this region of Florida (Rouse 1951). It is only recently that Rouse's terminology for the cultural periods of the Indian River area has been replaced by the terminology for the Northern St. Johns area. Also as part of the Yale project, Dr. John Goggin surveyed the northern St. Johns area, including present-day KSC property in Volusia County (Goggin 1952).

Several large sites in the KSC area were excavated by Ripley P. Bullen and associates between 1956 and 1963. These included the Castle Windy shell midden (Bullen and Sleight 1959), the Green Mound (Bullen and Sleight 1960), and Ross Hammock (Bullen et al. 1967). At the latter site, Ripley and Adelaide K. Bullen of the Florida State Museum and William J. Bryant excavated part of Mound I, carried out stratigraphic testing in the village midden and briefly tested the second mound contained within this site complex.

Beginning in 1965, George A. Long, a University of Florida graduate student, visited, examined, and recorded over 50 precontact and historic period archaeological sites within KSC and Cape Canaveral (then Cape Kennedy). Most of the sites visited were noted in previously published accounts, or reported by local residents and amateur archaeologists. Long also examined areas of construction activity plus locales deemed as "likely Indian habitation areas" (Long 1967:13). Long's thorough description of site features and accurate site location information provided a valuable body of data for future investigators.

RELEASED - Printed documents may be obsolete; validate prior to use.

3.2.2 Archaeological Surveys: 1970 through 2013

Between 1970 and 2013, a number of Phase I archaeological surveys were conducted within KSC (**Table 3-1**). Most of these projects focused upon small parcels of land proposed for facility development.

In July 1973, Richard Smith surveyed the Space Shuttle Runway area, resulting in the recording of **eight** new precontact and historic period sites (Smith 1973). Field survey methodology was primarily surface reconnaissance. During the following summer, Smith directed an archaeological reconnaissance survey of the 607 ha (1,500 ac) Space Shuttle Solid Rocket Booster Facility Site, carried out by students from Florida Technological University. In addition to the proposed development site, other nearby areas and previously recorded sites were examined and surface collections were made. Hammocks located along the south bank of Banana Creek, from Picnic Island to Ross Hammock, were among the areas investigated. This work yielded negative results (Smith 1974).

Carlos Martinez surveyed two project areas in 1977: the Hypergol Logistics Facility (Martinez 1977a) and the Chemical Waste Disposal Facilities (Martinez 1977b). The latter project, which entailed survey of ten alternate chemical waste treatment project areas, resulted in the discovery of one precontact site. In 1979, Dale Benton of Cultural Resource Management (CRM), Inc. surveyed three construction areas and an access road totaling 9.3 ha (23.0 ac) (Miller 1979). No new sites were discovered. Investigation of the proposed Cargo (now Payload) Hazardous Facility Site in 1983 by Water and Air Resources resulted in the discovery of **8BR217**, a 20th century refuse site (Dickinson 1983).

Several surveys of small parcels slated for development within the KSC Industrial Area were conducted by Robert E. Johnson of Florida Archaeological Services (FAS) in 1989. Systematic subsurface testing was the primary field survey method. These projects included the 14.2 ha (35.0 ac) Space Station Facility Site (Johnson 1989a), the 1.6 ha (4.0 ac) Child Care Facility Site (Johnson 1989a), and the 3.6 ha (8.8 ac) Existing "S" Band Antenna Site (Johnson 1989b). Johnson also investigated the 0.6 ha (1.5 ac) Proposed "S" Band Antenna Site bordering Banana River Drive (Johnson 1989b) and the 64.8 ha (160.0 ac) Proposed Schwartz Road Borrow Expansion Area (Johnson 1989b). No archaeological sites were found as the result of any of these projects. An archaeological survey for a 61 m (200 ft) wide and 4 km (2.5 mi) long segment of land west of SR-3 and south of NASA Parkway, within KSC, was conducted in 1990 by FAS and yielded negative results (Johnson and Ashley 1990).

Between 1991 and 2013, 10 Phase I archaeological surveys were performed by Archaeological Consultants, Inc. (ACI). These included the NCAR Radar Site (Deming 1991a), the Launch Viewing Area (Deming 1991b), the Landfill Site (Deming 1993), the Apollo/Saturn V Building Site (Deming 1995), the Orbiter Ground Support Equipment (GSE) Storage Facility Area (Deming 1996a), the Spoil Site 2B Construction Area (Deming 1996b), the International Space Research Park (ISRP) (ACI 2003), the Commercial Vertical Launch Complex (CVLC) (ACI 2008), the Bottle Dump Site (ACI 2009a), and the Post-Hurricane Sandy Dune Repair Project (ACI 2013). Of these, seven yielded negative results. Two new sites, **8BR773** and **8BR774**, were found during survey of the Launch Viewing Area; one new site, **8BR1663**, was discovered as the result of the Orbiter GSE Storage Facility Area survey; and one new site, **8BR1850**, was identified, evaluated, and recorded as a result of the ISRP project.

RELEASED - Printed documents may be obsolete; validate prior to use.

Table 3-1. Archaeological Surveys Conducted at KSC between 1970 and 2013.

DATE	INVESTIGATOR(S)	PROJECT NAME	NO. NEW SITES	SURVEY AREA ha (ac)	NO. SHOVEL TESTS	REFERENCE
1973	FTU*	NASA Space Shuttle Runway	8	~1,938 (4,790)	0	Smith 1973
1974	FTU	Space Shuttle Solid Rocket Booster Facility	1	607 (1,500)	0	Smith 1974
1977	FDAHRM**	Hypergol Logistics Facility	0	3.9 (9.6)	16	Martinez 1977a
1977	FDAHRM	Chemical Waste Disposal Facilities	1	24 (59)	7	Martinez 1977b
1979	CRM, Inc.	Chemical Waste Disposal Facilities	0	9.3 (23)	N/A	Miller 1979
1983	Water and Air Resources	Cargo (Payload) Hazardous Facility	1	24 (60)	126	Dickinson 1983
1989	FAS	Proposed Space Station Facilities Site and Child Care Facility Site	0	14 (35) & 1.6 (4)	46 & 8	Johnson 1989a
1989	FAS	Existing S Band Antenna Site	0	3.6 (8.8)	6	Johnson 1989b
1989	FAS	Proposed S Band Antenna Site	0	0.6 (1.5)	10	Johnson 1989b
1989	FAS	Schwartz Road Borrow Area Expansion	0	64.8 (160)	60	Johnson 1989b
1990	FAS	Proposed NASA SR-3 Expansion Project	0	24.7 (61)	46	Johnson and Ashley 1990
1990	ACI	Archaeological Survey to Establish Zones of Archaeological Potential (ZAPs) in the VAB and Industrial Areas of the KSC	1	158 (390) & 142 (350)	174 & 215	ACI 1990
1991	ACI	Archaeological Survey to Establish ZAPs in the Launch Complex Area (Option 1) of the KSC	8	332 (820)	459	ACI 1991
1991	ACI	National Center for Atmospheric Research (NCAR) Radar Site	0	0.85 (2.1)	9	Deming 1991a
1991	ACI	VIP Launch Viewing Area	2	N/A	N/A	Deming 1991b

*Florida Technological University

**Florida Division of Archives, History, and Records Management (now Florida Division of Hisotrical Resources)

RELEASED - Printed documents may be obsolete; validate prior to use.

Table 3-1. Archaeological Surveys Conducted at KSC between 1970 and 2013. (cont.).

DATE	INVESTIGATOR	PROJECT NAME	NO. NEW SITES	SURVEY AREA	NO. SHOVEL TESTS	REFERENCE
1992	ACI	Archaeological Survey to Establish ZAPs in the Shuttle Landing and KSC South Area (Option 2) of the KSC	1	465.4 (1,150)	423	ACI 1992a
1992	ACI	Archaeological Survey to Establish ZAPs in the KSC North Area (Option 3) of the KSC	21	202 (500)	503	ACI 1992b
1993	ACI	65-acre Proposed Landfill Site	0	26 (65)	42	Deming 1993
1995	ACI	Apollo/Saturn V Building Site (monitoring only)	0	18	0	Deming 1995
1996	ACI	Orbiter Ground Support Equipment (GSE) Storage Facility Area	1	1.2 (3)	30	Deming 1996a
1996	ACI	Archaeological Survey to Establish ZAPs in the KSC North Area, East of State Road 3 (Basic Contract Area) of the KSC	19	265 (655)	348	ACI 1996
1996	ACI	Spoil Site 2B Construction Area, KSC	0	36 (90)	15	Deming 1996b
2003	ACI	Proposed International Space Research Park (ISRP) at KSC	1	272 (671)	60	ACI 2003
2006	IRAS***	Clifton Schoolhouse	1	0.2 (0.5)	34	Penders 2008
2008	ACI	Proposed Commercial Vertical Launch Complex (CVLC) at KSC	0	186 (460)	114	ACI 2008
2008	SEAC	Elliot Plantation Complex	N/A	N/A	N/A	Schwadron
2009	ACI	Bottle Dump Site	0	0.4 (1)	4	ACI 2009
2013	ACI	Post-Hurricane Sandy Dune Repair	0	27 (66)	82	ACI 2013
Total of New Sites			**66**			
***Indian River Anthropological Society						

RELEASED - Printed documents may be obsolete; validate prior to use.

In addition to these investigations, reconnaissance-level archaeological surveys have been conducted for the CNS (Ehrenhard 1976), MINWR (Griffin and Miller 1978), and CCAFS (Levy et al. 1984).

Surveys Conducted on CNS

The 1975 cultural resource inventory of the CNS, completed by SEAC and NPS, under the direction of John E. Ehrenhard, included the assessment of 62 archaeological and historical sites within the CNS boundaries. In addition to revisiting previously recorded sites, **25** new sites were located and documented. All of the new sites are shell middens, with the exception of two historic period cemeteries.

Several survey projects have been undertaken at the CNS by SEAC archaeologists since the time of Ehrenhard's work. These include the archaeological monitoring of construction activities related to the extension of the boardwalk at the Turtle Mound site (Finch 1980; Ehrenhard 1980; Taylor 1982); archaeological reconnaissance of the Camera Pad Road improvements at Playalinda Beach (Taylor 1984); archaeological assessment of proposed access road and parking sites at Apollo Beach (Marrinan 1984); investigations for the proposed boat ramp and parking lot within the North Beach area (Horvath 1988); and several surveys along mosquito control dikes (Brewer 1991b, 1992; Horvath 1992). Additionally, in the summer of 1989, Stephen Bryne of SEAC, investigated areas scheduled for the construction of comfort stations at existing parking areas at Playalinda and Apollo Beaches and within the proposed Playalinda Beach Access Road right-of-way. Bryne's work resulted in the identification of **three** archaeological sites (Bryne 1989a, 1989b). More recently, SEAC archaeologists have completed surveys along the proposed boardwalk at Eldora (Halchin 2001a, 2001b); at the Bio-Lab Dike Road (Halchin 2001b); along two fire breaks within CNS (Lawson 2002); at the Leeper House and Stansfield House incident to installation of planned utilities (Halchin 2004); at Klondike Beach (Lawson 2004); at Seminole Rest (Brewer 2000; Halchin 2000; Lawson 2006); at the North District and Bill's Hill (Halchin 2001b; McNeill 2007); and a SEAC supported investigation at the Mosquito Lagoon House of Refuge in 2008 (McKinnon 2010).

Other relevant archaeological studies at CNS include a 1977 review of its history (Mote 1977), a preliminary Cultural Resource Management Plan (Ehrenhard 1982), and an archaeological overview and assessment of CNS (Brewer 1991a). In addition, SEAC conducted an excavation at the Armstrong Site (Brewer and Horvath 2004) and the Seminole Rest Site (Horvath 1995), as well as a beach-face magnetometer survey (Brewer et al. 1998).

Between 2005 and 2006, SEAC staff conducted site condition assessments for 121 archaeological sites located within CNS. Of these, 29 sites were assessed in August 2005 by Dr. Bennie Keel and John Stiner. Another 92 sites were visited and assessed during two trips between February and April 2006, including 41 sites located within the KSC North Area, east of SR-3 (Hellman 2007).

In March and July of 2009, SEAC staff conducted archaeological surveys focusing on sites within the Mosquito Lagoon that are threatened by erosion from storm surges and boat wakes, and rising sea levels. During this survey 50 new archaeological sites were recorded (Hellman 2009). Another survey was performed in June 2010 as a continuation of the 2009 survey in a different area of Mosquito Lagoon. **Twelve** new sites were recorded as a result of this fieldwork (Hellman 2010).

Surveys conducted on MINWR

Lands within the MINWR have also been the focus of archaeological survey since the 1970s. Griffin and Miller's work (1978) entailed a detailed literature search and summary of the archaeology and history of the refuge. Systematic field survey focused only upon those areas planned for modification through fiscal year 1980, including three areas where fire lane construction was proposed, 5.7 ha (14.0 ac) planned for water management, 4.4 ha (11.0 ac) proposed for interpretation and recreational development, plus surface survey along 41.8 km (26.0 mi) of existing dikes. Four recorded historic period sites (**8BR78, 8BR175, 8BR180, and 8VO160**) were inspected, and recommendations made for their preservation and interpretation.

Since this project, other archaeological investigations within the MINWR include a review of the cultural resource potential of the proposed Service Complex and Visitor Center (Miller 1981). No new sites were recorded as a result of this survey.

An assessment of impacts to historic properties as a result of the construction of a MINWR administrative office building was conducted in 2009. It was determined that two historic properties near the construction area would not be impacted and an archaeological survey was not warranted (Kanaski

RELEASED - Printed documents may be obsolete; validate prior to use.

2009a). The FWS also proposed to rehabilitate and repair sections of the T-10J dike at MINWR in 2009. There were no recorded historic properties within the project area and after evaluation it was decided the undertaking would have no effect on cultural resources (Kanaski 2009b).

Surveys Conducted on CCAFS

In 1982, an intensive archaeological survey of portions of CCAFS was initiated by Resource Analysts, Inc. of Bloomington, Indiana (Levy et al. 1984). This project included background research and field survey for archaeological sites and historical/architectural resources located within three areas: 728.5 ha (1,800.0 ac) along the Banana River, 202.4 ha (500.0 ac) near the Atlantic Coast and 323.8 ha (800.0 ac) within the non-coastal interior. A site location predictive model was formulated based upon the results of systematic survey. As a result, six previously recorded sites were re-examined and **26** new sites were recorded. Archaeological testing for the purpose of NRHP eligibility determination was not a part of this study.

Other archaeological work at CCAFS in support of NASA programs included a 1976 survey of the Proposed Off-Loading Facility for the Space Shuttle Solid Rocket Booster (Marrinan 1977). As a result, no new sites were identified. The Phase I archaeological survey of Launch Complex 17, Area 55 Office Complex, Launch Complex 41 Line of Sight, and Technical Support Area Storage Facilities by U. S. Army Corps of Engineers, Mobile District, archaeologists Ernie Seckinger and Jerry Nielsen resulted in the location of **two** archaeological sites (ACOE 1989).

Surveys Conducted in the Vicinity of KSC

Two county-wide assessment projects have added to our knowledge of archaeological settlement in the general KSC area. In 1989, a site location predictive model, management plan, and site inventory for Volusia County were prepared (Austin and Layman 1989; Layman 1990). These efforts, which included informant interviewing and limited field survey, resulted in the recording of **25** archaeological sites. Also in 1989, six unincorporated portions of Brevard County were the focus of archaeological investigation by the University of West Florida, Institute of West Florida Archaeology in Pensacola (Bense and Phillips 1990). Work included the development of an archaeological site location predictive model, reconnaissance level survey of six areas, and testing and refinement of the predictive model through field survey and data analysis. **Thirteen** new sites were added to the Brevard County inventory as a result of this investigation.

A noteworthy archaeological discovery in the KSC vicinity was the location of the Windover Site (**8BR246**) in Titusville during the early 1980s. This Early Archaic period cemetery, situated in a peat pond, was the focus of several seasons of excavation, beginning in 1984 (Doran and Dickel 1988, Doran 2002). The significant find of preserved human brain tissue, textiles, human and animal bone, and wooden artifacts were among the unique findings at this site, now listed in the NRHP.

3.2.3 KSC-wide Predictive Model Survey

According to the Secretary of the Interior's Standards and Guidelines for Archaeology and Historic Preservation, predictive modeling is defined as: "*an application of basic sampling techniques that projects or extrapolates the number, classes and frequencies of properties in unsurveyed areas based on those found in surveyed areas.* ***Predictive modeling can be an effective tool during the early stages of planning an undertaking, for targeting field survey, and for other management purposes. However, the accuracy of the model must be verified; predictions should be confirmed through field testing and the model redesigned and retested if necessary.***"

Between 1990 and 1996, a KSC-wide Archaeological Survey was conducted by ACI. The objective of this project was to establish differential Zones of Archaeological Potential (ZAPs) within all areas of KSC. The following tasks were completed:

- The boundaries of all previously recorded archaeological sites within the study area were relocated and areally delimited and evaluated for significance per the criteria of eligibility for listing in the NRHP.

- The areas were defined as low, medium, and high probability. Each zone was defined based upon the anticipated potential for containing significant or potentially significant archaeological sites. The determination of these ZAPs resulted in a KSC-specific archaeological site location predictive model.

- Archaeological field reconnaissance surveys were conducted within each of the three ZAPs

RELEASED - Printed documents may be obsolete; validate prior to use.

identified. This work was designed to test the validity of each defined ZAP. Adjustments and/or refinements were made to improve the reliability of the predictive model.

- A set of U.S. Geological Survey (USGS) quadrangle maps showing the ZAPs defined by this effort as well as the locations of known archaeological sites were prepared. These baseline maps were used to create a layer in the KSC Geographic Information System (GIS) database.

- Information from ZAP models developed from previous archaeological studies at KSC was incorporated into the final KSC-wide predictive model.

- Draft and final reports detailing the methods and results of the predictive model survey were prepared. The final reports incorporated comments received from the Florida DHR and the KSC HPO.

- Florida Master Site File (FMSF) forms for archaeological sites discovered during the survey were prepared and provided to KSC.

- The archaeological survey findings on the use of the ZAP model were approved by the SHPO (**Exhibit 3-1**).

Background research and archaeological field survey within KSC was initiated in 1990 with investigation of the Industrial and VAB Areas. Initial background research focused upon both the history of archaeological research within and near KSC, as well as an analysis of site locational patterning for all previously recorded archaeological sites. The study of the correlation between site location and such environmental variables as distance to a source of freshwater, soil type, natural vegetation community, and landform, provided the basis for the formulation of a first generation site location predictive model for the VAB and Industrial Areas (ACI 1990).

In 1991, both the Launch Complex Area (Option 1) and SLF and KSC South Areas (Option 2) were investigated serving to further refine the site location predictive model. Reports containing the methodology and results of these efforts, as well as site evaluations and management recommendations, were prepared (ACI 1991, ACI 1992a). In 1992, the KSC North Area (Option 3) was surveyed, with a focus on the land situated west of SR-3 (Kennedy Parkway North) (ACI 1992b). In 1996, the final season of work incident to the KSC-wide predictive model survey focused on the land east of SR-3 exclusive of CNS.

In summary, between 1990 and 1996, the KSC-wide predictive model was formulated and refined by means of a reconnaissance-level archaeological field survey of a sample (5-6%) of land in all environmental zones within the Industrial, VAB, LC-39, SLF, and KSC South and North Areas. In total, 84 sample parcels covering 1,564 ha (3,865 ac) were systematically surveyed. As a result, **50** previously recorded sites were relocated and assessed and **50** newly identified resources were recorded and evaluated (ACI 1990, 1991, 1992a, 1992b, 1996). The results of these investigations are summarized in **Table 3-2**. A brief description of survey findings for each area is discussed below.

Industrial and VAB Areas (1990). An archaeological survey was conducted to test the site location predictive model. A total of 10 parcels within both areas were selected for archaeological field survey, covering approximately 10% (300 ha [740 ac]) of the study area.

Roughly 40% of the Industrial Area is developed. Undeveloped portions are characterized by a mixture of salt marsh community proximate to the Banana River; a "dune and swale" environmental zone characterized by a series of parallel, low ridges separated by seasonally inundated linear sloughs; pine flatwoods; and cabbage palm savannahs. No new sites were discovered within the Industrial Area. Much of the northern portion of the VAB Area has been developed and approximately one-third had been surveyed previously. Undeveloped land is similar in character to the Industrial Area. As a result of field survey, one small lithic scatter type site was discovered along a low ridge in the "dune and swale" community, and one previously recorded site was relocated within an oak/cabbage palm hammock fronting the Banana River. The largely negative findings in both the Industrial and VAB Areas suggest the relative unattractiveness of this land for aboriginal settlement, with the exception of isolated areas of riverine oak/palm hammock and better drained interior ridges of high relative elevation within the VAB Area. **The entire 1,416 ha (3,500 ac) Industrial Area was concluded to have a low potential for archaeological site occurrence. The majority of the VAB area was determined to have**

RELEASED - Printed documents may be obsolete; validate prior to use.

low archaeological site occurrence. Ridge tops of Pomello sand and patch scrub vegetation were given a moderate ZAP designation.

LC-39 Area (1991). The 8,094 ha (20,000 ac) LC-39 area was subjected to a reconnaissance level archaeological survey in 1991. Excluding zones of extensive wetlands, developed operational areas (e.g., LC-39 and LC-41), and localities of restricted access, the actual area available for archaeological survey was roughly 2,833 ha (7,000 ac). Survey coverage was about 12% of the non-wetland areas. In general, the Launch Complex Area is characterized by a mosaic of diverse environmental niches, including coastal dunes along the Atlantic Ocean, interior "dune and swale" areas, pine flatwoods, and scrub-vegetated ridges proximate to creeks. As a result of field survey, **eight** new artifact scatter and midden type sites were discovered. The relatively elevated, better drained lands adjacent or proximate to the Banana River, Banana Creek, or a tributary stream, were found to have a positive site correlation. Similarly, within the Atlantic coastal strand, the parallel beach ridges situated west of Cape Road and proximate to the Banana River were found to be a high probability zone. **All wetland areas, as well as pine flatwoods, "dune and swale" environments, cabbage palm savannahs, and xeric scrub lands distant from a source of fresh water were demonstrated to have a low potential for aboriginal site location.**

Shuttle Landing and KSC South Areas (1991). Of the total 20,235 ha (50,000 ac), over 50% is characterized by wetlands. Survey coverage was approximately 5% of the non-wetland area. The Shuttle Landing Area is generally level and poorly drained, with extensive areas of submerged marsh. The only topographic relief is found along the low, scrub-vegetated ridges, which are located near and parallel to the Kennedy Parkway. The KSC South Area is also mostly low and wet, with pine flatwoods, wet hammocks, salt marsh, and freshwater marshes and sloughs. With few exceptions, the frontage along the Banana River in this portion of KSC is level, poorly drained, and characterized by a pine flatwoods vegetation community. The results of archaeological survey were consistent with the previous seasons of predictive model field testing. The one site discovered in the KSC South Area is located in a remnant oak/palm hammock adjacent to the Banana River. **With isolated exceptions, both the Shuttle Landing and KSC South Areas were concluded to have a generally low potential for precontact site location.**

KSC North Area (1992 and 1996). This area was generally found to be the most archaeologically productive. About 60% of the recorded sites and 80% of the newly discovered sites are situated within this 10,118 ha (25,000 ac) zone. A diversity of environments characterize the KSC North Area, including excessively drained sandhills of relatively high relief, expanses of interior hardwood hammock, and a narrow belt of live oak/cabbage palm/cedar hammock along the western shore of Mosquito Lagoon. This area, situated outside the operational portion of KSC, is largely undeveloped and managed as a wildlife refuge. Alterations include a network of dikes constructed for mosquito control, as well as both the Old Haulover Canal and the New Haulover Canal, which crosscut the narrowest part of the mainland, connecting the Indian River and Mosquito Lagoon. The two field surveys collectively resulted in the discovery of **40** new sites, including 16 artifact scatters, 11 shell and black dirt middens, 1 lithic scatter, 7 single artifact finds, 1 multi-component site, and 4 historic cemeteries. Environments found to correlate positively with precontact site location include sandy ridges proximate to the Indian River, riverine hammocks, interior hardwood hammocks, the droughty sandhills located within 100 m (328 ft) of a wetland, and the oak/palm/cedar hammocks along the shoreline of Mosquito Lagoon. **The KSC North Area is considered to have moderate to high potential for precontact archaeological sites.**

Summary. Based upon the results of this multi-year study, the following environments throughout KSC were found to have a high or moderate potential for the location of precontact period archaeological sites:

- Riverine and creekside oak/cabbage palm hammocks
- Scrub-vegetated ridges of well-drained sand within the Atlantic coastal strand
- Interior hardwood hammocks of higher relief
- Coastal hammocks along Mosquito Lagoon
- Mangrove islands within Mosquito Lagoon
- Low, well-drained sandy inland ridges proximate to (within 200 m [656 ft]) a fresh water source

In contrast, the following environments are not associated with precontact site location:

- Coastal beaches
- Tidal marsh and swamp

RELEASED - Printed documents may be obsolete; validate prior to use.

- Dune and swale
- Pine flatwoods
- Wet hammocks
- Cabbage palm savannahs
- High, droughty sandhills/xeric scrub land distant (> 200 m [656 ft]) from fresh water
- Freshwater marsh and swamp

A set of USGS quadrangle maps marked with the locations of high and moderate ZAPs is on file at the office of the HPO. These data have also been digitized and entered as a layer in KSC's GIS database. Specific parcels subjected to field survey, as well as site locations, are illustrated in the five survey reports produced as part of this study (ACI 1990, 1991, 1992a, 1992b, 1996), also on file at the office of the HPO.

3.2.4 Predictive Model Update

In 2007-2008, ACI initiated a study of the last 200 years of KSC's history, including the development of a historic context and expansion of the predictive model to include historic period archaeological sites, circa 1700 to 1958. Work included archival research, informant interviews, and a limited field reconnaissance to ground-truth the predictive model. A total of **126** historic ZAPs were identified within KSC (ACI 2008). The historic context for KSC is contained in **Appendix B-2**, along with the precontact context (**Appendix B-1**) and Space Program context (**Appendix B-3**). In addition, a layer for the GIS database was prepared, current as of September 2008. As new construction or restoration projects are proposed to support NASA missions, potential historic period archaeological sites will be surveyed and evaluated, recorded in the FMSF, and added to the predictive model.

RELEASED - Printed documents may be obsolete; validate prior to use.

Table 3-2. Summary of Results for the KSC-wide Archaeological Survey, 1990-1996.

KSC AREA	TOTAL AREA ha (ac)	SURVEY PARCELS	AREA SURVEYED ha (ac)	SHOVEL TESTS	KNOWN SITES	NEW SITES	TOTAL SITES
VAB	1,821 (4,500)	5	158 (390)	174	2	1	3
Industrial	1,416 (3,500)	5	142 (350)	215	1	0	1
LC-39	8,094 (20,000)	9	332 (820)	459	6	8	14
Shuttle Landing and KSC South	20,234 (50,000)	33	465 (1,150)	423	12	1	13
KSC North	10,117 (25,000)	32	467 (1,155)	851	29	40	69
Totals	**41,683 (103,000)**	**84**	**1564 (3,865)**	**2,122**	**50**	**50**	**100**

RELEASED - Printed documents may be obsolete; validate prior to use.

3.2.5 Mitigative Archaeological Excavation

The Opposite Futch Cove Site (8BR170), identified by Richard Smith in 1973 as part of the Space Shuttle Runway survey, was determined eligible for listing in the NRHP by the SHPO. In 1988, prior to the development of the VIP Viewing Facility at the site of 8BR170, NASA KSC prepared a mitigation plan for review by the SHPO. It was determined that the proposed construction project would have No Adverse Effect conditioned upon data recovery and preparation of a summary report. In February 1988, a Phase II test excavation was conducted by FAS (Ste. Claire and Johnson 1988), followed by a Phase III mitigative excavation in April and May (Johnson 1992). Phase II and III excavations were performed under the direction of Robert E. Johnson, FAS.

To date, no other archaeological sites at KSC, which are listed or determined eligible for listing in the NRHP, have required mitigative data recovery or other mitigation measures.

3.2.6 Partnerships and Other Accomplishments

KSC has successfully entered into working partnerships with local governments as well as with other federal agencies to cooperatively advance two historic preservation initiatives, as described below.

In September and October 2006, members of the Indian River Anthropological Society (IRAS) conducted a Phase I archaeological survey of the area (0.2 ha [0.5 ac]) around the Clifton Schoolhouse, which had recently been removed from the site. This work was not part of a KSC undertaking, but was accomplished under an ARPA permit issued by NPS and SEAC. The purpose of this investigation was to identify and assess the potential for buried cultural deposits or features associated with the structure (Penders 2008). As a result of systematic surface reconnaissance and subsurface testing, a diffuse artifact scatter containing both precontact and historic period cultural materials was identified and recorded as **8BR2229**. The site was found to extend into the location of the previously recorded Mt. Zion/Campbell-Jackson Cemetery (**8BR1676**). In addition to the Clifton Schoolhouse Archaeological Site (**8BR2229**), IRAS recorded the historic New Smyrna to Haulover Canal Road (**8BR2230/VO8880**), which is located within the alignment of today's SR-3. It was determined that this area has the potential for more cultural resources in the immediate vicinity. Since the community of Clifton surrounded the schoolhouse, a systematic survey of the area could identify other homesteads and history of the area.

In 2006, NASA KSC and the Brevard County Board of County Commissioners executed a Non-Reimbursable Space Act Agreement to transfer the remains of the **Clifton Schoolhouse** from NASA KSC to the Brevard County government (**Exhibit 3-2**). This is a permanent transfer and NASA will relinquish all rights and ownership of the remains to the County. The Clifton School was built ca. 1890 by pioneer settlers Butler Campbell and Andrew Jackson. It was used as a school between 1890 and 1915; between 1916 and the early 1960s, the former schoolhouse was the residence of Eugenia Campbell, daughter of Butler Campbell. Prior to its removal, the structure was in a ruinous state and not eligible for listing in the NRHP given the lack of structural integrity. The partnership with Brevard County allowed them to remove the remains of the structure to reconstruct the schoolhouse at another location in the County. The County plans to restore the structure to its 1890s appearance. Descendants of the pioneer Campbell family and the North Brevard Heritage Foundation, Inc. have volunteered to provide in-kind services to accomplish this task. When completed, the restored schoolhouse will become part of the Heritage Park Complex at the Chain of Lakes Project in Titusville. It will serve as an African American living school museum providing history about the African American education system and teachers of Brevard County. After restoration, the Brevard County Parks and Recreation Department will be responsible for the operation and maintenance. The Brevard County Historical Commission provided NASA KSC with a roadside marker, erected by the CNS, opposite the original site of the schoolhouse.

In July 2008, a Statement of Work was executed among the NPS/SEAC, CNS, NASA KSC, and MINWR for "Archaeological Survey, Investigation and Evaluation of Elliot's Plantation in Support of a National Register Nomination". The proposed work, to be conducted by SEAC under a Memorandum of Understanding (MOU) between CNS and MINWR, focused on two historic plantation sites located within KSC: the Sugar Mill Ruins (**8VO160**) and Ross Hammock (**8VO2569**). Three weeks of field survey, supervised by SEAC archaeologist Dr. Margo Schwadron was completed in August 2008 (**Section 4.3.2**). Methods of this investigation included systematic surface reconnaissance and subsurface testing, digital mapping, and photographic

RELEASED - Printed documents may be obsolete; validate prior to use.

documentation. All artifacts collected are the property of NASA. Curation of artifacts and records will be the responsibility of SEAC under the terms of an existing agreement.

In addition, a request for a new FMSF number for the Elliot Plantation Complex was submitted by Dr. Margo Schwadron on March 15, 2013. Previously recorded sites (**8VO160, 8VO130, 8VO131, 8VO213, and 8VO2569**) are part of one large multi-component site, which relate in archaeological and historical context and temporal association. The boundary for the 1046 ha (2,585 ac) site was based on subsurface shovel testing, controlled surface collection, metal detector survey, topographic mapping, 3D LiDar scanning, pedestrian survey, and excavations, as well as historical land grants for the property. The Ross Hammock Complex, Sugar Factory, and Sugar Factory Village Complex have the greatest concentrations of features, but the entire complex containing miles of slave-built canals, irrigation ditches, old fields, gardens, roads, paths, slave villages, and indigo and sugar production areas should be considered a cultural landscape (Schwadron 2013).

3.3 HISTORIC FACILITIES SURVEYS

3.3.1 The Launch Complex 39 (LC-39) Site

In May 1973, the LC-39 Site became the first KSC site to be listed in the NRHP. The nomination, which highlighted the national significance of the principal facilities associated with the Apollo Manned Lunar Landing Program, was prepared the previous year by George M. Hawkins, Chief of the Documentation and Data Management Branch of KSC. A copy of the original nomination is provided in **Appendix C**. LC-39, built between November 1962 and October 1968, was evaluated as significant in the areas of architecture, communications, engineering, industry, science, transportation, and space exploration.

As originally defined, the boundaries of the NRHP site encompassed a rectangle measuring approximately 2,833 ha (7,000 ac) in areal extent. The significant properties, which comprise the site, as enumerated in the nomination, include the VAB, LCC, Crawlers, Crawlerway, and the LC-39 Launch Complexes A and B, including the elevated launch pads, storage tanks, and associated servicing and control equipment. Although additional KSC facilities, containing those in the Industrial Area, actively supported the Apollo Program, none was included in the NRHP Site.

3.3.2 LC-39 Site Reassessment and Historic Facilities Survey

In 1996-1997, a historical/architectural survey of the Industrial, LC-39, VAB, and SLF Areas of KSC was conducted by ACI. The survey included a total of 696 NASA-controlled facilities (ACI 1998a). One primary focus of this investigation was the reassessment of the original LC-39 Site, which contained a total of 322 facilities within its boundary. Of these, the reevaluation found that 207 (64%) were built and/or sited after the LC-39 Site was listed in the NRHP, including 97 temporary buildings and trailers. In summary, the reassessment found that the majority of individual facilities within the existing 2,833 ha (7,000 ac) NRHP Site were not associated with the historically important events of the Apollo Program; were not dated to the period of significance for the historic property (1961-1975); were not distinguished for their historical, engineering and/or architectural values; and/or had suffered a substantial loss of integrity, which made them no longer eligible for NRHP listing.

As a result, the original nomination was amended, the boundary of the original LC-39 Site was removed, and a new NRHP Multiple Property nomination for a number of buildings, structures, districts, and objects considered to be of exceptional national importance within the context of the Apollo Program was prepared. This amendment to the original nomination was directed at identifying those historic properties subject to NASA's Section 106 review and compliance under the NHPA, while at the same time, deleting those facilities that do not represent or embody the significant historical values that make these properties eligible for listing in the NRHP.

The first step in evaluating the facilities was to establish and describe the applicable historic contexts and subcontexts, drawing from the manned space programs associated with KSC: Apollo and Space Shuttle. At the time of survey, recognition was given to the fact that the Space Shuttle Program was active and that proper assessment of its national impact was inappropriate until such time as the program had concluded (Harry Butowsky, personal communication). Consequently, the survey and reassessment focused on the facilities of exceptional importance to the Apollo Program, from 1961 through 1975, including three subcontexts: Apollo

RELEASED - Printed documents may be obsolete; validate prior to use.

Manned Lunar Landing Program, 1961-1972; Skylab Space Station, 1973-1974, (1979); and Apollo-Soyuz Test Project, 1975.

A Multiple Property nomination was selected as the most appropriate means by which the significant properties identified could be nominated to the National Register. Information common to the group of properties is presented in the Multiple Property Documentation Form (the "cover" nomination), which was prepared and submitted separately, while information specific to each individual building, site, structure, object, or district was placed on the individual registration forms, also submitted with the Multiple Property cover. An advantage of this approach is that the Multiple Property nomination, which groups related significant properties, facilitates the evaluation of individual properties by comparing them with resources that share similar physical characteristics and historical associations. In addition, the Multiple Property nomination is a flexible document permitting additional contexts and resources to be added as they become eligible.

The NRHP Multiple Property nomination took a thematic approach, focusing on the Apollo-era Manned Space Program as an exceptionally important historic event and the KSC facilities that best represent it. The period of significance spans 1961 through 1975, from the time of initial preparations to the last operational flight. Many original Apollo-era facilities were used during the Space Shuttle Program. Some facilities were altered to support the program, while others have been discarded or dismantled. Eligibility requirements were, therefore, structured to accommodate these considerations, particularly with regard to the issue of integrity.

The total **322** resources located within the original NRHP LC-39 Site was reduced to **eight** individually eligible resources and **34** facilities considered as contributing to newly identified NRHP historic districts at LC-39 Pads A and B. The VAB, LCC, the Crawlers, the Crawlerway, and Launch Pads A and B were retained from the original nomination. The Headquarters Building, O&C Building, CIF, and the Press Site: Clock and Flag Pole were added as NRHP-eligible properties as a result of this survey. The three Mobile Launcher Platforms (MLPs)/Launch Umbilical Towers (LUTs),, included in the original nomination were no longer considered independently eligible for the NRHP due to their loss of integrity. The Mobile Service Structure (MSS), also included in the original nomination, is no longer extant. Thus, the MLPs/LUTs and the MSS were suggested for delisting and it was recommended to the SHPO that the new Multiple Property submission be accepted to supersede the original (ACI 1998a). Recognizing the ongoing changes in America's Space Program, it was further recommended that, upon the conclusion of the Space Shuttle Program and each succeeding program, facilities be evaluated and amendments be made to the Multiple Property nomination, as appropriate. The Multiple Property nomination was signed by the SHPO in August 1998. A SHPO letter concurring with the determinations of NRHP eligibility is provided in **Exhibit 3-3.**

In 2006, the original Multiple Property Documentation Form, "Historic Cultural Resources of the John F. Kennedy Space Center, Florida," was updated to include a new historic context, the Space Shuttle Program (ca. 1969-2011) and its associated property types. The results of this survey are presented in Section 3.3.4.

3.3.3 Survey of NASA-owned Facilities at CCAFS and NHL Determinations

In September 1983, a revised NHL Federal Agency Nomination was prepared by the NPS History Division at the direction of the Secretary of the Interior's Advisory Board to reflect an agreement between the NPS, the U.S. Air Force, and the Board. The nomination, which highlighted the national significance of those principal facilities associated with the manned and unmanned space programs of the United States, included Launch Pads 5, 6, 13, 14, 19, 26, 34, and the original Mission Control Center (MCC). Of these, **LC-5/6, LC-19, LC-34, and the MCC are NASA-owned properties. The MCC was demolished in 2010. LC-19 was transferred to the Air Force in 2014.** The revised nomination omitted other previously enumerated facilities. At the direction of the Secretary of the Interior's Advisory Board, the boundary of the NHL District included "only the area immediately surrounding" the seven launch pads and the MCC. The NHL, CCAFS Historic District, was listed on April 16, 1984.

A subsequent survey by the U.S. Army Construction Engineering Research Laboratory in 1994 recommended that LC-1/2, 3/4, 17, 21/22, 25, and 31/32 be considered eligible for the NRHP under Criteria A and/or C. Other properties were not considered eligible for the NRHP at that time. **Of these eligible properties, only two, Launch Silo 31-**

RELEASED - Printed documents may be obsolete; validate prior to use.

B (17750) and Launch Silo 32-B (17751), are in NASA ownership.

In 2001, ACI conducted a historical/architectural survey of 106 NASA-owned facilities located within the CCAFS (ACI 2001). However, due to heightened security in the wake of the terrorist activities of September 11, the survey team was not able to examine the interiors of any of the facilities, nor was granted access to historical records housed by the Air Force. Given these constraints, as a result of an incomplete research and field investigation, it was concluded that while the facilities in the CCAFS Industrial Area did not, at that time, appear to meet the NRHP eligibility criteria requiring exceptional significance for a property less than 50 years old, several facilities played a vital role in mating and testing the missile and rocket components in the **Cold War** era programs of missile testing and the military and civilian space program. Due to the lack of supporting data, the survey was never forwarded to the SHPO for evaluation and review. Therefore, it was recommended that all of the facilities, both Air Force and NASA-owned, located in the CCAFS Industrial Area, be reevaluated when the majority attains 50 years of age (ACI 2001).

The Environmental Health/Health Physics Facility/Bioastronautics Operations Support Unit (BOSU) was also surveyed and found to be individually eligible for listing in the NRHP. It is significant for its contributions to the U.S. Manned Space Program as a surgical medical unit located at the north end of the building (ACI 2012).

In 2013, New South Associates conducted a historical/architectural survey of 12 buildings located on CCAFS, but owned by NASA to determine if a historic district existed in the CCAFS Industrial Area. The nine properties within the NRHP-eligible Hangar AF Complex Historic District were also evaluated to determine if those facilities should be incorporated into this potential historic district. These facilities were evaluated for their eligibility to the NRHP both individually and as part of the historic district. The survey resulted in the recommendation that the facilities do form a historic district with a discontiguous boundary and that two of the buildings, Hangar S and Missile Assembly Building AE, are individually eligible for listing in the NRHP and contribute to the new historic district (New South 2013).

3.3.4 Space Shuttle Program and Other Historical Surveys

In 2006, NASA initiated a historical survey and evaluation of all NASA-owned facilities and properties (real property assets) to determine their eligibility for listing in the NRHP in the context of the U.S. Space Shuttle Program (SSP), 1969-2011. KSC was one of 13 NASA Centers and Component Facilities included in this NASA-wide study, which was conducted in compliance with Section 110 of the NHPA of 1966, as amended; the NEPA of 1969; EO 11593; EO 13287; and other relevant legislation. NASA developed the set of standard protocols for evaluating the historical significance of SSP-related facilities at all NASA Centers and Components Facilities (**Exhibit 3-4**).

The evaluation of KSC facilities focused on 112 properties identified by the HPO as potentially significant in the context of the SSP. As a result of research and field survey, **26** assets were considered to individually meet the criteria of eligibility for listing in the NRHP within the context of this study, including 11 buildings, 14 structures, and one object. All meet NRHP Criterion A for their exceptional significance in the context of the SSP, and most also meet Criterion C in the area of Engineering. The total 26 assets include six NRHP-listed properties: the VAB, LCC, Crawlerway, two Crawler Transporters, and the Press Site Clock and Flag Pole. Twenty additional properties were newly assessed as individually eligible. These resources are described in Chapter 4 and include:

- Launch Complexes 39 Pads A and B
- Shuttle Runway
- Landing Aids Control Building (LACB)
- Mate-Demate Device (MDD)
- Orbiter Processing Facility High Bays 1 and 2
- Orbiter Processing Facility High Bay 3
- Thermal Protection System Facility (TPSF)
- Rotation Processing Surge Facility (RPSF)
- Manufacturing Building
- Parachute Refurbishment Facility (PRF)
- Canister Rotation Facility (CRF)
- Hypergol Module Processing (HMP) North
- two Payload Canisters
- two Retrieval Ships *Freedom Star* and *Liberty Star*
- three MLPs

RELEASED - Printed documents may be obsolete; validate prior to use.

Two previously listed historic districts, the LC-39: Pad A Historic District and the LC-39: Pad B Historic District, originally listed for their exceptional significance in the context of the Apollo Program, were also assessed as significant within the context of the SSP. Each district contains **21** contributing resources of which one is individually eligible and 20 are contributing, but not individually eligible. In addition, **four** new historic districts were identified. The SLF Area Historic District contains three properties which are both individually eligible and contributing; the Orbiter Processing Historic District includes three properties which are both individually eligible and contributing; the SRB Disassembly and Refurbishment Complex Historic District contains no individually eligible properties but nine contributing resources; and the Hypergolic Maintenance and Checkout Area (HMCA) Historic District contains two individually eligible properties and one contributing resource.

45-50 Year Historic Survey

In 2012, New South Associates conducted a 45-50 year historic survey of those facilities built in the 1950-60s. Out of the 45 facilities surveyed eight were located on CCAFS with the remaining 37 facilities residing on KSC. **Six** facilities were determined individually eligible and those were the Engineering Development Lab, Missile Assembly Building AE, Beach House, and the three KSC bridges (Banana River, Indian River, and Haulover Canal), and one was considered a contributing resource to the VAB, the Barge Terminal Facility.

Other Architectural Surveys

A historical survey and evaluation of the Space Station Processing Facility (SSPF) was conducted in April 2010 (ACI 2010). This facility was recommended individually eligible for listing in the context of the International Space Station (ISS) Program.

The Jay Jay Bridge, railroad system, locomotives, and rail cars were surveyed in 2012 (ACI 2012). All **seven** assets (three locomotives, two 70-ton aft skirt cars, the Jay Jay Bridge, and a 19-mile railroad segment of the west branch track) were recommended eligible for listing as contributing resources to the newly created NASA KSC Railroad System Historic District.

In 2012 the Hypergol Module Processing (HMP) South Building, in an already identified HMCA Historic District, was surveyed, along with the Boresight Control Building (New South 2012). The HMP South is considered individually eligible and contributing to the HMCA Historic District, while the Boresight Control Building was determined not eligible for listing in the NRHP.

Concurrence letters from the SHPO for these historic surveys and determinations of NRHP eligibility are provided in **Exhibit 3-5**. A list of these significant historic properties along with the eight historic districts is provided in **Chapter 4**, Cultural Resources Inventory.

3.4 DETERMINATIONS OF EFFECT

As part of the environmental checklist, site plan, and excavation review processes, the HPO evaluates projects to determine potential adverse effects to historic properties and archaeological sites. Remediation site studies are also reviewed for impacts to cultural resources. These effect determinations are made in consultation with the SHPO, ACHP, NPS (for NHLs), and interested parties. Prior to the PA (KCA-4185), several MOAs were developed in consultation with the SHPO, ACHP, and NPS as detailed below in Section 3.5. Numerous facility projects are covered under Appendix C of the PA (KCA-4185) and do not require SHPO consultation. An annual report is prepared by KSC to the SHPO pursuant to Stipulation VIII.D of the PA. This report can be found in the CRM NETS Module.

3.5 AGREEMENT DOCUMENTS

3.5.1 Memoranda of Agreement

In 1974, after the end of the Apollo Program and prior to the start of the Space Shuttle Program, an MOA was executed between NASA KSC, the ACHP, and the Florida SHPO, which recognized the ongoing use and need for modification to NRHP-listed LC-39 Site facilities including the VAB, LCC, MLPs, Pads A and B, and the MSS (**Exhibit 3-6**). The MOA permitted NASA KSC to proceed with the design and development of Space Shuttle facilities. The agreement document stipulated that implementation of the undertaking in accordance with a proposal entitled "A Joint Memorandum Concerning Modifications and Additions to Launch Complex 39 (a National Register Site) for the Space Shuttle

RELEASED - Printed documents may be obsolete; validate prior to use.

System" will satisfactorily mitigate any adverse effects. Both modifications to existing facilities, as well as construction of new facilities, were addressed. Among the proposed changes were the disassembly and removal of the LUTs from the MLPs, extensive modification of the MLPs, and dismantlement and removal of the MSS.

Since the MOA was executed, amendments that strengthened the NHPA were made. Additionally, in September 1980, President Carter signed PL 96-344 that specifically called for the identification and preservation of properties representative of America's "Man in Space" Program. As a result, in March 1983, the SHPO recommended that in order to prevent the loss of the Apollo-era LUT at LC-39, it should be carefully disassembled and stored for later reassembly. In 1983, KSC, in compliance with the SHPO's recommendations, dismantled the subject LUT and transported the 18 tower sections, the hammerhead crane arm assembly and crane housing, and eight service arms to an outdoor storage area. Most of the components at this site were disposed of during remediation activities.

In October 1994, a loan agreement (**Exhibit 3-7**) was executed between NASA KSC and the Smithsonian Institution on behalf of the NASM for restoration and movement of the Saturn V launch vehicle. The vehicle had been located outside of the VAB for display since the mid-1970s. It was refurbished in 1996 and relocated to the Apollo/Saturn V Center for display, along with two sections of the LUT and a hammerhead crane arm assembly.

Between 2006 and June 2009, NASA KSC executed MOAs for the ESB at LC34, LCC, and MCC. These agreement documents (**Exhibits 3-8, 3-9,** and **3-10,** respectively**)** stipulate mitigation measures consisting of the preparation of large format photographs and historical narratives, consistent with Historic American Building Survey (HABS)/Historic American Engineering Record (HAER) Level II documentation.

Effective May 2009, KSC no longer prepares MOAs for individual undertakings, with the exception of NHL properties, resulting in adverse effects to historic properties, but rather applies the relevant stipulations of the PA.

3.5.2 Programmatic Agreements

In October 1989, a "Programmatic Agreement Regarding Facilities Designated as National Historic Landmarks" (**Exhibit 3-11)** was executed among NASA, the National Conference of State Historic Preservation Officers, and the ACHP. It applied to 20 NHLs, designated as of February 24, 1989; none of the NHLs are located on KSC. The nationwide PA specified the types of undertakings, which would require consultation under Section 106 of the NHPA and stipulated two types of mitigation measures, recordation and salvage.

On May 18, 2009, a "Programmatic Agreement Regarding Management of Historic Properties at KSC" (**Exhibit 3-12**) was executed among NASA KSC, the ACHP, and the SHPO (KCA-4185). This agreement document was developed pursuant to Section 800.14 of the regulations, which implement Section 106 of the NHPA. The PA defines categories of undertakings that are exempt from Section 106 review, as well as those requiring consultation with the SHPO and ACHP. It also outlines a number of mitigation options, including recordation or performing early historic documentation, salvage, public interpretation, offsite mitigation, and adaptive reuse. Execution of this PA now allows KSC to streamline its compliance with Section 106.

3.6 MITIGATION MEASURES FOR HISTORIC FACILITIES

3.6.1 HABS/HAER Documentation

Between 2006 and 2014, thirty-four mitigation projects consisting of the preparation of large format photographs and historical narratives consistent with HABS/HAER Level II or III documentation standards were completed or initiated (KSC Mitigation Plan, **Exhibit 3-13**). These projects were accomplished either as set forth in the stipulations of formal MOAs, or in accordance with the 2009 PA. Typically KSC prepares Level II HABS/HAER documents for individually eligible or listed facilities and uses Level III standards when the facility is a contributing resource.

In 2008, the HPO and the SHPO reached verbal agreement to document only one of each of the significant "multiple" properties at KSC, as long as they are at least 95% identical. This agreement language is found in Stipulation V.A.2 of the PA (**Exhibit 3-12**). The multiple properties at KSC

RELEASED - Printed documents may be obsolete; validate prior to use.

include the three OPF high bays, the three MLPs, the two launch pads, two Crawler Transporters, two Payload Canisters, and the two SRB retrieval ships. In addition to these facilities, it was also agreed that the four firing rooms in the LCC, as well as the four high bays in the VAB, constitute multiple resources. Therefore, mitigation measures in fulfillment of Section 106 obligations focused on one of each facility/component type to represent all the assets in the group.

3.6.2 Other Mitigation Measures

Additional mitigation measures taken at KSC have included the development of websites, inventories, installation of markers, creation of DVDs, and salvage of artifacts for public interpretation and display. These mitigation measures are summarized in **Table 3-3**.

Prior to demolition of the MCC (2010), in accordance with Stipulation II.C of the MOA, in March 2009, ACI inventoried and evaluated all historic artifacts located within the MCC Flight Control Area (Room 253) and the adjacent historically significant portions of the MCC (Rooms 250, 223, 222, 221, 221A, and Support Area), as defined in the NHL nomination. Also inventoried were the original Control Room consoles and equipment removed in October 1999 that were installed in the Early Space Exploration (ESE) Exhibit at the KSC Visitor Complex. Other mitigation measures stipulated in the MOA, including the placement of a State Historic Marker, augmentation of the displays at the ESE Exhibit, development of a MCC Web site, and production of a digital video disc (DVD)/video documenting the MCC have also been accomplished.

The MCC DVD was completed by the KSC Public Affairs Office and the KSC TV Multimedia Productions Group. The 20 minute video highlights the building itself, the role the facility played in the early space exploration programs, and also incorporated current and historic recordings. The DVD can be viewed at http://www.nasa.gov/enters/kennedy/about/history/MCCgallery/index.htm. In 2011, the website went live and a historic marker was placed at the original site. The remaining mitigation for KSC to complete is the augmentation of the ESE Exhibit. If the exhibit is modified or moved, the SHPO and NPS will have an opportunity to comment on a new display layout.

For the proposed upgrades to the LCC Firing Rooms, the following mitigation measures were agreed upon between KSC and the SHPO in accordance with Stipulation IV.A of the PA:

- Development of a website (http://www.nasa.gov/content/launch-control-center-home-page/) (completed 2014).
- Production of a virtual tour of the LCC and Firing Rooms (completed 2014 and found on the website).
- Installation of original consoles at the KSC Visitor Complex Orbiter Home exhibit.
- Inventory of Firing Room #2 and historic property (in work).
- Optional: Creation of a firing room model.

In 2014, Hangar S was found individually eligible and contributing to the newly found NASA-owned CCAFS Industrial Area Historic District. Since NASA plans to demolish the property in 2016, KSC is being proactive with the following mitigation:

- Historic Recordation (Level II) of the hangar that will be provided to the SHPO, NPS (Library of Congress) for public viewing (completed in 2014).
- Development of a website (in work).
- Salvage of artifacts for public interpretation/display (to be removed prior to demolition activities).

RELEASED - Printed documents may be obsolete; validate prior to use.

Table 3-3. Mitigation Measures for Undertakings Initiated by NASA KSC between 2006 and 2014.

Historic Property	Undertaking/Mitigation Measures	Documentation Accepted by NPS/ FL SHPO
M7-657/Parachute Refurbishment Facility, 8BR2014	Disposal of equipment in PRF and preparation for demo (2012). Level II HAER completed as mitigation measures for this project.	HAER FL-8-11-Q NPS – 8/15/2014 FL SHPO – 4/12/2013
Hypergol Maintenance and Checkout Area Historic District, 8BR2015	Demolition of HMP North and Hypergol Support Building and proposed lease agreement for HMP South (2013). Level II HAER completed as mitigation.	HAER FL-8-11-T NPS – 10/23/2014 FL SHPO – 9/26/2014
K6-947/VAB Utility Annex, 8BR1684 K7-1005/Barge Terminal Facility, 8BR2986	Proposed mods and construction of a new addition to the Annex (2012). Level II HAER was completed as mitigation.	HAER FL-8-11-B Addendum NPS – 8/15/2014 FL SHPO – 6/6/2014
M7-0409/Engineering Development Laboratory, 8BR2969	Early mitigation measures performed; no proposed action to date. Level II HABS was completed for future mitigation.	HABS FL-8-581-C NPS – 8/15/2014 FL SHPO – 6/6/2014
E4-2414/Haulover Canal Bridge, 8BR2957 M7-1150/Banana River Bridge, 8BR2955 M3-0003/Indian River Bridge, 8BR2956	Early mitigation measures performed; no proposed action to date. Bridges considered multiple asset under Stipulation V.2 of PA. Level II HAER was completed for future mitigation.	HAER FL-8-C NPS – 8/15/2014 FL SHPO – 6/6/2014
60680/Missile Assembly Building (Hangar AE), 8BR2976	Early mitigation measures performed; no proposed action to date. Level II HAER was completed for future mitigation.	HAER FL-8-B NPS – 10/23/2014 FL SHPO – awaiting concurrence
K8-1699/Beach House, 8BR2990	Early mitigation measures performed; no proposed action to date. Level II HAER was completed for future mitigation.	HABS FL-583-B NPS 10/23/2014 FL SHPO – awaiting concurrence
1726/Hangar S, 8BR3070	Proposed demolition (2012/2014). Level II HABS was completed for this project. Other mitigation measures to be completed by NASA are website development and removal of artifacts.	HABS – TBD NPS – FL SHPO -
55005/Hangar M Annex, 8BR2972	Proposed demolition (2014). Level II HABS/HAER is underway as mitigation for this project.	HABS/HAER – TBD NPS – FL SHPO –

Recordation Completed	Acceptance letters from both the FL SHPO and NPS have been received.

RELEASED - Printed documents may be obsolete; validate prior to use.

Table 3-3. Mitigation Measures for Undertakings Initiated by NASA KSC between 2006 and 2014 (cont.).

Historic Property	Undertaking/Mitigation Measures	Documentation Accepted by NPS/ FL SHPO
60540/Solar Array Test Building, 8BR2977	Proposed demolition (2014). Level III HABS/HAER is underway as mitigation for this project.	HABS/HAER – TBD NPS – FL SHPO –
60650/Engineering and Operations (E&O) Building	Transfer of property to the United States Air Force (USAF) in 2014. Level II HABS completed as mitigation.	HABS FL-583-C NPS – FL SHPO -
K6-0848/Vehicle Assembly Building, 8BR1684	Damage to VAB (2004), removal of High Bay 3 platforms (2006), and demolition and new construction in High Bay 4 (2013). Level II HAER was completed as mitigation.	HAER FL-8-11-B NPS – 8/10/2009 FL SHPO – 10/2/2009
SRB Disassembly and Refurbishment Complex Historic District (includes 9 contributing resources), 8BR1996	Mods to Hangar AF Slip (2006), proposed demolition of 3 contributing resources (2012), and disposal of Shuttlelift at SRB Slip area (2012). Level II HAER was completed as mitigation.	HAER FL-8-11-S NPS – 2/6/2014 FL SHPO – 11/18/2013
L6-0247/SRB ARF Manufacturing Building, 8BR1998	Early mitigation measures performed; no proposed action to date. Level II HAER was completed for future mitigation.	HAER FL-8-11-R NPS – 1/30/2014 FL SHPO – 4/12/2013
49635/Environmental Health/Health Physics Facility (also known as the Bioastronautics Operations Support Unit/BOSU), 8BR2905	Demolition activities (2013). Level II HABS was completed as mitigation.	HABS FL-583-1 NPS – 11/7/2013 FL SHPO – 5/3/2013
NASA KSC Railroad System Historic District, 8BR2932	Excess and transfer of railroad systems (2013). Level II HAER was completed as mitigation.	HAER FL-8-A NPS – 11/7/2013 FL SHPO – 5/3/2013
M6-342/Central Instrumentation Facility, 8BR1692	Proposed demolition and relocation of historic labs (2012). Level II HAER was completed as mitigation.	HABS FL-581-B NPS – 4/15/2013 FL SHPO – 2/6/2013
M6-0399/Headquarters Building, 8BR1691	Mods to administrative areas (2004), proposed demolition (2011). Level II HABS was completed as mitigation.	HABS FL-581-A NPS- 1/17/2013 FL SHPO – 12/13/2012
UK-008/Crawlerway, 8BR1689	Construction of Horizontal Integration Facility (reference LC39A) (2014). Level II HABS was completed as mitigation.	HAER FL-8-11-P NPS – 11/27/2012 FL SHPO – 10/19/2012
K6-696/Orbiter Processing Facility High Bay 3 (includes the Space Shuttle Main Engine Processing Facility), 8BR1990	Implementation of Use Permit (including demo) for OPF-3/SSME (2011), preparation for lease agreement for commercial entity for OPF-1/2 including demo (2012). Level II HAER was completed as mitigation.	HAER FL-8-11-O NPS – 4/30/2012 FL SHPO – 2/23/2012

Recordation Completed	Acceptance letters from both the FL SHPO and NPS have been receied.

RELEASED - Printed documents may be obsolete; validate prior to use.

Table 3-3. Mitigation Measures for Undertakings Initiated by NASA KSC between 2006 and 2014 (cont.).

Historic Property	Undertaking/Mitigation Measures	Documentation Accepted by NPS/ FL SHPO
Press Site: Clock and Flag Pole, 8BR1690	Replacement of clock (2014). Level II HAER was completed as mitigation.	HAER FL-8-11-N NPS – 4/30/2012 FL SHPO – 2/23/2012
M7-0360/Space Station Processing Facility, 8BR2671	Disposal of payload equipment in SSPF (2011). Level II HAER was completed as mitigation.	HAER FL-8-11-M NPS – 11/30/2011 FL SHPO – 11/21/2011
M7-0777/Canister Rotation Facility, 8BR2016	Exterior/interior mods (2010). Level II HAER was completed as mitigation.	HAER FL-8-11-K NPS – 8/25/2011 FL SHPO – 6/7/2011
Shuttle Landing Facility Historic District (includes Mate-Demate Device, Shuttle Runway, and Landing Aids Control Building), 8BR1986	Demolition of Mate-Demate Device (2011), expansion of the SLF support area for NASA and commercial entities (2012). Level II HAER was completed as mitigation.	HAER FL-8-11-J NPS – 12/08/2011 FL SHPO – 6/7/2011
K6-0494/Rotation/Processing Facility, 8BR1997	Early mitigation measures performed; no proposed action to date. Level II HAER was completed for future mitigation.	HAER FL-8-11-G NPS – 10/31/2011 FL SHPO – 9/21/2011
K6-0794/Thermal Protection System Facility, 8BR1994	Early mitigation measures performed; no proposed action to date. Level II HAER was completed for future mitigation.	HAER FL-8-11-L NPS – 8/25/2011 FL SHPO – 6/7/2011
Orbiter Payload Canister, 8BR2017	Demolition (2010). Level II HAER was completed as mitigation.	HAER FL-8-11-I NPS – 9/28/2011 FL SHPO – 9/21/2011
Launch Complex 39A Historic District, 8BR1686	Mods to LC39B (2006) considered multiple asset under Stipulation V.2 of PA, repairs to flame trench (2008), demolition of 5 contributing resources (2012), removal and storage of emergency egress baskets and slide wire system, dog house structures on camera pads, relocate the photo optical control system camera terminal cabinet and tracker control cabinet from camera pads (2012), Complex placed in an abandoned mode, removal of historic elements (arms, clean room, etc.), and 20-year lease agreement with Space X. In addition to the lease agreement, construction of a Horizontal Integration Facility (2014). Level II HAER was completed as mitigation.	HAER FL-8-11-F NPS – 9/08/2010 FL SHPO – 10/13/2010

Recordation Completed	Acceptance letters from both the FL SHPO and NPS have been received.

RELEASED - Printed documents may be obsolete; validate prior to use.

Table 3-3. Mitigation Measures for Undertakings Initiated by NASA KSC between 2006 and 2014 (cont.).

Historic Property	Undertaking/ Mitigation Measures	Documentation Accepted by NPS/ FL SHPO
M7-355/Operations and Checkout Building, 8BR1693 (including the disposal of Cargo Integration Test Equipment [CITE] Stands and Apollo Test Module [ATM] Clean Room)	Proposed high bay changes to support the Orion Program, removal of contributing elements (2009), mods to the Administrative office areas (2004), new Visitor Viewing Gallery (2009), and mods to the exterior back, side and front entrance of the building (2013). Level II HAER was completed as mitigation.	HAER FL-8-11-E NPS – 11/7/2013 FL SHPO – 5/3/2013
M7-0355/O&C Altitude Chambers, 8BR1693	Proposed mods (2009). Level II HAER was completed as mitigation measures for this project.	HAER FL-8-11-E NPS – 1/28/2010 FL SHPO – 3/02/2010
K6-900/Launch Control Center, 8BR1685	Modifications to FR #1 (2006), removal of sun louvers and replacement of windows and bow trusses (2007), proposed removal and storage of consoles from LCC FR #2 and possible mods to FR #4 (2012), and mods to FR #3 (2012). Level II HAER was completed as mitigation. Inventory of artifacts, and website development are to be completed by NASA KSC.	HAER FL-8-11-A NPS – 4/1/2009 FL SHPO – 3/26/2010
Mobile Launcher Platform, 8BR 2021	Mods to MLP-1 (2006) and disposal of assets (2010). Level II HAER was completed as mitigation.	HAER FL-8-11-D NPS – 1/5/2010 FL SHPO – 12/8/2009
Crawler Transporters, 8BR1688	Early mitigation measures performed; no proposed action to date.	HAER FL-8-11-C NPS – 11/13/2009 FL SHPO – 12/8/2009
01385/Mission Control Center, 8BR2590	Demolition (2010). Level II HAER completed as mitigation measures for this project. Other mitigation measures completed by NASA KSC are artifact identification (2009), installation of historic marker (2010), development of DVD (2013), augmentation of exhibit area (outstanding), possible relocation or modification of exhibit (outstanding).	HAER FL-8-AV NPS – 9/2/2010 FL SHPO – 8/20/2010
21900H/LC-34 Engineering Support Building, 8BR2091	Demolition (2007) Level II HAER completed as mitigation.	HAER FL-8-AN Not forwarded to NPS FL SHPO – 7/17/2008

Recordation Completed	Acceptance letters from both the FL SHPO and NPS have been received.

RELEASED - Printed documents may be obsolete; validate prior to use.

3.7 FORESEEABLE UNDERTAKINGS

KSC is in the process of transforming into a multi-user spaceport to support NASA's vision for the Nation's space program. In order to reduce the footprint and reduce operational costs, some facilities will be modified, including the removal and replacement of equipment, while other facilities will be closed, abandoned in place, demolished, or leased to commercial or governmental entities. These foreseeable undertakings will affect some of KSC's historic properties which may require consultation with the SHPO, ACHP, or NPS (for NHLs) under the PA or Section 106 of the NHPA. To streamline the Section 106 review process, the KSC Environmental Management Branch has proactively undertaken HABS/HAER Level II documentation of historic properties scheduled for modification or demolition**.**

Archaeological surveys have been performed on only a small percentage of NASA owned land at KSC. When new construction projects are proposed, the Predictive Model becomes a useful management tool for determining the potential for impact of historic areas and when surveys need to be conducted.

3.8 STATUTORY REPORTING REQUIREMENTS

Every three years, a report is prepared by the NASA Headquarters FPO to the ACHP in response to EO 13287, Preserve America. Each Center HPO answers a set of questions in the CRM NETS Module. These questions cover the protection and use of historic properties, including changes to policies and guidelines, and number of historic properties leased, or demolished; heritage tourism as far as activities and events that took place; and CRM training attended. A copy of KSC's report can be found in the CRM NETS Module and the final NASA rollup report is posted on the ACHP website.

KSC also responds annually to the ARPA data call requested by the NASA FPO for the NPS. This call facilitates the evaluation of Agency success in addressing strategic and policy issues, planning for future activities, understanding the challenges of archaeological resources stewardship, and improving communication, cooperation, and exchange of information between Federal authorities for the protection of archaeological resources. A copy of the KSC report can be found in the CRM NETS Module and a final NASA rollup report is provided to the National Park Service Chief Archaeologist.

As requested, KSC prepares NHL condition assessment reports for the NPS. The last report was prepared in 2008. This report determines if any landmark is in immediate danger of neglect.

3.9 AWARDS

NASA KSC was selected for the 2013 American Cultural Resources Association (ACRA) Industry Award – Public Sector. The award honored KSC as an ACRA public sector client who has shown a commitment above and beyond what is required to meet laws and regulations pertaining to the preservation of cultural resources. KSC received the award for extensive historic resource documentation and early recordation efforts, which help ensure NASA's distinguished history of space exploration is preserved. KSC was nominated for the award by New South Associates, Inc. and Archaeological Consultants, Inc.

.

RELEASED - Printed documents may be obsolete; validate prior to use.

EXHIBIT 3-1
SHPO CORRESPONDENCE REGARDING ARCHAEOLOGICAL SURVEYS TO ESTABLISH ZONES OF ARCHAEOLOGICAL POTENTIAL

RELEASED - Printed documents may be obsolete; validate prior to use.

FLORIDA DEPARTMENT OF STATE
Jim Smith
Secretary of State
DIVISION OF HISTORICAL RESOURCES
R.A. Gray Building
500 South Bronough
Tallahassee, Florida 32399-0250
Director's Office (904) 488-1480
Telecopier Number (FAX) (904) 488-3353

August 29, 1990

Ms. Joan Deming
Archaeological Consultants Inc.
P. O. Box 5103
Sarasota, Florida 34277-5103

In Reply Refer To:
Laura A. Kammerer
Historic Sites
Specialist
(904) 487-2333
Project File No. 902439

RE: Cultural Resource Assessment Review Request "Archaeological Survey to Establish Zones of Archaeological Potential (ZAPs) in the VAB and Industrial Areas of the Kennedy Space Center", (July 1990).

Dear Joan:

In accordance with the procedures contained in 36 C.F.R., Part 800 ("Protection of Historic Properties"), we have reviewed the above referenced survey report, and find it to be sufficient. We note that this office did not receive the required Florida Master Site File site forms for the one previously unrecorded, prehistoric archaeological site, 8BR582, that was encountered and evaluated; update forms for the several previously known and reevaluated sites; or a completed Survey Log Sheet (copy enclosed).

Site 8BR582 was the only new site encountered and evaluated. This office has reviewed the survey data submitted for this site and concurs with the archaeologist's determination that the site is not eligible for listing in the National Register of Historic Places. We have also reviewed the KSC predictive model and management recommendations and concur with the archaeologist's suggestions.

If you have any questions concerning our comments, please do not hesitate to contact us. Your interest in protecting Florida's archaeological and historic resources is appreciated.

Sincerely,

Suzanne P. Walker
for George W. Percy, Director
Division of Historical Resources
and
State Historic Preservation Officer

GWP/lak
Enclosure

RELEASED - Printed documents may be obsolete; validate prior to use.

FLORIDA DEPARTMENT OF STATE
Jim Smith
Secretary of State

DIVISION OF HISTORICAL RESOURCES
R.A. Gray Building
500 South Bronough
Tallahassee, Florida 32399-0250
Director's Office (904) 488-1480
Telecopier Number (FAX) (904) 488-3353

December 10, 1991

Ms. Joan Deming, Vice President
Archaeological Consultants Incorporated
P.O. Box 5103
Sarasota, Florida 34277-5103

In Reply Refer To:
Denise M. Breit
Historic Sites Specialist
(904) 487-2333
Project File No. 913192

RE: Cultural Resource Assessment Review Request
Archaeological Survey to Establish Zones of Archaeological Potential (ZAPs) in the Launch Complex Area (Option 1) of the Kennedy Space Center. By Joan Deming, November 1991.

Dear Ms. Deming:

We have reviewed the results of the field survey of the above referenced project, and find them to be complete and sufficient. We note that 8 previously unidentified archaeological sites, two of which are potentially eligible for listing in the National Register (8BR913 and 8BR914), were located during the course of this survey. We also note that six sites were previously recorded for the Launch Complex Area. Of these, two could not be relocated (8BR61 and 8BR84), two had already been sufficiently studied so they were not reevaluated (8BR170 and 8BR773), and two were reevaluated (8BR79 and 8BR774). Of these latter two, 8BR774 was concluded to be potentially eligible for listing in the National Register. This office concurs with these recommendations.

The several blocks of land referred to on page 6 which were surrounded by deep and wide ditches or interior wetlands should be subjected to Phase I testing prior to development since they are described as being desirable for survey. We note that this course of action is addressed in the Site Management section of the report.

Finally, we have also reviewed the locations and descriptions of those areas designated as High and Moderate Zones of Archaeological Potential as well as the site management recommendations for the Launch Complex Area and concur with your suggestions.

RELEASED - Printed documents may be obsolete; validate prior to use.

If you have any questions concerning our comments, please do not hesitate to contact us. Your interest in protecting Florida's archaeological and historic resources is appreciated.

Sincerely,

Suzanne P. Walker

for George W. Percy, Director
Division of Historical Resources
and
State Historic Preservation Officer

GWP/Bdb

RELEASED - Printed documents may be obsolete; validate prior to use.

FLORIDA DEPARTMENT OF STATE
Jim Smith
Secretary of State
DIVISION OF HISTORICAL RESOURCES
R.A. Gray Building
500 South Bronough
Tallahassee, Florida 32399-0250
Director's Office (904) 488-1480
Telecopier Number (FAX) (904) 488-3353

February 6, 1992

Ms. Joan Deming, Vice President
Archaeological Consultants Incorporated
P.O. Box 5103
Sarasota, Florida 34277-5103

In Reply Refer To:
Denise M. Breit
Historic Sites
Specialist
(904) 487-2333
Project File No. 920151

RE: Cultural Resource Assessment Review Request
Archaeological Survey to Establish Zones of Archaeological Potential (ZAPs) in the Shuttle Landing and KSC South Areas (Option 2) of the Kennedy Space Center. By Joan Deming, January 1992.

Dear Ms. Deming:

In accordance with the procedures contained in 36 C.F.R., Part 800 ("Protection of Historic Properties"), we have reviewed the results of the field survey of the above referenced project, and find them to be complete and sufficient. We note that one previously unidentified archaeological site, 8BR1606, was located during the course of the survey. We also note that several previously recorded archaeological sites (8BR157, 8BR169/183, 8BR541, 8BR542, 8BR543) were relocated and evaluated. None of the above was determined to be a significant cultural resource. This office concurs with these conclusions.

The areas referred to on page 6 and page 10 which were inaccessible by vehicle or by foot should, nevertheless, be subjected to Phase I testing prior to development since they are described as being desirable for survey. This is especially true for those areas along the Indian River and the interior creeks and streams. We note that this course of action is addressed in the Site Management section of the report.

Finally, we have also reviewed the locations and descriptions of those areas designated as High and Moderate Zones of Archaeological Potential as well as the site management recommendations for the Shuttle Landing and KSC South Areas and concur with your suggestions.

RELEASED - Printed documents may be obsolete; validate prior to use.

If you have any questions concerning our comments, please do not hesitate to contact us. Your interest in protecting Florida's archaeological and historic resources is appreciated.

Sincerely,

Suzanne P. Walker
for George W. Percy, Director
Division of Historical Resources
and
State Historic Preservation Officer

GWP/Bdb

RELEASED - Printed documents may be obsolete; validate prior to use.

FLORIDA DEPARTMENT OF STATE
Jim Smith
Secretary of State

DIVISION OF HISTORICAL RESOURCES
R.A. Gray Building
500 South Bronough
Tallahassee, Florida 32399-0250
Director's Office (904) 488-1480
Telecopier Number (FAX) (904) 488-3353

January 12, 1993

Ms. Joan Deming, Vice President
Archaeological Consultants Incorporated
P.O. Box 5103
Sarasota, Florida 34277-5103

In Reply Refer To:
Denise M. Breit
Historic Sites
Specialist
(904) 487-2333
Project File No. 923635

RE: Cultural Resource Assessment Review Request
Archaeological Survey to Establish Zones of Archaeological Potential (ZAPs) in the KSC North Area (Option 3) of the Kennedy Space Center. By Joan Deming, December 1992.

Dear Ms. Deming:

We have reviewed the results of the field survey of the above referenced project, and find them to be complete and sufficient. We note that 18 previously unidentified archaeological sites (8BR1617-8BR1623, 8BR1625, 8BR1627-8BR1630, 8BR1632, 8BR1633, and 8VO4371-8VO4374) and three historic cemeteries (8BR1624, 8BR1626, and 8BR1631) were located during the course of the survey. In addition, many previously recorded sites were relocated and assessed. Based on the data recovered at each of the sites assessed, it was determined that the following are potentially eligible for listing in the National Register: 8BR1619, 8BR1620, 8BR1622, 8BR1630, 8BR1632, 8BR1633, 8BR77A, 8BR77B, 8BR78B, 8BR78D, 8BR141, 8BR142, 8BR147, 8BR148, 8BR149, 8BR151, 8BR155, 8BR175, 8BR188, 8BR205, 8VO130, 8VO131, 8VO148, 8VO151, 8VO160, and 8VO213. We concur with these results and recommendations. These sites should be avoided during development or construction related activities. If this is not feasible, they should be subjected to further testing in order to better assess site significance. The results of this further research would then need to be forwarded to this office in order to complete the project review.

We note that several areas which were desirable for survey were not tested during this study. Therefore, it is the recommendation of this office that these areas referred to on page 6 of the report (i.e., acreage characterized by dense and near impenetrable vegetation, areas whose access was cut off by deep and wide ditches) should be tested prior to any ground disturbing activities. Areas within the Canaveral National

RELEASED - Printed documents may be obsolete; validate prior to use.

Seashore that have a moderate to high probability for the occurrence of cultural resources should be tested as well. The results of these investigations would then need to be forwarded to this office in order to complete the project review.

We have also reviewed the locations and descriptions of those areas designated as High and Moderate Zones of Archaeological Potential as well as the site management recommendations for the KSC North Area (Option 3) and concur with your suggestions.

Finally, we concur with your recommendations that National Register nominations be prepared for the following properties:

8BR175 - Fort Ann
8BR78B and D - Douglas Dummett Homestead and Orange Grove
8VO160 - the Sugar Mill Ruins

If you have any questions concerning our comments, please do not hesitate to contact us. Your interest in protecting Florida's archaeological and historic resources is appreciated.

Sincerely,

for Laura A. Kammerer

George W. Percy, Director
Division of Historical Resources
and
State Historic Preservation Officer

GWP/Bdb

RELEASED - Printed documents may be obsolete; validate prior to use.

EXHIBIT 3-2
NONREIMBURSABLE SPACE ACT AGREEMENT REGARDING THE CLIFTON SCHOOLHOUSE (2006)

RELEASED - Printed documents may be obsolete; validate prior to use.

NONREIMBURSABLE SPACE ACT AGREEMENT BETWEEN NATIONAL AERONAUTICS AND SPACE ADMINISTRATION, JOHN F. KENNEDY SPACE CENTER AND BOARD OF COUNTY COMMISSIONERS BREVARD COUNTY, FLORIDA A POLITICAL SUBDIVISION OF THE STATE OF FLORIDA FOR CLIFTON SCHOOLHOUSE

I. AUTHORITY

This Agreement is entered into by the National Aeronautics and Space Administration, John F. Kennedy Space Center (hereinafter "NASA-KSC"), located at Kennedy Space Center, Florida 32899, and the Board of County Commissioners, Brevard County, Florida, A Political Subdivision of the State of Florida (hereinafter "County") located at 2725 Judge Fran Jamieson Way, B203, Viera, Florida 32940. This agreement is entered into pursuant to Sections 203(c)(5) and (6) of the Space Act of 1958, 42 U.S.C. Section 2473(c), as implemented by NASA Policy Directive 1050.1.

II. PURPOSE OF AGREEMENT AND AGENCY COMMITMENT

The Clifton Colored School – The Clifton Colored School was built in 1890-91 by Butler Campbell and Andrew Jackson for their nine children, who had been attending school at the home of their teacher, a black man by the name of Mr. Mahaffey. The schoolhouse was 12 feet by 16 feet, built of heart pine lumber, and sat on hand-cut coquina cornerstones. The front entrance faced west, and a set of two glass-paned windows were on the north and south sides. The interior walls and ceiling were covered with unpainted bead board. Mr. Mahaffey was praised for the high quality of education his students received. Studies included reading, math, physiology, English, and Latin. By 1910, most of the children were of the age to be out of school or attending school elsewhere, seeking a higher education. When NASA purchased the lands on north Merritt Island in the 1960s for use as part of the American space program, the families relocated to other areas. Most of the structures were demolished, but the schoolhouse was not removed.

The North Brevard Heritage Foundation, Inc., has been actively involved in promoting public awareness of the existence of this historically significant structure, which is located in a remote, wooded area on north Merritt Island owned by NASA within the boundary of Canaveral National Seashore (hereinafter CANA). Members of the Foundation and CANA discovered it after a field trip to a nearby site in August 2003. A closer inspection took place in January 2004, and the structure was documented with photographs and validated with maps and county records. Archeological Structure and Archeological Site Forms were completed by the Foundation and CANA staff, in accordance with the request of the State Historic Preservation Office (SHPO). Since then, members of the Foundation have presented extensive historical documentation supporting the necessity of preservation to NASA, Brevard County Board of County

RELEASED - Printed documents may be obsolete; validate prior to use.

Commissioners, Brevard County Historical Commission, the National Park Service, descendents of the Campbell family who built the school, local historical organizations, and the public.

NASA-KSC is a Federal agency, thus the Agency is responsible for managing historic properties on its lands as required under the Historic Preservation Act. This responsibility has been delegated to the National Park Service (at CANA) through Interagency Agreement within the area being considered. Therefore, upon the rediscovery of this property, NASA and CANA actively sought to determine the ultimate status and preservation approach. Through actions with CANA, the status of the structure was assessed and coordinated with the SHPO. Based on the current deteriorated condition of the structure, it was determined that it is no longer eligible for listing on the National Register of Historic Places. However, NASA-KSC recognizes that there is still historic value in the remains of the structure. The SHPO has stated that the building's remains can be removed from its current location. Therefore, NASA-KSC proposes to enter into a partnership with the County by allowing the County to remove the remains of the structure and reconstruct the schoolhouse at another location in Brevard County.

The County's plan is to use salvaged materials, recycled lumber, and new materials, to restore the structure as it appears in a vintage 1890s photo. New materials will be solicited from local businesses, and recycled materials are available from structures already demolished. Descendents of the Campbell family and Foundation members have volunteered to provide carpenter and in-kind services to accomplish this task. When completed, the restored Clifton Colored School will become part of the Heritage Park Complex at the Chain of Lakes Project. It will serve as an African-American living school museum, teaching history about the African-American education system and teachers of Brevard County, and the important role education played during the early twentieth century. It will also provide an insight into the life of the Campbell family, who homesteaded north Merritt Island in 1872 and owned citrus groves of their own. The County proposes to complete the inside with period school desks, a blackboard, chalkboards and chalk, rulers, and reproduction issues of McGuffey Readers. Funding will be provided through donations, grants, in-kind services, fundraising, and sponsorships.

When the Clifton Schoolhouse is restored, Brevard County Parks and Recreation Department will be responsible for operating and maintaining it as part of the Heritage Park Museum Complex at the Chain of Lakes Project. The Foundation will have an active role in providing docents for special events and developing storytelling and educational programs. In addition, the County will, through the Brevard Historical Commission, provide NASA and CANA with a roadside marker to be erected opposite the original site of the schoolhouse. CANA will erect the marker.

III. RESPONSIBILITIES

A. The County will use reasonable efforts to perform the following tasks. and other such tasks that may be required to meet the purpose of this agreement:

1. Provide mainly hand tools and a trailer or truck to haul the pieces to the reconstruction location. During the deconstruction of the building, various sizes of structural wood will be employed to secure and to brace the existing members and provide a safe environment to the personnel performing the work. Ropes and chain fall will be used to secure and to lower sections of the building for disassembly.

RELEASED - Printed documents may be obsolete; validate prior to use.

2. The work will be performed under the supervision of Michael F. Cunningham, a state registered general contractor (RG0026057).

B. The County hereby certifies that the services and/or facilities being provided under this agreement are not reasonably available from any domestic, nongovernmental entity.

C. NASA-KSC will use reasonable efforts to perform the following tasks, and other such tasks as may be necessary to meet the purpose of this agreement:

1. Provide security clearances as required for all workers associated with the project.
2. Provide coordination with CANA regarding placement of the roadside marker.
3. Provide photo documentation of the removal activities.

IV. FINANCIAL OBLIGATIONS

There will be no transfer of funds or other financial obligations between NASA-KSC and The County in connection with this agreement. Each party will fund its own participation under this agreement.

V. SCHEDULING AND PRIORITY OF USE

A preliminary schedule for the removal of the Clifton Schoolhouse project is estimated as follows:

Clifton Schoolhouse Relocation	Approximately early to mid-March.

The above schedule is estimated based upon the parties' current understanding of the project. In the event NASA's projected usage changes, The County shall be given reasonable notice of that change so that the schedule may be adjusted accordingly. The parties agree that NASA usage of the site shall have priority over the usage planned in this agreement, should a conflict arise, and NASA in its sole discretion shall determine whether to exercise that priority. Likewise, should a conflict arise as between two commercial users, NASA in its sole discretion shall determine the priority as between the two users The County will notify NASA-KSC of any schedule changes as soon as they are known.

VI. LIABILITY AND RISK OF LOSS

The County, along with the North Brevard Historical Foundation, agrees to assume liability for its own risks to property and personnel associated with activities undertaken in this agreement.

VII. KEY PERSONNEL

The following personnel are designated as the key officials for their respective party. These key officials are the principal points of contact between the parties in the performance of this agreement:

RELEASED - Printed documents may be obsolete; validate prior to use.

NASA-KSC:
Mario Busacca
KSC Historic Preservation Officer
Mail Code: TA-C3
Kennedy Space Center, FL 32899

Telephone: 321-867-8456
Fax: 321-867-8040
E-mail: Mario.Busacca-1@nasa.gov

The County:
Cheryl K. Page
Assistant Parks and Recreation Department Director
2725 Judge Fran Jamieson Way, B203
Viera, FL 32940

Telephone: 321-633-2046
Fax: 321-633-2198
E-mail : cpage@brevardparks.com

VIII. TERM OF AGREEMENT AND RIGHT TO TERMINATION

This agreement sets forth the entire and complete agreement between the parties. This agreement becomes effective on the date of the last signature of the parties. Either party, upon a 30-day written notice to the other party, may terminate this agreement, without liability, at any time and for any reason it deems substantial. In the event of such termination, each party shall return to the other any data it furnished to assist the other in performance of this agreement, but each party may retain any data generated by its partial performance under the agreement, unless any other section of this agreement provides otherwise. This agreement shall expire upon completion of all obligations of both parties hereto, or not to exceed one year from the date of the last signature of the parties, whichever comes first.

IX. MODIFICATIONS TO THE AGREEMENT

Any modification to this agreement shall be executed in writing and signed by an authorized representative of each party. Any modification which creates an additional commitment of NASA resources must be signed by the original NASA signatory authority or successor, or a higher-level NASA official possessing original or delegated authority to make such a commitment.

X. NEWS RELEASES AND PUBLICATIONS

The parties agree to coordinate in advance any news releases and/or widely distributed publications that result from activities performed pursuant to this agreement. This coordination shall entail notifying the respective points of contact of the proposed news release or publication in sufficient time to allow the other party an opportunity to review and comment as deemed appropriate. Neither party shall issue a news release or publication prior to the other's consent.

XI. USE OF THE NASA NAME, INITIALS, AND DEVICES

The County agrees to submit to NASA for its approval all promotional and advertising material that uses the NASA name, initials, insignia, seal, or logotype prior to publication. Approval by NASA shall be based on applicable law (e.g., 42 U.S.C. §§2459(b), 2472(a), and 2473(c)(1); and 14 C.F.R. §1221.100 et seq.) and policy governing the use of the words "National Aeronautics and Space Administration" and the letters "N A S A" and the NASA insignia, seal, and logotype.

RELEASED - Printed documents may be obsolete; validate prior to use.

XII. INDEPENDENCE OF CONTRACTS

The parties agree that this agreement is independent of any other contract between the United States Government and The County.

XIII. ASSIGNMENT OF RIGHTS

Neither this agreement nor any interest arising under it will be assigned by The County or NASA without the express written consent of the officials executing the agreement.

XIV. APPLICABLE LAWS, RULES, REGULATIONS AND POLICIES

A. United States Federal law governs this agreement for all purposes, including, but not limited to, determining the validity of the agreement, the meaning of its provisions, and the rights, obligations and remedies of the parties.

B. While engaged in activities on NASA-KSC property pursuant to this agreement, The County agrees to comply with all NASA-KSC policies, rules, and regulations in effect at the time the activities are occurring. This includes, but is not limited to, all safety, health, security, and environmental requirements.

XV. NONEXCLUSIVITY

This agreement is not exclusive; accordingly, NASA may enter into similar agreements for the same or similar purpose with other United States private or public entities.

XVI. EXECUTION

This agreement is hereby executed in duplicate originals by the undersigned.

National Aeronautics
and Space Administration
John F. Kennedy Space Center

BY: _____
James W. Kennedy
Director

Date: MAR - 3

Board of County Commissioners
Brevard County, Florida
A Political Subdivision of the State of Florida

BY: _____
Helen Voltz
Chair

Date: 3/20/06

RELEASED - Printed documents may be obsolete; validate prior to use.

EXHIBIT 3-3
SHPO CONCURRENCE LETTER REGARDING HISTORIC FACILITIES SURVEY AND REASSESSMENT OF THE EXISTING NRHP LC-39 SITE (8BR172) (1998)

RELEASED - Printed documents may be obsolete; validate prior to use.

FLORIDA DEPARTMENT OF STATE
Office of the Secretary
Office of International Relations
Division of Administrative Services
Division of Corporations
Di of Cultural Affairs

KSC-PLN-1733 Rev A-1

MEMBER OF THE FLORIDA CABINET
Division of Library & Information Services
Division of Historical Resources
Ringling Museum of Art
Division of Licensing
Division of Elections

FLORIDA DEPARTMENT OF STATE
Sandra B. Mortham
Secretary of State
DIVISION OF HISTORICAL RESOURCES

August 27, 1998

Ms. Joan Deming
Archaeological Consultants, Inc.
P.O Box 5103
Sarasota, Florida 32606

In Reply Refer To:
Frank J. Keel
Historic Preservation Planner
Project File No. 985701

RE: *Survey and Evaluation of the Historic Facilities Within the Industrial Launch Complex 39 (LC-39), Vehicle Assembly Building (VAB), and Shuttle Landing Facilities (SLF) Areas of the John F. Kennedy Space Center (KSC), Brevard County, Florida, Including A Reassessment of the Existing National Register of Historic Places Launch Complex 39 Site (8BR172).* By Archaeological Consultants, Inc. April 1997, Revised August 1998.

Dear Ms. Deming:

Thank you for providing this office with a copy of the referenced document. According to Barbara Mattick, Survey and Registration Section, the cover and revisions of old nominations appear to be acceptable and the newly nominated properties have been determined to be potentially eligible for listing in the *National Register of Historic Places*. The cover and nominations appear to be ready to be forwarded to the National Register Division in Washington D.C. for final review. The individual site forms will be sent to the Florida Master Site File for inclusion in state's inventory of historic properties.

If you have any questions, please do not hesitate to contact us.

Sincerely,

for Laura A. Kammerer

George W. Percy, Director
Division of Historical Resources
and
State Historic Preservation Officer

GWP/Kfk

RELEASED - Printed documents may be obsolete; validate prior to use.

EXHIBIT 3-4
EVALUATING HISTORIC RESOURCES ASSOCIATED WITH THE SPACE SHUTTLE PROGRAM: CRITERIA OF ELIGIBILITY FOR LISTING IN THE NATIONAL REGISTER OF HISTORIC PLACES (NRHP)

RELEASED - Printed documents may be obsolete; validate prior to use.

EVALUATING HISTORIC RESOURCES ASSOCIATED WITH THE SPACE SHUTTLE PROGRAM: CRITERIA OF ELIGIBILITY FOR LISTING IN THE NATIONAL REGISTER OF HISTORIC PLACES (NRHP)

Purpose

A "new era for the U.S. Space Program" began on February 13, 1969, when President Richard Nixon established the Space Task Group (STG). The purpose of this committee was to conduct a study to recommend a future course for the U.S. Space Program. Three years later, on January 5, 1972, the Space Shuttle Program was initiated in a speech delivered by President Nixon. During this speech, Nixon outlined the end of the Apollo era and the future of a reusable space flight vehicle, which would allow the U.S. to construct Space Station by carrying cargo to and from outer space. Subsequently, the end of the Space Shuttle Program was announced in a speech delivered by President George W. Bush in January 2004. Although plans for space exploration would advance, the technology of the Space Shuttle and its associated facilities would change or end by 2010. The significance of the Space Shuttle was noted by the National Park Service (NPS) in the 1998 National Register Bulletin, *Guidelines for Evaluating and Documenting Historic Aviation Properties.* The following excerpt is from that bulletin.

> The Space Shuttle was the U.S. space program's next generation. Key aspects of the Shuttle's design and performance were based on a rocket-powered space plane, the X-15, the world's first transatmospheric vehicle. The Space Shuttle provided a new method of space flight, taking off like a rocket and landing like an airplane. The Space Shuttle Columbia, the first reusable manned spaceship, initiated the Space Shuttle flight program in April 1981, and a new era for the U.S. Space Program (Milbrooke 1998:12).

The historic values of this program, like the Apollo-era program which preceded it, are embodied in the facilities, that is; the buildings, structures and objects within the NASA centers. The purpose of this study is to identify the NASA-controlled facilities of local, state, and/or national significance in the historic context of the U.S. Space Shuttle Program, circa 1969 to 2010. Such facilities may include, but are not necessarily limited to, those used for research, development, design, testing, fabrication, and operations. NASA will also look at certain types resources that are not facilities and are considered "personal property" under federal regulations. These resources are typically large and while they may be mobile, are also usually associated with a geographical location, An example of this type of resource are the Mobile Launch Platforms at the Kennedy Space Center.

The evaluation of facilities within the context of the Space Shuttle Program will, in part, proceed from earlier studies of the Apollo-era resources at various NASA centers. The first step in evaluating these facilities at the NASA Centers was to establish and describe the applicable historic contexts and subcontexts. The key reference relating to the Apollo program used in this assessment was the *Man In Space Theme Study*, completed in 1984 by the National Park Service. According to the study, the purpose was to evaluate:

RELEASED - Printed documents may be obsolete; validate prior to use.

All resources which relate to the theme of Man in Space and to recommend certain of those resources for designation as National Historic Landmarks.

The Man in Space Theme Study considered resources relating to the following general subthemes:

A. Technical Foundations before 1958
B. The Effort to Land a Man on the Moon
C. The Exploration of the Planets and Solar System
D. The Role of Scientific and Communications Satellites

The Theme Study considered the Space Program in an integrated fashion. In any given space mission thousands of scientists, technicians, and other support personnel were necessary to insure success. These support personnel performed vital work in a variety of ways using support facilities in many parts of the country. None of these personnel in all likelihood comprehended all aspects of each space mission, yet all were vital to the success of the program. Since individual missions lasted over many years and involved a wide variety of resources and people only a few managers at the National Aeronautics and Space Administration (NASA) were able to see all of the facets of the space program. It was this coordination, cooperation, and collaboration that enabled NASA to successfully manage the American Space Program. The theme study follows this same approach and attempts to identify, inasmuch as is possible, the surviving resources of those that were necessary to accomplish the goals of landing a man on the moon and exploring the earth, planets and solar system (Butowsky 1984).

The National Register of Historic Places (NRHP) Criteria for Evaluation and Criteria Considerations

The significance of a cultural resource is evaluated in terms of the eligibility criteria for listing in the NRHP. The National Register Criteria for Evaluation, as described in 36 CFR Part 60.4, are as follows:

The quality of significance in American history, architecture, archeology, engineering and culture is present in districts, sites, buildings, structures and objects that possess integrity of location, design, setting, materials, workmanship, feeling and association and:

A. That are associated with events that have made a significant contribution to the broad patterns of history; or

B. That are associated with the lives of persons significant in our past; or

C. That embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or

D. That have yielded, or may be likely to yield information important in prehistory or history.

RELEASED - Printed documents may be obsolete; validate prior to use.

The significance of historic buildings, structures, objects and districts is usually evaluated under Criterion A (association with historic events); Criterion B (association with important persons); or Criterion C (distinctive design or distinguishing characteristics as a whole). Often, more than one criterion will apply to historic resources.

Some types of cultural resources are not typically considered eligible for the NRHP. These resources are religious properties (A), moved properties (B), birthplaces and graves (C), cemeteries (D), reconstructed properties (E), commemorative properties (F), and properties that have achieved significance within the past fifty years (G). As a result, a resource may meet one or more NRHP criteria and still not be eligible unless special requirements are met. These requirements are called Criteria Considerations and are labeled A-G. Of relevance to the Space Shuttle Program study are Criteria Considerations B and G, as follows:

Criteria Consideration B: Moved Properties - *A property removed from its original or historically significant location can be eligible if it is significant primarily for architectural value or it is the surviving property most importantly associated with a historic person or event.*

Criteria Consideration G: Properties that have Achieved Significance within the Past 50 Years – *A property achieving significance within the last fifty years is eligible if it is of exceptional importance.*

The Space Shuttle Program: Proposed NRHP Criteria for Evaluation and Criteria Considerations

In order to qualify for listing in the NRHP under this study, resources must meet all of the following general registration requirements:

- Is real or personal property owned or controlled by NASA ;
- Was constructed, modified or used for the Space Shuttle Program between the years 1969 and 2010 (or the actual end of the Space Shuttle Program);
- Is classified as a structure, building, site, object, or district;
- Is eligible under one or more of the four NRHP Criteria. All properties considered eligible for listing under;

  Criterion A - Events
  - Must be of significance in reflecting the important events associated with the Space Shuttle Program during the period of significance (1969-2010); or,
  - Must be distinguished as a place where significant program-level events occurred regarding the origins, operation and/or termination of the Space Shuttle Program; or

  Criterion B - Significant Persons

RELEASED - Printed documents may be obsolete; validate prior to use.

- Must be associated with a person whose individual significance to the goals, missions, development and design of the Space Shuttle Program can be identified and documented; or
- Must be distinguished as a place where persons of significance to the Space Shuttle Program worked or trained; or
- Best represents the important achievements or the cumulative importance of prominent persons; or
- Has consequential association with a person who gained prominence relative to the Space Shuttle Program during the period of significance.

Criterion C – Design/Construction

- Was uniquely designed and constructed or modified to support the pre-launch testing, processing, launch and retrieval of the Space Shuttle and its associated payloads; or
- Reflects the historical mission of the Space Shuttle in terms of its unique design features without which the program would not have operated; or
- Reflects the distinctive progression of engineering and adaptive reuse from the Apollo-era to the Space Shuttle-era

Criterion D – Information Value

- As this criterion is primarily used for archeological sites and this document is focused on historic properties, it is inappropriate to use this criterion as a discriminator, therefore, it will not be a valid criterion for surveys used as part of the Space Shuttle Transition activities.

- Meets appropriate Criteria Considerations - Certain kinds of property that are not usually considered eligible for listing in the NRHP, although they may meet the NRHP Criteria stated above, will require special considerations. Such properties which might fall into this category are those that have been moved (Criterion Consideration B) or properties that have achieved significance within the past fifty years (Criterion Consideration G)

  - *B: Moved Properties* – Some historic resources of significance in the context of the Space Shuttle Program may meet Criteria Consideration B since they were designed to be moved. Thus, it is not required that they, or their integral components, be at their original location in order to retain integrity. These resources are generally significant for their engineering or are significant for their association with events or persons integral to the Space Shuttle Program. However, objects removed from their original setting and that are now located within a museum are typically excluded from NRHP-listing as the change in setting and location diminishes the resources' historic integrity (NPS 1998:36).

  - *G: Properties that have Achieved Significance within the Past 50 Years* – The entire Space Shuttle Program is less than 50 years old. Therefore, Criterion G cannot be a discriminator for determining eligibility, as some properties utilized by the Space Shuttle Program may be over 50 years old. Properties that are determined to possess exceptional significance in the context of the Space Shuttle Program that are less than 50-years old must meet Criteria Consideration G.

RELEASED - Printed documents may be obsolete; validate prior to use.

- Retains enough integrity to convey its historical significance. The NRHP recognizes seven aspects or qualities that, in various combinations, define integrity: location, setting, materials, design, workmanship, feeling, and association. However, many original NASA Apollo-era facilities, for example, have undergone major modification and are in active use supporting the Space Shuttle Program. As a general rule, in the case of highly technical and scientific facilities, "there should be continuity in function, and thus in integrity of design and materials, and there may always be integrity of association" (ACHP 1991:33).

Criteria of Eligibility by Property Type

The following twelve property types, and the associated National Register eligibility criteria, may be used in the evaluation of all NASA owned and controlled facilities at all NASA centers. Use of these categories will help narrow the list of eligible properties to those that have true significance in the overall context of the Space Shuttle Program. Many of the facilities may have already been designated as eligible under the Apollo program. The use of these criteria on those properties in no way negates their previous designations. Rather it adds to the historical context of those properties.

1. Resources Associated with Transportation: A variety of transportation resources were constructed and/or modified to support mission and launch operations in support of the Space Shuttle Program. These resources include roadways, bridges, Crawlerways, runways and landing facilities, helipads, and waterways. Special-use vehicles also are part of the transportation network. These include Payload Transporters, Crawler Transporters, Multi-use Mission Support Equipment (MMSE) Transporters, 747 Carrier Aircraft, the astrovan, External Tank barge and recovery vessels. In order to qualify for NRHP listing, transportation resources must meet one or more of the following criteria:

- Have been used for the transportation of unique objects, structures, or significant persons associated with Space Shuttle missions;
- Have been an essential component to the Space Shuttle missions, such that the program could not function without it;
- Clearly embody the distinctive characteristics of a type or method of construction specifically designed for the transportation of the Space Shuttle or its payloads;
- Have a direct historical association with the Space Shuttle (including the Orbiter, external tank and solid rocket boosters), or a significant person associated with the Space Shuttle Program;
- Must be examples of one of the identified subtypes: road-related resources, water-related resources, rail-related resources, and air-related resources.

2. Vehicle Processing Facilities: Vehicle processing facilities include those resources which are vital to the preparation of the launch vehicle for its mission. NASA vehicle processing facilities administer such operations as assembly, testing, checkout, refurbishment, and protective storage for launch vehicles and spacecrafts. Those processing facilities which are eligible for the NRHP were essential in support of the Space Shuttle Program and include but are not limited to the "Tile Shop", the Vehicle Assembly Building, the Orbiter Processing Facility, and Hangar AF. To be considered significant, the

RELEASED - Printed documents may be obsolete; validate prior to use.

resources must have been essential to the successful completion of Space Shuttle missions. Vehicle processing facilities were specifically designed for processing the launch vehicle and, therefore, played a major role in nationally significant events related to space exploration. In order to qualify for listing, resources must:

- Have been an essential component to the processing of the Space Shuttle;
- Clearly embody the distinctive characteristics of a type or method of construction specifically designed or modified for the processing of the Space Shuttle for launch;
- Have a direct historical association with the Space Shuttle, or a significant person associated with the Space Shuttle Program.

3. Launch Operation Facilities: Launch Operation Facilities support all activities which occur after the launch vehicle has been processed up to the point of launch. These facilities provide a base and support structure for the transport and launching of the vehicle, service the launch vehicle at the launch pad, control pre-launch and launch operations, and launch the vehicle. These facilities include but are not limited to launch pads, Launch Control Center (LCC) Mobile Launch Platforms (MLPs), the Rotating Service Structure (RSS), and the Fixed Service Structure (FSS). Such facilities function as the primary resources integral to the launch of the Space Shuttle. In order to qualify for listing, resources must:

- Possess engineering importance and have facilitated nationally significant events associated with space travel;
- have been integral in pre-launch and launch preparation or the launching of the Space Shuttle;
- Clearly embody the distinctive characteristics of a type or method of construction specifically designed for the Space Shuttle;
- Have a direct historical association with the Space Shuttle, or a significant person associated with the Space Shuttle Program;

4. Mission Control Facilities: Support the design, development, planning, training and flight control operations for Space Shuttle flights. These facilities provide the infrastructure that allow the planning, training and flight operations processes necessary to support the Space Shuttle from the inception of requirements through the flight execution process. In order to qualify for listing, resources must have:

- Developed integrated flight crew and flight control plans, procedures, and training;
- Established simulators and flight control ground instrumentation;
- Configured Orbiter flight software;
- Contributed to the development and integration of spacecraft and payload support system;.
- Provided onboard portable computer hardware and software for the Space Shuttle.

5. News Broadcast Facilities: Press facilities provide a primary site for news media activities at NASA-owned facilities. These broadcasting facilities were essential for relating to the American public news of the Space Shuttle Program to the nation and the world. In order to qualify for listing, resources must:

RELEASED - Printed documents may be obsolete; validate prior to use.

- Have been an integral facility in the dissemination of information about the Space Shuttle missions to the public;

- Clearly embody the distinctive characteristics of a type or method of construction specifically designed to broadcast information;
- Be associated with a significant person associated with the broadcast of Space Shuttle events;

6. Communication Facilities: Communication facilities in support of the Space Shuttle Program provide a vital site for instrumentation to receive, monitor, process, display and/ or record information from the space vehicle during test, launch, and/or flight. Significant communication facilities were designed specifically to house computers and computer-related technology vital to the Space Shuttle mission. In order to qualify for listing, resources must:

- Have been integral to the mission of the Space Shuttle;
- Clearly embody the distinctive characteristics of a type or method of construction specifically designed for the Space Shuttle missions;
- Have a direct historical association with the Space Shuttle, or a significant person associated with the Space Shuttle Program.

7. Engineering and Administrative Facilities: Engineering and Administrative Facilities include those resources which are essential to the administrative, scientific, and engineering work of the Space Shuttle Program. Engineering and Administrative Facilities administer such operations as research and development, testing, fiscal matters, procurement, planning, central management, and facilities engineering and construction, as well as providing offices for associated contractors and laboratories for engineers and scientists. These facilities which qualify for listing under the Space Shuttle context must:

- Be places, such as test facilities, that are directly associated with activities of significance which were associated with the development, component testing, implementation and termination of the Space Shuttle Program or missions;
- Be places where persons who made lasting achievements to the Space Shuttle Program worked or convened;
- Should clearly embody the distinctive characteristics of a type or method of construction.

8. Space Flight Vehicle (or Space Shuttle): This property type includes resources that comprise and/or facilitate the space flight vehicle or Space Shuttle. These include, but are not limited to, the Orbiter, Solid Rocket Booster (SRB), and External Tank (ET) as well as mockups of these components that were used for flight tests or other important development activities. In order to qualify for listing, resources must:

- Have been an integral component of the Space Shuttle Stack in its completed form, ready for space flight;
- Have been essential to the Space Shuttle missions and should clearly embody the distinctive aspect of reusability which reflects the goals of the Space Shuttle Program;
- Have been developed and used as test components used in preparation or evaluation for flight or flight tests;
- Have a direct historical association with the Space Shuttle, or a significant person associated with the Space Shuttle Program.

9. Manufacturing and Assembly Facilities: This property type includes facilities where major flight components were manufactured or assembled. These would include the manufacturing plants where the major components of the Space Shuttle vehicle were fabricated and assembled. In order to qualify, these facilities must:

- Have been an essential component to the manufacturing or assembling of the Space Shuttle;
- Have been constructed or modified to house this manufacturing or assembly facility exclusively;
- Embody a design that is unique to the Space Shuttle requirements;
- Have a direct historical association with the Space Shuttle, or a significant person associated with the Space Shuttle Program.

10. Resources Associated with the Training of Astronauts: This property type includes resources constructed or modified for the purpose of astronaut training and preparation for Space Shuttle missions. These facilities may include but are not limited to: processing facilities, neutral buoyancy tank, flight simulators and training aircraft. In order to qualify for listing, resources must:

- Have been designed and constructed, or modified, for the unique purpose of astronaut training and be directly associated with preparing astronauts for the completion of a Space Shuttle mission;
- Clearly embody the distinctive characteristics of a type or method of construction specifically designed for aeronautical training;
- Have a direct historical association with the Space Shuttle, or a significant person associated with the Space Shuttle Program.

11. Resources Associated with Space Flight Recovery: This property type includes resources that facilitate the recovery of the Space Flight Vehicle or Space Shuttle and its significant components after its return to Earth. These include, but are not limited to, runways, the Mate/De-mate Facility(s) and equipment, the Solid Rocket Booster Retrieval Ships (*Liberty* and *Freedom*), the Transporter and Wash Building, and the flume that brings the SRB to the building from the ships. These resources are essential to the recovery and subsequent reuse of the Space Shuttle and are therefore a significant resource to the program as a whole. In order to qualify for listing, resources must:

- Have been integral to the recovery of the Space Shuttle and/or its significant components;
- Clearly embody the distinctive characteristics of a type or method of construction specifically designed for the recovery of the Space Shuttle;
- Have a direct historical association with the Space Shuttle, or a significant person associated with the Space Shuttle Program.

12. Resources Associated with Processing Payloads: This property type is limited to facilities where fully assembled payloads are readied for insertion in the Space Shuttle Orbiter. In order to qualify for listing, resources must have been used in the processing of payloads for the Space Shuttle. Eligibility is restricted to resources which:

- Represent outstanding achievements in technological, aeronautical or scientific research which would otherwise not have been attainable without the use of the Space Shuttle;

- Clearly embody the distinctive characteristics of a type or method of construction, and which reflect the distinctive aspect of reusability unique to the goals of the Space Shuttle Program;
- Have a direct historical association with the Space Shuttle, or a significant person associated with scientific and/or technological advancements of national significance made as part of the Space Shuttle Program.

References Cited

Advisory Council on Historic Preservation (ACHP)
1991 *Balancing Historic Preservation Needs with the Operation of Highly Technical or Scientific Facilities*. Washington, D.C.

1995 *Consideration of Highly Technical and Scientific Facilities in the Section 106 Process*. Washington, D.C.

Butowsky, Dr. Harry A.
1984 *Man In Space National Historic Landmark Theme Study*. U.S. Department of the Interior, National Park Service, Washington, D.C. May.

Milbrooke, Anne
1998 National Register Bulletin, *Guidelines for Evaluating and Documenting Historic Aviation Properties.* U.S. Department of the Interior, National Park Service, Washington, D.C.

National Park Service (NPS)
1998 National Register Bulletin, How to Apply the National Register Criteria for Evaluation. U.S. Department of the Interior, National Park Service, Washington, D.C.

RELEASED - Printed documents may be obsolete; validate prior to use.

EXHIBIT 3-5
SHPO CONCURRENCE LETTERS
FOR HISTORIC FACILITIES SURVEYS
AND DETERMINATIONS OF ELIGIBILITY

RELEASED - Printed documents may be obsolete; validate prior to use.

FLORIDA DEPARTMENT OF STATE
Kurt s. Browning
Secretary of State
DIVISION OF HISTORICAL RESOURCES

May 27, 2008

Ms. Barbara Naylor
Mail Code TA-C4
John F. Kennedy Space Center, NASA
Kennedy Space Center, FL 32899

Re: SHPO/DHR Project File No: 2007-9035
Received: December 6, 2007
Survey and Evaluation of NASA-owned Historic Facilities and Properties In the Context of the U.S. Space Shuttle Program – John F. Kennedy Space Center – Brevard County, Florida
Archaeological Consultants, Inc.; October 2007

Dear Ms. Naylor:

Our office received and reviewed the above referenced survey report in accordance with Section 106 of the *National Historic Preservation Act of 1966* as amended in 1992; *36 C.F.R., Part 800: Protection of Historic Properties*; and Chapter 267, *Florida Statutes*, for assessment of possible adverse impact to cultural resources (any prehistoric or historic district, site, building, structure, or object) listed, or eligible for listing, in the *National Register of Historic Places (NRHP).*

In October 2007, Archaeological Consultants, Inc. completed an intensive survey of Space Shuttle Program (SSP) facilities and properties at Kennedy Space Center (KSC) on behalf of the National Aeronautics and Space Administration. One hundred and twelve (112) properties were identified and evaluated. Seventy-six (76) properties were determined to meet the criteria of eligibility for listing in the *NRHP*, or are currently listed in the *NRHP*; and 40 properties identified and evaluated did not meet the criteria for listing in the NRHP. Of the 76 NRHP eligible properties, 26 of them are individually eligible properties, and the remaining properties are contributing resources one of the six historic districts. Four new districts were identified, in addition to the two previously NRHP listed districts at KSC.

500 S. Bronough Street • Tallahassee, FL 32399-0250 • http://www.flheritage.com

☐ **Director's Office** (850) 245-6300 • FAX: 245-6436
☐ **Archaeological Research** (850) 245-6444 • FAX: 245-6452
☑ **Historic Preservation** (850) 245-6333 • FAX: 245-6437

RELEASED - Printed documents may be obsolete; validate prior to use.

Based on the very thorough documentation provided in this unique resource type survey effort, our office concurs with the evaluations completed by ACI and presented by NASA to this office as a completed inventory of SSP facilities and properties at KSC. We find the submitted report sufficient in all aspects of Chapter 1A-46, *Florida Administrative Code*.

If you have any questions concerning our comments, please contact Laura Kammerer, Deputy State Historic Preservation Officer for Review and Compliance, at 850-245-6333 or lkammerer@dos.state.fl.us. Thank you for your interest in protecting Florida's historic properties.

Sincerely,

Frederick P. Gaske

Frederick P. Gaske, Director, and
State Historic Preservation Officer

RELEASED - Printed documents may be obsolete; validate prior to use.

FLORIDA DEPARTMENT OF STATE
Dawn K. Roberts
Interim Secretary of State
DIVISION OF HISTORICAL RESOURCES

Ms. Barbara Naylor
National Aeronautics and Space Administration
Kennedy Space Center
Mail Code: TA-A4C
Kennedy Space Center, Florida 32899

December 7, 2010

RE: DHR Project File Number: 2010-5387
Historical Survey and Evaluation of the Space Station Processing Facility
Kennedy Space Center, Brevard County

Dear Ms. Naylor:

This office reviewed the referenced report in accordance with Section 106 of the *National Historic Preservation Act of 1966*, as amended, *36 CFR Part 800: Protection of Historic Properties* and the *National Environmental Policy Act of 1969*, as amended.

In April 2010, Archaeological Consultants, Inc. (ACI) conducted a historical survey and evaluation of the Space Station Processing Facility (8BR2671). ACI determined that the facility appeared to meet the criteria for listing in the *National Register* under Criteria A, C, and G. Based on the information provided, our office concurs with the determination of eligibility and finds the report complete and sufficient.

If you have any questions concerning our comments, please contact Scott Edwards, Historic Preservationist, by electronic mail *sedwards@dos.state.fl.us*, or at 850.245.6333.

Sincerely,

Laura A. Kammerer

Laura A. Kammerer
Deputy State Historic Preservation Officer
For Review and Compliance

500 S. Bronough Street • Tallahassee, FL 32399-0250 • http://www.flheritage.com

☐ **Director's Office** (850) 245.6300 • FAX: 245.6436
☐ **Archaeological Research** (850) 245.6444 • FAX: 245.6452
☑ **Historic Preservation** (850) 245.6333 • FAX: 245.6437

RELEASED - Printed documents may be obsolete; validate prior to use.

FLORIDA DEPARTMENT of STATE

RICK SCOTT
Governor

KEN DETZNER
Secretary of State

Ms. Barbara A. Naylor
Historic Preservation Officer
Kennedy Space Center
National Aeronautics and Space Administration
Kennedy Space Center, FL 32899

March 30, 2012

RE: DHR/SHPO Project File Number: 2012-1277 (2011-1980)
NASA Reference Number: TA-A4C
Historic Survey and Evaluation of Hypergol Module Processing South (M7-1212) and Boresight Control Building (M7-0867)
Kennedy Space Center, Brevard County

Dear Ms. Naylor:

This office reviewed the referenced projects in accordance with Section 106 of the *National Historic Preservation Act of 1966*, as amended and *36 CFR Part 800: Protection of Historic Properties*.

Based on the information provided, our office concurs that the *Hypergol Module Processing South Building (M7-1212)* appears to meet the criteria for listing in the *National Register* as a contributing resource to the *Hypergol Maintenance and Checkout Area Historic District* (8BR2015). We also concur that the *Boresight Control Building (M7-1212)* does not appears to meet the criteria for listing in the *National Register.*

We look forward to receiving Florida Master Site File Historical Structure forms for the Hypergol Module Processing South Building and the Boresight Control Building, along with an updated Hypergol Maintenance and Checkout Area Historic District (8BR2015) Resource Group form.

If you have any questions concerning our comments, please contact Scott Edwards, Historic Preservationist, by electronic mail *scott.edwards@dos.myflorida.com*, or at 850.245.6333 or 800.847.7278.

Sincerely,

Laura A. Kammerer

Laura A. Kammerer
Deputy State Historic Preservation Officer
For Review and Compliance

RELEASED - Printed documents may be obsolete; validate prior to use.

FLORIDA DEPARTMENT of STATE

RICK SCOTT
Governor

KEN DETZNER
Secretary of State

Ms. Barbara A. Naylor
Kennedy Space Center
National Aeronautics and Space Administration
Kennedy Space Center, FL 32899

July 30, 2012

RE: DHR Project File Number: 2012-2030-B
Final Report: Historic Evaluation and Survey of Facility #49635/Environmental Health/Health Physics (aka Bioastronautics Operation Support Unit/BOSU – 8BR2905)
Cape Canaveral Air Force Station, Brevard County

Dear Ms. Naylor:

Our office received and reviewed documentation in accordance with the 2009 *Programmatic Agreement (Programmatic Agreement Among the National Aeronautics and Space Administration, John F. Kennedy Space Center, Advisory Council on Historic Preservation, and the Florida State Historic Preservation Officer Regarding Management of Historic Properties at the Kennedy Space Center, Florida).*

We find the documentation to be complete and sufficient and fulfills Stipulation V of the referenced Programmatic Agreement. The documentation will be forwarded to the Florida Master Site File Office.

This office would like to compliment you and your office on the thoroughness of the documentation. If you have any questions concerning our comments, please contact Scott Edwards, Historic Preservationist, by electronic mail *scott.edwards@dos.myflorida.com*, or at 850.245.6333 or 800.847.7278.

Sincerely,

Laura A. Kammerer

Laura A. Kammerer
Deputy State Historic Preservation Officer
For Review and Compliance

RELEASED - Printed documents may be obsolete; validate prior to use.

FLORIDA DEPARTMENT of STATE

RICK SCOTT
Governor

KEN DETZNER
Secretary of State

Ms. Barbara A. Naylor
Historic Preservation Officer
Kennedy Space Center
National Aeronautics and Space Administration
Kennedy Space Center, FL 32899

January 4, 2013

RE: DHR Project File Number: 2012-4670-B
Revised Historic Survey and Evaluation and Technical Memorandum of the Jay Jay Railroad Draw Bridge (H2-1198) Locomotive Maintenance Facility (K6-1844) and Railroad System
John F. Kennedy Space Center, Brevard County

Dear Ms. Naylor:

Our office received and reviewed the revised referenced survey report in accordance with Section 106 of the *National Historic Preservation Act of 1966* (Public Law 89-665), as amended in 1992, and *36 C.F.R., Part 800: Protection of Historic Properties*, and Chapter 267, *Florida Statutes*, for assessment of possible adverse impact to cultural resources (any prehistoric or historic district, site, building, structure, or object) listed, or eligible for listing, in the *National Register of Historic Places* (NRHP).

Thank you for submitting the revised report dated November 2012 in response to our comments in our October 23, 2012 letter.

In January 2012, Archaeological Consultants, Inc. (ACI) conducted a historical survey and evaluation of the Jay Jay Railroad Draw Bridge, the railroad system, and the locomotives and railcars at the John F. Kennedy Space Center on behalf of the National Aeronautics and Space Administration (NASA).

ACI identified twenty-eight previously unrecorded historic resources (8BR2906 – 8BR2932 and 8BR3035) within the project area during the investigation. ACI determined that the *Jay Jay Railroad Draw Bridge* (8BR2906), *NLAX 170* (8BR2908), *and 171* (8BR3042), which are 70-Ton flatcars, *Locomotives 1* (8BR2923), *2* (8BR3042), *and 3* (8BR3044), and *NASA KSC Railroad Track* (8BR2931) appear to meet the criteria for listing in the NRHP as contributing resources to the *NASA KSC Railroad System Historic District* (8BR2932). ACI determined that remaining twenty-four historic resources do not appear to meet the criteria for listing in the NRHP.

Based on the information provided, our office concurs with these determinations and finds the submitted report complete and sufficient in accordance with Chapter 1A-46, *Florida Administrative Code (FAC).*

RELEASED - Printed documents may be obsolete; validate prior to use.

This office would like to compliment your office and Archaeological Consultants, Inc. on the thoroughness of the survey report. If you have any questions concerning our comments, please contact Scott Edwards, Historic Preservationist, by electronic mail *scott.edwards@dos.myflorida.com*, or at 850.245.6333 or 800.847.7278.

Sincerely,

Timothy A. Parsons, DSHPO for

Robert F. Bendus, Director
Division of Historical Resources
and State Historic Preservation Officer

RELEASED - Printed documents may be obsolete; validate prior to use.

FLORIDA DEPARTMENT of STATE

RICK SCOTT
Governor

KEN DETZNER
Secretary of State

Ms. Barbara Naylor, KSC Preservation Officer
Attn: TA-A4C
KSC/NASA
Kennedy Space Center, Florida 32899

March 3, 2014

RE: DHR Project File No.: 2014-0521, Received by DHR: February 6, 2014
Application No.: N/A
Project: *Architectural Survey and Evaluation of National Aeronautics and Space Administration (NASA)-owned Facilities on Cape Canaveral Air Force Station, Florida*
County: Brevard

Dear Ms. Naylor:

This office reviewed the referenced project for possible effects on historic properties listed, or eligible for listing, on the *National Register of Historic Places.* The review was conducted in accordance with Section 106 of the *National Historic Preservation Act of 1966*, as amended, and its implementing regulations in *36 CFR Part 800: Protection of Historic Properties.*

In May of 2013, New South Associates, Inc. (NSA) conducted an archaeological survey of NASA-owned facilities at the Cape Canaveral Air Force Station (CCAFS) to determine if a historic district exists within the CCAFS Industrial Area. Per survey, the potential district consists of 16 contributing and 3 non-contributing resources within a discontiguous boundary. The properties eligible for listing on the *National Register*, either individually or as a district, are as follows:

Site Name	FMSF Number	Eligibility
Hangar N	8BR3069	As part of district
Little N Storage Bldg.	8BR2190	As part of district
Hangar M Annex	8BR2972	As part of district
Solar Array Test Building	8BR2977	As part of district
E&O Bldg.	8BR2975	As part of district
Missile Assembly Bldg. AE	8BR2976	Individually, and as part of district
Hangar S	8BR3070	Individually, and as part of district
Hangar AF	8BR2001	As part of district
SRB Recovery Slip	8BR2005	As part of district
TVC Deservicing Bldg.	8BR2008	As part of district
High Pressure Gas Facility	8BR2002	As part of district
SRB Paint Facility	8BR2006	As part of district
Robot Wash Facility	8BR2007	As part of district
Multi-Media Blast Facility	8BR2009	As part of district

RELEASED - Printed documents may be obsolete; validate prior to use.

High Pressure Wash Facility	8BR2003	As part of district
First Wash Bldg.	8BR2004	As part of district

We concur with NSA in that these buildings comprise a district that is eligible at the national level of significance under NHPA Criteria A, B, and C. Furthermore, this office agrees that the Paint Storage Building (8BR3072), Emergency Breathing Equipment Building (8BR2961), and the Apollo Warehouse (8BR3071) are not contributing resources to the district.

Based on the information provided, our office concurs with these determinations and finds the submitted report complete and sufficient in accordance with Chapter 1A-46, *Florida Administrative Code.*

If you have any questions, please contact Desiree Estabrook, Historic Sites Specialist, by email at *Desiree.Estabrook@dos.myflorida.com*, or by telephone at 850.245.6333 or 800.847.7278.

Sincerely

Robert F. Bendus, Director
Division of Historical Resources
& State Historic Preservation Officer

FLORIDA DEPARTMENT of STATE

RICK SCOTT
Governor

KEN DETZNER
Secretary of State

Ms. Barbara Naylor, KSC Preservation Officer
Attn: TA-A4C
KSC/NASA
Kennedy Space Center, Florida 32899

March 31, 2014

RE: DHR Project File No.: 2014-0898, Received by DHR: March 10, 2014
Application No.: N/A
Project: *Final Architectural Survey and Evaluation of 45 Facilities That Have reached the Age of 45-50 Years at the Kennedy Space Center*
County: Brevard

Dear Ms. Naylor:

This office reviewed the referenced project for possible effects on historic properties listed, or eligible for listing, on the *National Register of Historic Places.* The review was conducted in accordance with Section 106 of the *National Historic Preservation Act of 1966*, as amended, and its implementing regulations in *36 CFR Part 800: Protection of Historic Properties.*

Thank you for the submission of the final draft report with corrections. Our comments remain the same from review of the initial draft report (DHR#2013-4870, attached). Based on the information provided, our office concurs with these determinations and finds the submitted report complete and sufficient in accordance with Chapter 1A-46, *Florida Administrative Code.*

If you have any questions, please contact Desiree Estabrook, Historic Sites Specialist, by email at *Desiree.Estabrook@dos.myflorida.com*, or by telephone at 850.245.6333 or 800.847.7278.

Sincerely,

Robert F. Bendus, Director
Division of Historical Resources
& State Historic Preservation Officer

Enclosures: copy of DHR#2013-4869

RELEASED - Printed documents may be obsolete; validate prior to use.

FLORIDA DEPARTMENT of STATE

RICK SCOTT
Governor

KEN DETZNER
Secretary of State

Ms. Barbara Naylor, KSC Preservation Officer
Attn: TA-A4C
KSC/NASA
Kennedy Space Center, Florida 32899

November 18, 2013

Re: DHR Project File No.: 2013-4869 (2012-4870) / Received by DHR: October 28, 2013
Architectural Survey and Evaluation of 45 Facilities That Have Reached the Age of 45-50 Years at Kennedy Space Center, Brevard County, Florida

Dear Ms. Naylor:

Our office received and reviewed the above referenced project and accompanying survey report in accordance with Section 106 of the *National Historic Preservation Act of 1966* (Public Law 89-665), as amended in 1992, and *36 C.F.R., Part 800: Protection of Historic Properties,* and Chapters 267 and 373 of the *Florida Statutes*, for possible adverse impact to cultural resources (any prehistoric or historic district, site, building, structure, or object) listed, or eligible for listing, in the National Register of Historic Places (NRHP).

In April 2012, New South Associates Inc. (New South) conducted an architectural survey and evaluation for forty-five (45) buildings and structures that reached 45-50 years of age owned by the Kennedy Space Center (KSC). The project area encompasses buildings located at the KSC and Cape Canaveral Air Force Station (CCAFS). New South found six (6) to be eligible for listing individually on the *National Register*, including the Engineering Development Laboratory (BR2969), Missile Assembly Building AE (BR2976), Beach House (BR2990), Banana River Bridge (BR2955), Indian River Bridge (BR2956), and the Haulover Canal Bridge (BR2957). An additional resource, the Barge Terminal Facility (BR2986), is considered a contributing resource to the Vehicle Assembly Building (VAB) District.

Based on the information provided, our office concurs with these determinations and finds the submitted report complete and sufficient in accordance with Chapter 1A-46, *Florida Administrative Code.*

For any questions concerning our comments, please contact Desiree Estabrook, Historic Sites Specialist, by email at Desiree.Estabrook @dos.myflorida.com or by phone at 850.245.6333. We appreciate your continued interest in protecting Florida's historic properties.

Sincerely,

Robert F. Bendus, Director
Division of Historical Resources
and State Historic Preservation Officer

PC: Mary Beth Reed, Principle Investigator, New South Associates, Inc.

DIVISION OF HISTORICAL RESOURCES

R. A. Gray Building • 500 South Bronough Street • Tallahassee, Florida 32399-0250
Telephone: 850.245.6300 • www.flheritage.com
Commemorating 500 years of Florida history **www.vivaflorida.com**

VIVA FLORIDA 500

VIVA FLORIDA 500

RELEASED - Printed documents may be obsolete; validate prior to use.

EXHIBIT 3-6
MEMORANDUM OF AGREEMENT FOR LC-39 (1974)

RELEASED - Printed documents may be obsolete; validate prior to use.

Advisory Council
On Historic Preservation
1522 K Street N.W. Suite 430
Washington D.C. 20005

MEMORANDUM OF AGREEMENT

WHEREAS, the National Aeronautics and Space Administration proposes modifications to Launch Complex 39 at the John F. Kennedy Space Center, Brevard County, Florida, for the design and development of Space Shuttle facilities; and

WHEREAS, the National Aeronautics and Space Administration has determined that the proposal will have an effect on Launch Complex 39, a property listed on the National Register of Historic Places, and pursuant to Section 106 of the National Historic Preservation Act of 1966, has requested the comments of the Advisory Council on Historic Preservation; and

WHEREAS, pursuant to the procedures of the Advisory Council on Historic Preservation, as published in the Federal Register, January 25, 1974, pp. 3366-3370, representatives of the Advisory Council, the National Aeronautics and Space Administration, and the Florida Historic Preservation Officer, have consulted and reviewed the undertaking to determine the nature of the effect;

THEREFORE:

It is mutually agreed that implementation of the undertaking in accordance with the attached proposal titled "A Joint Memorandum Concerning Modifications/Additions to Launch Complex 39 (A National Register Site) for the Space Shuttle System," will satisfactorily mitigate any adverse effects.

Robert R. Garvey Jr. (date) March 12, 1974
Executive Secretary
Advisory Council on Historic Preservation

(date) 15 Mar 74
National Aeronautics and Space Administration

Nancy K. Shipley (date) April 3 1974
Vice-Chairman
Advisory Council on Historic Preservation

(date) 21 March 74
Florida Historic Preservation Officer

The Council is an independent unit of the Executive Branch of the Federal Government charged by the Act of October 15, 1966 to advise the President and Congress in the field of Historic Preservation.

RELEASED - Printed documents may be obsolete; validate prior to use.

A JOINT MEMORANDUM CONCERNING

MODIFICATIONS/ADDITIONS TO LAUNCH COMPLEX 39 (A NATIONAL REGISTER SITE)

FOR THE SPACE SHUTTLE SYSTEM

Introduction

Launch Complex 39 at the John F. Kennedy Space Center, NASA, was entered in the National Register of Historic Places on May 24, 1973. More than thirteen months before that event, on April 14, 1972, the selection of the Kennedy Space Center as the primary launch and landing site for the Space Shuttle was announced by NASA. Accompanying this announcement was the statement that maximum use would be made of existing facilities at Launch Complex 39 in the design and development of Space Shuttle facilities. The continuing usage of Launch Complex 39 was recognized in preparing the Nomination Form for the National Register, which pointed out that:

> "At the present time, Launch Complex 39 is in much the same configuration as when it was completed, and in which it was used to launch the Apollo manned lunar landing missions. Since it is an operational spaceport, the requirements of future programs may cause changes to be made in existing structures, or new facilities to be added."

Space Shuttle prelaunch activities will resemble in many ways those performed in the past. However, since Launch Complex 39 was originally designed to support the integration, checkout and launch of Apollo/Saturn class vehicles, certain changes are required to adapt the Complex to the requirements of the Space Shuttle's larger, more complex Solid Rocket Booster (SRB)/External Tank (ET)/Orbiter configuration. In addition, safety measures require the separation of some functions in the processing flow for which, due to hazards inherent in some Space Shuttle hardware, past parallel operations are unacceptable.

Current NASA program schedules require that the majority of the necessary changes be completed by the third quarter of calendar year 1978, in time to support the first manned orbital flight, with all changes completed and operational by the second quarter of 1980. The realities of project funding will dictate that the work be performed in several phased increments. For the purposes of this document, however, the changes will be arbitrarily divided into two groups without regard for their actual construction sequence. These two groups are: modifications to existing facilities, and, additional new facilities.

Modifications to Existing Facilities

A. Vehicle Assembly Building (VAB)

Modifications to the Vehicle Assembly Building will be mostly internal,

RELEASED - Printed documents may be obsolete; validate prior to use.

and will have little effect on the present external appearance of the structure. The major change to the exterior of the VAB will be on the North side, to permit the Orbiter to be towed in a horizontal position into the High Bay Transfer Aisle. The North entrance to the building will be widened from its present 55 feet, 4 inches, to 93 feet, 4 inches, thus allowing clearance for the Orbiter's wings. A new, 38-foot wide horizontal sliding leaf will be added to the present horizontal sliding door. The present clear height of 54 feet, 6 inches will be retained except at the center of the entrance, where a 12-foot wide by 6 foot high opening with a sliding vertical door will be added. This will provide a 60-foot high by 12-foot wide central clearance for the vertical tail of the Orbiter. To construct the desired opening, several of the vertical columns in the building's existing steel framing will be partially removed and their structural loads transferred to adjacent columns by the use of trussed framing. In addition, the translucent and metal panel siding of the building and the door canopy framing will be modified to suit the revised opening.

High Bays 1 and 3, on the East side of the VAB, will be modified to serve as the major areas for the mating and integration of Space Shuttle vehicle components. A suitably modified Mobile Launcher will be brought into one of the Bays by an existing Crawler/Transporter and positioned on the existing support columns. The Orbiter/External Tank/Solid Rocket Booster components will then be vertically erected on the Launcher using the existing overhead bridge cranes. The existing extensible work platforms in High Bays 1 and 3 will be vertically repositioned. Vehicle cutouts in each platform will be revised from the present Saturn/Apollo configuration to that of the new shuttle vehicle by structural steel and deck modifications. Folding floor segments will be provided in each platform to allow wing clearance for lowering the Orbiter during erection. Skin interface between the shuttle vehicle and work platform floors and walls will be made with suitable enclosures.

High Bays 2 and 4, on the West side of the VAB, will be modified for receiving, temporary vertical storage, and preliminary inspection/checkout of the Shuttle vehicle's External Tanks. Existing extensible work platforms will be repositioned and modified to provide access to the External Tanks. Additional movable platforms will be provided in these two Bays. The existing bridge cranes will be used to hoist an External Tank, move it across the Transfer Aisle into either High Bay 1 or 3, and lower it for mating with the other components during the Shuttle vehicle assembly process.

Safety regulations for solid-propellant rockets require that a new water deluge system be added in the Transfer Aisle. Modifications and additions will be made to the existing deluge systems in High Bays 1 and 3 for the handling of the Solid Rocket Boosters. The building's existing environmental control system, and its present electrical, pneumatic, hydraulic, and other utility services, will also be modified as necessary to support the erection, mating and integration requirements of the space shuttle vehicle.

RELEASED - Printed documents may be obsolete; validate prior to use.

B. Launch Control Center (LCC)

No changes will be made to the exterior of the Launch Control Center building to adapt it for the space shuttle system. Firing Rooms 1 and 2, within the LCC, will be extensively reconfigured to accommodate part of a new, highly-automated Launch Processing System (LPS) which will be used to control, direct and perform much of the vehicle checkout and launch operations. New computers, operator consoles, and associated electronic equipment will be installed in these two Firing Rooms and in adjacent areas of the building. Firing Rooms 3 and 4 will remain in their present configuration.

C. Mobile Launcher Platforms (MLP)

Each of the three existing Mobile Launchers (or Launcher Umbilical Towers, as they were first known) will undergo major changes to adapt them for the Space Shuttle and will be redesignated as Mobile Launcher Platforms. The most striking visual change will be the removal of the jib crane and the nine service arms from each umbilical tower and the complete disassembly and removal of the 380-foot tall umbilical towers themselves. Only the box-like, two-story, 160-foot long, 135-foot wide and 25-foot high launcher platforms will be retained. The four Saturn hold-down arms on the deck of each launcher platform will be removed. New arms will be installed to support and restrain the complete shuttle vehicle in its vertical launch attitude during checkout in the VAB, during transfer to the launch pad by the Crawler/Transporter, during stay time on the pad, and during thrust buildup at launch. The opening in the center of the launcher platform will be rebuilt and reshaped to permit the free passage of hot exhaust gases from the Orbiter engines and from the nozzles of the two Solid Rocket Boosters. Much of the electronic, mechanical, hydraulic and pneumatic equipment presently located on the two floors (or decks) inside each launcher platform will be removed. New equipment will be installed to route the necessary ground servicing, checkout, and control systems from their VAB or launch pad supply connections to umbilical connections in the aft section of the Shuttle vehicle.

D. Launch Areas A and B

Major changes will be made to the elevated launch pads at Launch Areas A and B. All of the existing structures and equipment on the surface of each pad, presently used for servicing Apollo/Saturn class vehicles, will be removed or relocated with the exception of the six fixed pedestals which support the Mobile Launcher Platform. Fuel, oxidizer, high-pressure gas, electrical, and other launch pad service lines connecting with the Mobile Launcher Platform will be rerouted.

A new, fixed Service and Access Tower will be constructed on the West side of the flame trench at each pad. A swing arm on each Service and Access Tower will include a controlled environment Payload Changeout Room. Each

RELEASED - Printed documents may be obsolete; validate prior to use.

Payload Changeout Room will be triangular in shape with a size of approximately 50 feet per side and 70 feet tall. Environmental control system equipment will be mounted in the Tower structure, with ducting to and from the Payload Changeout Room. Also included within each Service and Access Tower structural framing will be the drive motors and associated reducers, shafts and couplings to rotate the swing arm and Payload Changeout Room from a mated position against the Orbiter to a fully retracted position for launch clearance. A stiffleg derrick mounted atop each Service and Access Tower, and handling equipment within each Payload Changeout Room, will provide the means of removing and replacing payloads. Suitable work platforms and servicing equipment, as well as access to the Orbiter for crew and passengers, will be provided within each Payload Changeout Room.

A new, mobile Solid Rocket Booster flame deflector, with associated moving and anchoring equipment, will be built at each launch pad. A fixed flame deflector for the Orbiter's exhaust will be located in each flame trench. Existing Saturn/Apollo electronic checkout and control equipment located in the Pad Terminal Connection Room beneath each launch pad will be removed, and new Space Shuttle Launch Processing System Equipment will be installed in its place. The emergency egress system at each pad will be revised to accommodate Shuttle requirements.

The existing liquid oxygen, liquid hydrogen, RP-1 and high-pressure gas storage and supply facilities at each Launch Area will require minor relocation of supply lines. A new, blast-protected hypergolic propellants storage and supply facility will be constructed at each Launch Area.

E. Mobile Service Structure (MSS)

The present Mobile Service Structure will not be required to support Space Shuttle operations. The fixed Service and Access Towers to be constructed at each launch pad will take the place of the existing Mobile Service Structure. The probability exists that, following the Apollo/Soyuz Test Project Launch in 1975, it will be declared surplus, dismantled, and removed from Launch Complex 39.

F. Crawler/Transporters and Crawlerway

No changes, modifications, or additions to the two existing Crawler/Transporters or the present Crawlerway between the VAB and Launch Areas A and B will be required for Space Shuttle operations. Only normal and routine maintenance and refurbishment will be necessary.

Additional New Facilities

A. Orbiter Landing Facility

A Landing Facility for the Space Shuttle Orbiter stage will be con-

RELEASED - Printed documents may be obsolete; validate prior to use.

structed near the present Launch Complex 39 area (outside the boundaries of the historical site). Beginning approximately 9,300 feet North and West of the Vehicle Assembly Building, a conventional 300-foot wide, reinforced concrete aircraft runway will extend 15,000 feet to the Northwest. Mechanical arresting devices, to restrain the Orbiter in the event of brake failure, will be installed on the runway near each end. Stabilized overrun areas will extend 1,000 feet beyond each end of the runway.

A landing aids control building will be constructed near the Southeast end of the runway, with an aircraft parking hardstand adjacent to it. The control building will contain closed circuit operational television for takeoff and landing observation, as well as other equipment for flight operations support. A reinforced concrete tow-way for the Orbiter will extend approximately 9,300 feet from a point near the control building to the Orbiter Processing Facility, and then on to the Vehicle Assembly Building.

The Orbiter Landing Facility will be equipped with conventional airfield lighting and with navigational aids to support all-weather airfield operations. Other instrumentation will include the ground components of the Orbiter's electronic landing system.

B. Orbiter Processing Facility

The Orbiter Processing Facility will be constructed near the Northwest corner of the Vehicle Assembly Building, alongside the present Crawler/Transporter parking and maintenance area. This Facility will consist of two hangar-type buildings with a connecting service building between them.

Each hangar will be 193 by 146 feet with a ceiling height of 82 feet, and will be equipped with two 40-ton bridge cranes with 5-ton auxiliary hooks. They will each be environmentally controlled to "clean room" conditions at 100,000 level cleanliness to be maintained at 75 deg. F. and 50% relative humidity. The hangars will contain equipment for safing and deservicing the Orbiter after its return from a mission, and the maintenance and checkout systems to prepare it for the next launch.

The two-story service building connecting the two hangars will be approximately 189 by 98 feet in area. Located in the service building will be: electrical and electronic areas; a Launch Preparation System area; a communications equipment room; a mechanical equipment room; a general shop area; and, storage, office, locker and toilet areas.

C. Solid Rocket Booster Facility

A Solid Rocket Booster Facility will be located to the South and West of the barge turning basin. A part of the LC-39 Press Site is presently in the area where this Facility will be built. This Facility will have two functions. Newly fabricated and refabricated Booster segments (six segments per Booster) will be received from the manufacturer by rail or barge. They

RELEASED - Printed documents may be obsolete; validate prior to use.

will be processed in a 58,000 square foot Booster processing building before being placed on wheeled segment transporters and towed to the Vehicle Assembly Building by tractor-type tugs. Expended Boosters, jettisoned from the ascending Shuttle vehicle and lowered by parachute, will be returned to this Facility by the ocean recovery vessel. A revolving gantry crane (with a capacity of 300 tons @ 50 feet, or 100 tons @ 140 feet), moving on its own 1,570-foot rail system, will remove the expended Boosters from the recovery vessel and place them on wheeled casing dollys. Tugs will tow them into a 36,400 square foot disassembly building, where the Boosters will be disassembled into segments and processed before being shipped to the manufacturer for refurbishment and refabrication.

Other handling equipment will include a 45-ton mobile crane, bridge cranes within the two buildings, and the necessary access and work stands. Approximately 925 linear feet of bulkheading will be installed on the turning basin, and about 7,800 feet of railroad spurs (or sidings) will be laid into the Facility from the nearby Kennedy Space Center railroad. The Facility will have its own electrical power substation, groundwater storage tank and pumphouse, and hot water generator.

Mitigation of Adverse Effects of Changes

The modifications and additions required to adapt Launch Complex 39 for the space shuttle system will not affect the original physical layout of the Complex. The basic arrangement of major facilities: the Vehicle Assembly Building and the adjacent Launch Control Center; the Crawlerway extending from them to the two Launch Areas; the Launch Areas themselves with their elevated launch pads; will all remain. The method of conducting checkout and launch operations will also be similar to that employed in the past for Saturn/Apollo manned lunar landing missions: i.e., vertical erection and assembly on a launcher within an enclosed building; transport of the vehicle and launcher to a distant launch pad; remote automated direction and control of integration, checkout and launch by electronic means from a single firing room.

The changes planned for Launch Complex 39 will make the development of an operational Space Shuttle system possible. Such a system will enable man not only to work routinely in near-Earth space, but also to proceed with exploration of the other planets of the Solar system. This in itself will represent another major milestone in the history of technology.

The establishment of Launch Complex 39 as the major Earth terminal for the Space Shuttle system will be a fulfillment of its original concept as an operational spaceport, and will further enhance its historical value and interest. Continued public access will not only be permitted but will be

RELEASED - Printed documents may be obsolete; validate prior to use.

encouraged, through the medium of escorted bus tours from an enlarged and expanded Visitors Information Center.

(Signature) Robert W. Williams

(Date) 21 March 74

State of Florida

Historic Preservation Officer

(Signature) _____

(Date) _____

Director, Historical Office

National Aeronautics and Space Administration

RELEASED - Printed documents may be obsolete; validate prior to use.

EXHIBIT 3-7
LOAN AGREEMENT FOR RESTORATION AND MOVEMENT OF THE SATURN V LAUNCH VEHICLE (1994)

RELEASED - Printed documents may be obsolete; validate prior to use.

FAX: 407-867-2097

SMITHSONIAN INSTITUTION
NATIONAL AIR AND SPACE MUSEUM
7th and Independence Avenue, S.W. Washington, D. C. 20560

KSC-PLN-173 Rev. A-1 01882

KCA-1417 - Rev. Basic

Office of the Registrar
(202) 357-2717

AGREEMENT FOR OUTGOING LOAN

NASA/Kennedy Space Center ATTENTION: David Dickinson
(borrower's name)

Deputy Director, Public Affairs Office, NASA PA, Kennedy Space Center, FL 32899
(address) (telephone)

from: Department of Space History 202-357-2828
(curatorial unit) (telephone)

In accordance with the conditions printed on the reverse, the objects listed below are to be borrowed for the following purpose only:
Exhibit at the Kennedy Space Center

for the period April 12, 1991 to June 30, 2019

Location of object while on loan As above. Object is not to be moved from this location wthout prior, written consent of NASM.

Initiated by: [signature]
(curator's signature)

Accession and Catalog Number	Description of Objects	Value for Insurance Purposes
NASM 6211 1979-0128	Saturn V Launch Vehicle w/attach	$5,000,000

(attach continuation sheet if necessary)

INSURANCE: (please see conditions on reverse)

- ☐ to be carried by Smithsonian and premium billed to borrower
- ☐ to be carried by borrower
- ☒ insurance waived

SHIPPING AND PACKING:

Object (s) will be packed by Object already in place charges to borrower: yes ____ no ____

Object (s) will be shipped to (address): ____

Object (s) will be shipped from NASM ☐ or other (address): ____

Shipment to be via: OUTGOING: ____
RETURN : Contact: Office of Registrar, Ellen Folkema 202-357-2883

CREDIT LINE: On loan from the National Air and Space Museu, Smithsonian Institution
(for exhibition label catalog)

SPECIAL REQUIREMENTS for installation and handling: To be handled by authorized persons only. Packing, crating and shipping to be reviewed in advance by the Registrar.

(attach continuation sheet if necessary)

SI-1233 rev 4-21-86

(OVER)

RELEASED - Printed documents may be obsolete; validate prior to use.
RELEASED - Printed documents may be obsolete; validate prior to use.

ALL LOANS OF OBJECTS FROM THE COLLECTION OF THE NATIONAL AIR AND SPACE MUSEUM
THE BORROWER'S AGREEMENT TO THE FOLLOWING CONDITIONS:

KSC-PLN-1733 Rev A-1

PROTECTION

Each item is deemed received in good condition unless otherwise reported to NASM in accordance with the second and third paragraphs below.

Each object shall at all times be given due care to insure it against loss, damage, or deterioration. The borrower shall maintain constant and adequate protection from hazards of fire, insects, vermin, dirt, unusual temperatures and humidity, excessive light, theft, and mishandling by unauthorized or inexperienced persons or by the public. Objects must be secured from damage or theft by appropriate railings, display cases and other responsible means. Should loss or damage be noted, regardless of who may be responsible therefor, the [illegible] of NASM shall be informed immediately and a full written report with photographs shall follow. Should damage occur during transit, NASM and the carrier shall be notified at once, and all packing materials shall be saved until the carrier or its agent has had an opportunity to inspect them.

[illegible] requires no more than special requirements for installation and handling as noted on the face of this agreement form. Upon receipt and prior to unpacking of the object, the borrower must make a [illegible] record of condition. The borrower must furnish the Registrar of NASM with a copy of the record of condition.

[illegible] by NASM shall [illegible] in the condition in which they are [illegible] approval is obtained from NASM [illegible] retouched, or altered in any [illegible] except with the written [illegible]

[illegible]

[illegible] that borrower's policy, NASM reserves [illegible] the [illegible] of insurance or copy of [illegible] satisfactory insurance is [illegible]

If the Smithsonian Institution insures, this agreement will act as proof of or as a certificate of all-risk, wall-to-wall insurance coverage subject to standard exclusions.

Unless otherwise agreed upon, insurance will be waived for [illegible] the United States Government Agencies. However, such an[illegible] shall be responsible for the costs of repair or replacement of objects should damage or loss occur due to negligence during the period of the loan (from the time the loan leaves NASM until it is returned to NASM).

PACKING AND TRANSPORTATION

All packing, transportation, and customs formalities shall be arranged by the borrower through firms approved in advance by NASM, and all costs thereof shall be paid in full by the borrower. Unpacking and repacking must be done by experienced personnel under competent supervision. Repacking must be done with similar materials, [illegible] boxes, and by the same methods as the objects were received. Any additional instructions will be followed.

CREDITS AND REPRODUCTIONS

Each object shall be labeled and credited in any publication [illegible] National Air and Space Museum, Smithsonian Institution. Unless otherwise agreed to in writing, no reproductions are permitted except photographic copies for personal use and [illegible] for the sole purpose of the loan. The [illegible] furnish the Registrar of any such catalogs and publicity.

COSTS

[illegible]

RETURN, EXTENSION, CONSERVATION

[illegible]

NASM official [illegible] the Registrar [illegible] present [illegible] the borrower.

In the event [illegible] form and this Agreement for Outgoing Loan, the terms of agreement shall be controlling.

[illegible] in the document and certify that I am [illegible] and [illegible] hereto.

Signature J. A. Thomas for Robert L. Crippen date 8-26-94
(Borrower or authorized agent)

Title Director, John F. Kennedy Space Center

Approved for the National Air and Space Museum:

Ellen Folkerma date 8/24/94

Title Registrar

RELEASED - Printed documents may be obsolete; validate prior to use.
RELEASED - Printed documents may be obsolete; validate prior to use.

EXHIBIT 3-8
MEMORANDUM OF AGREEMENT FOR THE
LC-34 ENGINEERING SUPPORT BUILDING (2006)

RELEASED - Printed documents may be obsolete; validate prior to use.

MEMORANDUM OF AGREEMENT BETWEEN THE NATIONAL AERONAUTICS AND SPACE ADMINISTRATION AND THE FLORIDA STATE HISTORIC PRESERVATION OFFICE REGARDING THE DEMOLITION OF LAUNCH COMPLEX 34, ENGINEERING SUPPORT BUILDING, AT THE CAPE CANAVERAL AIR FORCE STATION, FLORIDA

WHEREAS, the National Aeronautics and Space Administration (NASA) has a new vision to return to the moon and ultimately travel to Mars and beyond, and to accomplish this, NASA must manage its limited resources and maximize the use of its facilities (including abandoned or unused facilities, equipment, and structures); and

WHEREAS, NASA proposes to undertake the action to demolish the Launch Complex 34 (LC-34) Engineering Support Building (ESB), a contributing structure located in the Cape Canaveral Air Force Station National Historic Landmark (NHL) District. The building has been abandoned for operations since February 1998, and demolition will reduce operational cost; and

WHEREAS, NASA has determined that such undertaking is considered an adverse effect on the NHL and has consulted with the State Historic Preservation Office (SHPO), Advisory Council on Historic Preservation (ACHP), and the Department of Interior, National Park Service (NPS) in accordance with 36 CFR Part 800; and

WHEREAS, the NPS, SHPO, ACHP, as well as interested members of the public (North Brevard Historical Society, Spacewalk Hall of Fame, Brevard County Historical Commission, North Brevard Heritage Foundation, Air Force Space and Missile Museum, and the Apollo One Memorial Foundation), were afforded an opportunity to participate in the process leading to this MOA at a November 16, 2005, meeting at the Kennedy Space Center (KSC); and

WHEREAS, the facility is also located atop a significantly and extensively contaminated Solid Waste Management Unit area and NASA is evaluating remedies to restore the environment; and

WHEREAS, the demolition activities are planned to start in Fiscal Year 2007 and remediation activities continue afterwards (however, this effort is outside the scope of this Agreement); and

NOW, THEREFORE, all parties have agreed that NASA could proceed with the proposed undertakings in accordance with the following stipulations in order to take into

RELEASED - Printed documents may be obsolete; validate prior to use.

account the effects of the project on the historic landmark, and that these stipulations shall govern the project until this Agreement expires or is terminated.

Stipulations

NASA will ensure that the following measures are carried out:

1. Prior to the demolition of the ESB, the historic property will be documented to Historic American Building Survey/Historic American Engineering Record Level II standards in accordance with the Secretary of the Interior's Standards for Architectural and Engineering Documentation, as published in the Federal Register, 48 F.R.44730-44734, September 29, 1983. Documentation will include the following items:

   a. Reproduction of as-built drawings of the ESB as large format black and white prints and negatives that are of archival quality.

   b. Black and white archival quality photos with large format negatives of exterior and interior views of the ESB, as appropriate, as well as special technological features or engineering details.

   c. A written history and description of the LC-34 ESB and its use in a manner consistent with the Level II standards of the Secretary of the Interior's Standards and Guidelines for Historic Documentation (48 F.R. 44728-30).

2. Pursuant to Section 110(b) of the National Historic Preservation Act, before the ESB is demolished, NASA shall ensure that all documentation is complete.

3. Copies of all documentation will be provided to the Secretary of the Interior for incorporation into the National Architectural and Engineering Records in the Library of Congress as provided in Section 101 of the National Historic Preservation Act and implementing procedures. Copies of the documentation will also be provided to the Florida SHPO and the KSC Historian.

4. Qualified professionals should survey the building to identify if any artifacts or structural elements are worthy of salvage for preservation. However, it is understood that contamination may preclude that possibility.

5. If the terms of the Agreement have not been implemented within three years of signing, this Agreement shall be considered null and void. In such event, NASA shall so notify the parties to this Agreement, and if it chooses to continue with the undertaking, shall reinitiate review of the undertaking in accordance with 36 CFR. Part 800.

RELEASED - Printed documents may be obsolete; validate prior to use.

Key Personnel: The following personnel are designated as key officials and are the principal points-of-contact between the parties in the performance of this Agreement:

NASA-KSC:

Mario Busacca
KSC Historic Preservation Officer
NASA Kennedy Space Center
Mail Code: TA-C3
Kennedy Space Center, FL 32899

Phone: 321-867-8456
Fax: 321-867-8040
E-mail: <Mario.Busacca-1@nasa.gov>

SHPO:

Laura Kammerer
Deputy Historic Preservation Officer
for Review and Compliance
State Historic Preservation Office
500 South Bronough Street
Tallahassee, FL 32399-0250
Phone: 850-245-6333
Fax: 850-245-6437
E-mail: <LKammerer@dos.state.fl.us>

Execution of this Agreement by NASA and the SHPO and implementation of its terms evidences that NASA has afforded all parties a reasonable opportunity to comment on its proposed undertakings affecting this NHL under Sections 106 and 110(f) of the National Historic Preservation Act and that NASA has taken into account the effects of the project on historic properties.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

By: James W. Kennedy 9/27/06
James W. Kennedy DATE
Director, John F. Kennedy Space Center

FLORIDA STATE HISTORIC PRESERVATION OFFICE

By: Frederick P. Gaske 10/5/06
Frederick P. Gaske DATE
Florida State Historic Preservation Officer

RELEASED - Printed documents may be obsolete; validate prior to use.

CONCURRENCE SHEET FOR SPACE ACT AGREEMENT

DATE: 08/25/2006

DESCRIPTION:
LC-34 Engineering Support Building (ESB) MOA

PARTNER:
Florida State Historic Preservation Office

ORIGINATING OFFICE:

Name/Title of Division Chief	Signature	Date
Steve Brisbin for Chief, Medical & Environmental Mgmt. Div	Kelly A [illegible]	09/01/06

APPROVAL OF DIRECTOR:

Name/Title of Director	Signature	Date
Michael J. Benik Director, Center Operations	Michael J. Benik	9/8/06

CONCURRENCES

DIVISION OR OFFICE	SIGNATURE	DATE
TA-C3/Harold Williams	Harold Williams	8/29/06
TA-C3/Diane K. Callier	for Harold Williams	8/29/06
TA-E/Nancy P. Bray	Nancy P. Bray	9/8/06
DX-D1/Scott P. Stilwell	Scott P. Stilwell	9/14/06
OP/Dudley R. Cannon Director, Procurement	Dudley R Cannon, Jr	9-20-06
for CC/Jerald D. Stubbs Chief Counsel	Tracy Lee Belford	9/20/06
AA-B/James E. Hattaway, Jr. Associate Director	James E Hattaway Jr	9-26-06
AA-A/W. W. Parsons Deputy Director	(TDY)	

REMARKS / COMMENTS:

KSC FORM 2-263 NS (REV. 02/06) PREVIOUS EDITIONS ARE OBSOLETE

c9921
9/25

RELEASED - Printed documents may be obsolete; validate prior to use.

EXHIBIT 3-9
MEMORANDUM OF AGREEMENT FOR THE REMOVAL OF THE SUN LOUVERS AND REPLACMENT OF THE WINDOWS ON THE LAUNCH CONTROL CENTER (2008)

RELEASED - Printed documents may be obsolete; validate prior to use.

KCA-4188
Rev: Basic

MEMORANDUM OF AGREEMENT BETWEEN THE NATIONAL AERONAUTICS AND SPACE ADMINISTRATION AND THE FLORIDA STATE HISTORIC PRESERVATION OFFICE REGARDING REMOVAL OF THE SUN LOUVERS AND REPLACEMENT OF THE WINDOWS ON THE LAUNCH CONTROL CENTER (BUILDING K6-0900) AT THE KENNEDY SPACE CENTER, FLORIDA

WHEREAS, the National Aeronautics and Space Administration (NASA) proposes to undertake the action to remove the sun louvers and replace the existing windows (replaced in 1992) on the Launch Control Center (LCC), Building K6-0900, located at the Kennedy Space Center (KSC), Florida, with a new window glazing system due to structural deterioration of the sun louvers and upper pivot attach points to the weathered corrosion aluminum skin panels and continued intrusion of water in the interior windows; and

WHEREAS, NASA has determined that such undertaking is considered an "adverse effect" on the Historic Property (8BR1685) designated under the Apollo program and eligible under the Space Shuttle program, and significant under the National Register of Historic Places (NRHP) Criteria A (*associated with events that have made a significant contribution to the broad patterns of our history*) and Criteria C (*that embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction*), and also applies to Criteria Consideration G (*a property achieving significance within the past 50 years if it is of exceptional importance*); and

WHEREAS, NASA has safety concerns relating to the four interior firing rooms which house unique, technical, and sophisticated launch control equipment as well as to the surrounding exterior facilities and personnel within the vicinity of the complex; and

WHEREAS, the facility was built in 1965 to control the prelaunch and launch operations of the Saturn V and IB launches and presently controls the Space Shuttle launch vehicles, serving a vital role as the "hub/brains" of Launch Complex 39, and

WHEREAS, several trade studies have been performed to evaluate the corrosion and hazard levels of the sun louvers to withstand Category 3-5 hurricanes: *Study to Assess Protection of Critical NASA Assets from the Potential of an Extreme Wind and Water Event at KSC,* prepared by AJT & Associates, Inc., EQE International, Inc., and DHI, Inc. (June 2000), and a *Requirements Study to Refurbish Windows & Louvers, LCC*, prepared by Reynolds, Smith and Hills, Inc. (November 2006), in which both studies recommended removal of the sun louvers

RELEASED - Printed documents may be obsolete; validate prior to use.

before losing critical flight launch processing equipment and/or creating a possible and continued risk to personnel; and

WHEREAS, in 2006, several options were reviewed to replace the sun louvers and window system to correct the water intrusion problems and deterioration of the sun louvers. NASA requirements were established to: (1) meet current hurricane codes, (2) stop water intrusion, (3) correct glare problems, (4) select the best engineering solution for a sloped surface, (5) minimize downtime for Firing Rooms, and (6) consider life-cycle cost factors. The options included: (1) remove, repair, and replace sun louvers; (2) repair and/or replace glass and gaskets in existing frames; and/or (3) replace glass and frame. The option selected by NASA-KSC was to remove the frame, gasket, glass, and louvers and install a new frame and glass in the outer plane with interior roll shades (see Appendix A); and

WHEREAS, the sun louvers were designed to reduce the glare for the test/flight conductors and were not designed as a "blast shield," and reengineering and upgrades would be required to meet hurricane protection codes. Such repairs to the sun louvers would be costly and time consuming , and the components would always require maintenance. NASA has determined that due to the deterioration and cost to repair and maintain, it is not cost-effective or technically advisable to retain the sun louvers; and

WHEREAS, NASA has consulted with both the State Historic Preservation Office (SHPO) and the Advisory Council on Historic Preservation (Council) in accordance with 36 CFR Part 800; and

WHEREAS, NASA has given interested local members of the public (North Brevard Historical Society, Spacewalk Hall of Fame, Brevard County Historical Commission, North Brevard Heritage Foundation, Air Force Space and Missile Museum, and the Apollo One Memorial Foundation) an opportunity to comment on the proposed project. In June 2007 two responses were received and both agreed that removal of the sun louvers and windows will change the appearance of the facility and that Level II Historic American Buildings Survey/ Historic American Engineering Record (HABS/HAER) documentation should be done prior to removal.

NOW, THEREFORE, the consulting parties agree that the undertaking, which will have adverse effects on the historic property, shall be implemented in accordance with the following stipulations to satisfy the requirements of Sections 106 and 110 of the National Historic Preservation Act (NHPA) and its implementing regulations.

Stipulations

NASA will ensure that the following measures are carried out:

RELEASED - Printed documents may be obsolete; validate prior to use.

Documentation

1. Prior to the removal of the sun louvers, the LCC will be documented to HABS/HAER Level II Standards in accordance with *The Secretary of the Interior's Standards for Architectural and Engineering Documentation*, as published in the Federal Register, 48 FR 44730-44734, dated September 29, 1983. Documentation will include the following items:

a. Reproduction of as-built drawings of the LCC as large format black and white prints and negatives that are of archival quality.

b. Black and white archival quality photos with large format negatives of exterior and interior views of the LCC as appropriate, as well as special technological features or engineering details.

c. A written history and description of the LCC and its function in a manner consistent with the Level II Standards of *The Secretary of the Interior's Standards and Guidelines for Historic Documentation* (48 FR 44728-30).

2. Firing Rooms 2, 3, and 4 within the LCC will be documented as described in Stipulation 1 above.

3. NASA shall ensure that all documentation is complete before the sun louvers and window units are removed.

4. Copies of all documentation will be provided to the Secretary of the Interior for incorporation into the National Architectural and Engineering Records in the Library of Congress as provided in Section 101 of the NHPA and implementing procedures. Copies of the documentation will also be provided to the Florida SHPO and the KSC Archivist.

Preservation Planning

A Programmatic Agreement with the SHPO and the Council for the administration of all programs that may have an effect on historic properties at the KSC will be executed.

General and Administrative Stipulations

1. Professional Qualifications – Qualified professionals will perform the documentation in accordance with *The Secretary of the Interior's Professional Qualifications Standards,* 36 CFR Part 61.

2. Dispute Resolution – Should any signatory to this Memorandum of Agreement (MOA) object at any time to any actions proposed or the manner in which the terms of this MOA are implemented, NASA shall consult with such party to resolve the objection. If NASA determines that such objection cannot be resolved, NASA will:

RELEASED - Printed documents may be obsolete; validate prior to use.

a. Forward all documentation relevant to the dispute, including NASA's proposed resolution to the Council. The Council shall provide NASA with its advice on the resolution of the objection within thirty (30) days of receiving adequate documentation. Prior to reaching a final decision on the dispute, NASA shall prepare a written response that takes into account any timely advice or comments regarding the dispute from the Council and/or signatory and provide them with a copy of this written response. NASA will then proceed according to its final decision.

b. If the Council does not provide its advice regarding the dispute within the thirty (30) day time period, NASA may make a final decision on the dispute and proceed accordingly. Prior to reaching such a final decision, NASA shall prepare a written response that takes into account any timely comments regarding the dispute from the signatory to the MOA and provide them and the Council with a copy of such written response.

c. NASA's responsibilities to carry out all other actions subject to the terms of this MOA that are not the subject of the dispute remain unchanged.

3. Amendments – This MOA may be amended when such an amendment is agreed to in writing by all signatories. The amendment will be effective on the date a copy signed by all of the signatories is filed with the Council.

4. Termination – If NASA determines that it cannot implement the terms of the MOA and they have not been implemented within three (3) years of signing, unless the signatories agree in writing to an extension for carrying out its terms or the SHPO determines that the MOA is not properly implemented, NASA or the SHPO may propose that it be terminated. The signatory proposing to terminate this MOA will so notify the other signatory to this MOA, explaining the reason(s) for termination and affording them at least thirty (30) calendar days to consult and seek alternatives to termination. Should such consultation fail and the MOA be terminated, NASA will consult in accordance with 36 CFR Section 800.6(c)7 to develop a new MOA.

Execution of this MOA by NASA and the SHPO and implementation of its terms evidences that NASA has afforded the SHPO a reasonable opportunity to comment on its proposed undertakings affecting this Historic Property under Sections 106 and 110(f) of the NHPA and that NASA has taken into account the effects of the project on historic properties.

RELEASED - Printed documents may be obsolete; validate prior to use.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

for By: _____ 7-8-08
W. W. Parsons
Director, John F. Kennedy Space Center
DATE

FLORIDA STATE HISTORIC PRESERVATION OFFICE

By: _____ 7/15/08
Frederick P. Gaske
Florida State Historic Preservation Officer
DATE

RELEASED - Printed documents may be obsolete; validate prior to use.

APPENDIX A

RS&H
IMPROVING YOUR WORLD

Options

Option	1	2	3	4	5	6	7
	Keep: glass/frame/ gaskets - Rebuild: louvers	Keep: glass/frame/ gaskets - Remove: louvers (install interior roll-shade)	Keep: frame - Replace: gaskets and glass (disregarding louvers)	Keep: frame - Replace: glass and gaskets (with special designed gaskets) (disregarding louvers)	Remove: frame/gasket/ glass/louvers - Install: new frame/glass in same plane (interior roll-shades)	Remove: frame/gasket/ glass/louvers - Install: new frame/glass in outer plane (5') (interior roll-shades)	Remove: gasket/glass - Install: new frame/glass to existing frame (disregarding louvers)
Meets Current Codes (Hurricane)	NO X	NO X	NO X	NO X	YES √	YES √	YES √
Will Leak (continued repairs)	YES X	YES X	YES X	probably	NO √	NO √	NO √
Glass will delaminate	YES X	YES X	YES X	probably	NO √	NO √	NO √
Tested, Proven System	NO X	NO X	NO X	NO X	YES √	YES √	YES √
Designed for Slope	NO X	NO X	NO X	NO X	YES √	YES √	YES √
Warranties Available	NO X	NO X	NO X	NO X	YES √	YES √	YES √
Off-the-shelf parts	NO X (louvers)	YES √	YES √	NO X (gasket)	YES √	YES √	YES √
Standard design & installation	NO X (louvers)	YES √	YES √	NO X (gasket)	YES √	YES √	YES √
Utilize Insulated glass	NO X	NO X	NO X	NO X	YES √	YES √	YES √
Continued Maintenance	YES X	YES X	YES X	probably	NO √	NO √	NO √
Temp Waterproofing Req'd	NO √	NO √	YES X	YES X	YES X	NO √	YES X
Firing Room Interuption during Construction (least 0 - 10)	2 (no sun-control)	3 (installation of roll-shades)	6	6	10	1	
Water Intrusion Risk during construction (least 0 - 10)	0	0	4	3	5	0	
Construction duration	6	4	8	6	6	4	
Cost Comparison	$10 million	$460,000	$360,000	$800,000	$3.4 million	$3.9 million	$3.4 million

RELEASED - Printed documents may be obsolete; validate prior to use.

EXHIBIT 3-10
MEMORANDUM OF AGREEMENT REGARDING THE DEMOLITION OF THE MISSION CONTROL CENTER (2009)

RELEASED - Printed documents may be obsolete; validate prior to use.

MEMORANDUM OF AGREEMENT AMONG THE NATIONAL AERONAUTICS AND SPACE ADMINISTRATION, JOHN F. KENNEDY SPACE CENTER AND THE FLORIDA STATE HISTORIC PRESERVATION OFFICE, AND THE ADVISORY COUNCIL ON HISTORIC PRESERVATION AND THE DEPARTMENT OF INTERIOR, NATIONAL PARK SERVICE REGARDING THE DEMOLITION OF THE MISSION CONTROL CENTER AT THE CAPE CANAVERAL AIR FORCE STATION, FLORIDA

WHEREAS, the National Aeronautics and Space Administration (NASA) has a new vision to return to the moon and ultimately travel to Mars and beyond, and to accomplish this, NASA must manage its limited resources and maximize the use of its facilities (including abandoned or unused facilities, equipment, and structures); and

WHEREAS, NASA must reduce operational costs associated with keeping these abandoned facilities safe and secure with tight budgetary and high security constraints and will align facility needs for future missions and goals of NASA; and

WHEREAS, NASA-John F. Kennedy Space Center (NASA-KSC) proposes to undertake the action to demolish the original Mission Control Center (MCC) at Cape Canaveral Air Force Station (CCAFS), which is one of the discontiguous properties that is part of the CCAFS National Historic Landmark (NHL), designated on April 16, 1984. This NHL was designated prior to the completion of the National Park Service (NPS) Man in Space Theme Study (May 1984), which led to NHL designation for a number of NASA facilities; and

WHEREAS, this NHL is associated with the manned space program that resulted in the landing of Americans on the surface of the moon in 1969, the unmanned scientific exploration of space and near-space and Earth environment, and the worldwide network of facilities that tracked the space flights around the earth; and

WHEREAS, NASA has determined that such undertaking is an adverse effect on the NHL and has consulted with the State Historic Preservation Office (SHPO), Advisory Council on Historic Preservation (ACHP), and the Department of Interior, National Park Service, in accordance with the ACHP's regulations implementing Section 106 of the National Historic Preservation Act (NHPA), 36 CFR Part 800, Protection of Historic Properties; and

WHEREAS, other interested members of the public (North Brevard Historical Society, Spacewalk Hall of Fame, Brevard County Historical Commission, North

RELEASED - Printed documents may be obsolete; validate prior to use.

Brevard Heritage Foundation, Air Force Space and Missile Museum, and the Apollo One Memorial Foundation) were also afforded an opportunity to participate in the process leading to this Memorandum of Agreement (MOA) both at a November 16, 2005, meeting at the Kennedy Space Center (KSC) and in followup correspondence; and

WHEREAS, some of the contributing elements of the facility, known as the Control Room consoles and equipment, were removed in October 1999 to the then newly designed Early Space Exploration (ESE) Exhibit at the KSC Visitor Complex, allowing access to the historic artifacts by more visitors and tours on a daily basis; and

WHEREAS, a significant effort would be required to renovate the MCC to acceptable levels to support tours (e.g., relocation and reinstallation of the original Control Room, asbestos/mildew abatement, compliance upgrades associated with the Americans with Disabilities Act for tours, replacement of the entire roof system and the HVAC system, replacing the equipment in the machine room, as well as associated chilled water piping, etc.); and

WHEREAS, NASA has looked at several alternatives for the facility, including refurbishing the facility for nonadministrative uses (e.g., storage) and exploring whether nonprofit organizations (private, Federal, and state sources) could assist in solicitation of funds for planning, refurbishment, and management of all or portions of the building.

NOW, THEREFORE, NASA has determined that there are no operational or administrative uses for the facility in its current and future programs and no other party could be identified to take control of this facility, that demolition will reduce operational costs, and that NASA could proceed with the proposed undertaking in accordance with the following stipulations in order to take into account the effects of the project on the NHL. These stipulations shall govern the project until this Agreement expires or is terminated or all conditions are met.

Stipulations

NASA-KSC will ensure that the following measures are carried out:

I. Documentation

A. Prior to the demolition of the MCC, NASA-KSC will contact the NPS Southeast Regional Office, National Historic Landmarks Program Manager in Atlanta, Georgia, and the SHPO to determine what level and kind of Historic American Building Survey/Historic American Engineering Record (HABS/HAER) documentation is required for the NHL property. The SHPO and NPS will be provided the opportunity to review and comment on drafts of the documentation. Unless otherwise agreed by the NPS, NASA-KSC will ensure that all documentation is completed and accepted by HABS/HAER prior to the demolition.

B. Copies of all documentation will be provided to the SHPO, NPS, and the KSC Archivist.

RELEASED - Printed documents may be obsolete; validate prior to use.

C. HABS/HAER photography will be carried out pursuant to this Agreement by or under the direct supervision of a person or persons meeting at a minimum the Secretary of the Interior's Professional Qualifications Standards (48 FR 44738-9) for Historians and Architectural Historians.

II. Other Mitigation Measures

A. ESE Exhibit – NASA-KSC will augment the display at the ESE Exhibit at the KSC Visitor Complex by relocating one of the two original NASA logos currently on the side of the MCC into the existing exhibit area coupled with the creation of an interpretive graphic panel featuring a pictorial collection of images of the MCC during its peak operational period. These additions will serve as a means to effectively communicate to the public the exact location of the MCC Control Room within the footprint of the facility previously on CCAFS. NASA-KSC will make a good faith effort on the development of an interactive, three dimensional (3D) computer animation to show how the MCC actually worked. If an interactive, 3D computer animation is not feasible, NASA will include information on how the MCC worked in the interpretive graphic panels.

B. NASA-KSC MCC Web Site – An MCC Web site will be developed to facilitate the dissemination of the MCC story for use by adults and school children. This Web site will provide a detailed history of the MCC's role in the early United States manned and unmanned space programs at Cape Canaveral, including the Mercury-Redstone, Mercury-Atlas, and Gemini missions, and how the MCC controlled these flights and utilized the worldwide tracking network. The Web site will also include information on the MCC building itself and may also include information on all the activities that involved the MCC through the course of its active use. NASA-KSC will permit the SHPO and NPS to review and comment on the Web site prior to final production on the NASA-KSC Web page.

C. Artifact Identification and Collection – When the consoles and related equipment were removed from the MCC for display at the ESE Exhibit, several items were left behind, including electronic panels and original display screens. These were not removed at the time, because it was determined they did not add to the integrity of the display. It must be noted here that, at the time, this display was not designed to be an exact duplicate for preservation purposes. Rather, it was to be a display to provide a sense of what the Control Room looked like at the time it was operational.

1. Prior to demolition, all historic artifacts remaining in the Control Room will be identified, removed, inventoried, properly cataloged, and stored.

2. An inventory of the artifacts will be provided to the SHPO and the NPS at completion of their removal and cataloging, prior to demolition of the MCC.

3. These items will be stored and, if possible, incorporated into the Visitor Complex ESE Exhibit when it is renovated as part of the Astronaut Hall of Fame

RELEASED - Printed documents may be obsolete; validate prior to use.

relocation. The current target for implementation of the relocation of the Astronaut Hall of Fame is no earlier than the 2015 timeframe.

4. NASA-KSC will permit the SHPO and NPS to review and comment on the Visitor Complex ESE Exhibit plans.

D. State Historic Marker – NASA-KSC will be responsible for the placement of a State Historic Marker on the original site of the MCC.

1. Placement will be coordinated with the CCAFS.

2. The marker text will be coordinated with the Florida Marker Council and the NPS.

E. Digital Video Disk (DVD)/Video Documentation – NASA-KSC will produce a DVD/video documenting the MCC, the building itself and its role in the early space programs, including how the MCC controlled the space flights and used the worldwide tracking network.

1. The DVD/video will incorporate current and historic recordings. NASA-KSC will inform the SHPO and NPS if availability is an issue.

2. The DVD/video will be supplemented with documentation of the re-created Control Room at the KSC Visitor Complex.

3. NASA-KSC will permit the SHPO and NPS to review and comment on DVD/video drafts.

4. When completed, copies will be made available at the KSC Visitor Complex and donated to selected libraries and schools.

F. Programmatic Agreement – NASA-KSC will develop a Programmatic Agreement with the SHPO for the management of all Historic Properties on the KSC.

III. Administration

A. Implementation Schedule – If the terms of the Agreement, with the exception of the relocation of the historic artifacts from the Control Room to the ESE Exhibit, have not been implemented within five years of signing, this Agreement shall be considered null and void. In such event, NASA-KSC shall so notify the parties to this Agreement, and if it chooses to continue with the undertaking, shall reinitiate review of the undertaking in accordance with 36 CFR Part 800.

B. Dispute Resolution – Should any signatory party to this Agreement object in writing to NASA-KSC regarding any undertakings proposed or initiated pursuant to this Agreement, NASA-KSC shall consult with the objecting party to try to resolve the objection. If NASA-KSC determines that the objection cannot be resolved through

RELEASED - Printed documents may be obsolete; validate prior to use.

consultation, the Agency shall forward all documentation relevant to the objection to the ACHP, including NASA-KSC's proposed response to the objection. Within 30 days after receipt of all pertinent documentation, the ACHP will either:

1. Provide written concurrence with the proposed response to the objection, whereupon NASA-KSC will respond to the objection accordingly; or

2. Provide NASA-KSC with recommendations, which NASA-KSC will take into account in reaching a final decision regarding the dispute; or

3. Notify NASA-KSC that the objection will be referred for comment pursuant to 36 CFR 800.7(a)(4) and proceed to refer the objection and comment. NASA-KSC shall take the resulting comment into account in accordance with 36 CFR 800.7(c)(4) and Section 110(1) of the NHPA.

Should the ACHP not exercise one of the above options within 30 days after receipt of all pertinent documentation, NASA-KSC will assume the ACHP's concurrence in its proposed response to the objection and will respond to the objection accordingly. Any recommendation or comment provided by the ACHP will be understood to pertain only to the subject of the dispute.

C. Amendments – Any signatory party to this Agreement may request that it be amended, whereupon the signatory parties will consult to consider such an amendment. All parties must signify their acceptance of the proposed changes to the Agreement in writing within 30 days of their receipt. This Agreement shall only be amended by a written instrument executed by all the parties. Where no consensus can be reached, the Agreement will not be amended.

D. Termination – Any signatory party to this Agreement may terminate it by providing 30 days notice to the other parties, provided that the parties will consult during the period prior to termination to seek agreement on amendments or other actions that would avoid termination. In the event of termination, NASA-KSC will comply with the requirements of 36 CFR Part 800 (800.3 through 800.6) with regard to individual undertakings otherwise covered by this Agreement.

E. Anti-Deficiency Act – All activities pursuant to this Agreement are subject to the availability and allocation of appropriated funds for such purposes. Should NASA-KSC be unable to fulfill the terms of this Agreement, they will immediately notify the SHPO, NPS, and ACHP and consult to determine whether to amend or terminate the Agreement pending the availability of resources.

F. Effective Date and Duration – The effective date of this Agreement will be the date of the last signature.

Execution of this Agreement among NASA, SHPO, and the NPS and implementation of its terms evidences that NASA has afforded all parties a reasonable opportunity to comment on its proposed undertakings affecting this NHL under Sections 106 and 110(f)

RELEASED - Printed documents may be obsolete; validate prior to use.

Execution of this Agreement among NASA, SHPO, and the NPS and implementation of its terms evidences that NASA has afforded all parties a reasonable opportunity to comment on its proposed undertakings affecting this NHL under Sections 106 and 110(f) of the NHPA and that NASA-KSC has taken into account the effects of the project on historic properties.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

By: _____ 28 JAN 09
Robert D. Cabana
Director, John F. Kennedy Space Center
DATE

FLORIDA STATE HISTORIC PRESERVATION OFFICE

By: _____ 2/3/09
Frederick P. Gaske
Florida State Historic Preservation Officer
DATE

ADVISORY COUNCIL ON HISTORIC PRESERVATION

By: _____ 2/13/09
John M. Fowler
Executive Director
DATE

DEPARTMENT OF INTERIOR, NATIONAL PARK SERVICE

By: _____ 3/10/09
David Vela
for Regional Director
Southeast Region
DATE

RELEASED - Printed documents may be obsolete; validate prior to use.

EXHIBIT 3-11
PROGRAMMATIC AGREEMENT REGARDING NASA FACILITIES DESIGNATED AS NATIONAL HISTORIC LANDMARKS (1989)

RELEASED - Printed documents may be obsolete; validate prior to use.

PROGRAMMATIC AGREEMENT
AMONG THE
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION,
THE NATIONAL CONFERENCE OF STATE HISTORIC PRESERVATION OFFICERS,
AND THE
ADVISORY COUNCIL ON HISTORIC PRESERVATION

WHEREAS, the National Aeronautics and Space Administration (NASA) undertakes research, development, space mission operations, and management use of its facilities which have been designated as National Historic Landmarks (Landmarks) (Attachment 1); and

WHEREAS, such facilities require frequent modification over the life of agency missions to adapt them to meet the requirements of ongoing NASA programs; and

WHEREAS, NASA has determined that such modifications may have an effect on those Landmarks, and has consulted with the National Conference of State Historic Preservation Officers (NCSHPO) and the Advisory Council on Historic Preservation (Council) pursuant to the regulations (36 CFR Part 800) implementing Sections 106 and 110(f) of the National Historic Preservation Act, as amended (16 U.S.C. 470f and 470h-2(f)); and

WHEREAS, the Department of the Interior, National Park Service (NPS) was invited and participated in the consultation;

NOW, THEREFORE, NASA, the NCSHPO, and the Council agree that the programs shall be implemented in accordance with the following stipulations in order to take into account the effect of the programs and specific undertakings on the Landmarks.

Stipulations

NASA will ensure that the following measures are carried out.

I. Categories of Activities

A. When the proposed undertaking involves any of the following activities, NASA shall consult with the appropriate SHPO and, as necessary, the Council in accordance with Stip. II:

1. Demolition, dismantling, or relocation of original engineering structures, or of buildings housing facilities;
2. Removal or excessing of significant elements of the Landmarks specifically named on the National Register nomination forms;
3. New construction not compatible with major portions of the original structure or which alter the characteristics of the

RELEASED - Printed documents may be obsolete; validate prior to use.

facility which were specified as the reason for its Landmark designation; or

4. Changes in function, purpose, or use of a facility.

B. When the proposed undertaking is limited to the following activities that will not alter the characteristics of the facility which were specified as the reason for its landmark designation, NASA shall develop and implement mitigation measures in accordance with Stipulation III:

1. Replacement of historic hardware or components;
2. Modification of the original structure or equipment used in engineering structures, or buildings housing facilities; or
3. New construction compatible with existing structure, purpose, and operation of the facility.

NASA shall include a description of such activities and mitigation measures in the annual summary of its activities prepared pursuant to Stipulation IV.A.

C. When the proposed undertaking involves none of the activities specified above, NASA may proceed without consultation or the implementation of mitigation measures.

II. Consultation Process

A. Consultation required under Stip. I.A. shall be conducted as follows:

1. NASA shall provide the following documentation to the SHPO for review:
a. a description of the undertaking, with photos, maps, and drawings;
b. a description of the affected Landmark;
c. a description of the effects of the undertaking on the affected Landmark;
d. a description of alternatives to the proposed action, which were considered if any, and reasons not chosen;
e. a description of any mitigation measures proposed;
f. a description of NASA's effort, if appropriate, to obtain and consider views of affected interested persons on the proposed undertaking, including a copy of any comments received; and
g. the planning and approval schedule for the proposed undertaking.

Whenever feasible, NASA shall give the SHPO advance notice that such documentation is under preparation, and advise the SHPO of a date certain that it intends to submit the documentation to the SHPO.

RELEASED - Printed documents may be obsolete; validate prior to use.

2. The SHPO shall respond to a written request for consultation (accompanied by the documentation specified in Stip. II.A.1) within 20 working days, and agree, conditionally agree, or disagree with NASA's proposal.

3. If NASA does not accept the SHPO's conditions, or if NASA and the SHPO disagree, NASA shall notify the Council and forward copies of the documentation specified in Stip.II.A.1, above, along with other information relevant to the dispute.

4. Within 20 working days, the Council shall either: (1) attempt to resolve the dispute; (2) provide NASA with recommendations to be taken into account in implementing the activity; or (3) decide to comment, and comment within 45 working days of that decision. At NASA's request, the time periods in Stips. II.A.2. and II.A.4. will run concurrently. In exceptional circumstances NASA may request accelerated consideration under Stip. II.A.4. and the Council will make a good faith effort to accommodate such requests. The Council may consult with the National Park Service of the Department of the Interior during its review period.

B. The Council and the NCSHPO recognize that operational emergency situations may arise where NASA must take immediate action without prior consultation with the appropriate SHPO or the Council. In such situations, NASA shall notify the Council and the SHPO of such actions as soon as practicable.

III. Mitigation

Mitigation measures shall be carried out prior to undertaking actions specified in Stips. I.A. and I.B.

A. Recordation

1. Recordation shall be done in accordance with the Secretary of the Interior's "Standards for Architectural and engineering Documentation" (Standards) (Federal Register, 48 FR 190, pp. 44730-44734, September 29, 1983).

2. Because original "as-built" drawings and other records are on file at the installations containing Landmark facilities, documentation will normally include the following: (1) reproduction of existing "as-built" drawings and site plans modified on standard size (19 x 24 or 24 x 36) mylar; and (2) provision of black and white archival quality photos with large format negatives of exterior and interior views, as appropriate, as well as special technological features or engineering details.

3. Original copies of all documentation shall be provided to the Secretary of the Interior in accordance with the Standards for incorporation into the National Architectural and Engineering Records in the Library of Congress as provided in Section 101 of the National Historic Preservation Act and implementing procedures. Copies of the documentation shall also be provided to the appropriate SHPO.

RELEASED - Printed documents may be obsolete; validate prior to use.

B. Salvage

NASA will apply its agreement with the Smithsonian Institution (NASA Management Instruction 4310.4) to determine appropriate retention and curation activities with respect to significant artifacts.

IV. Continuing Coordination

A. On or about December 1, 1990, and annually thereafter, NASA will provide a summary of its activities under this Agreement to the Council and to the NCSHPO.

B. In consultation with the appropriate SHPO, the Council may review and comment upon individual undertakings when it determines that historic preservation issues warrant such action.

C. NASA will provide appropriate public information about activities under Stip.I.A. to interested parties upon request.

D. Any party to this Agreement may terminate it by providing 60 days notice to the other parties, provided that the parties will consult during the period prior to termination to seek agreement on amendments or other actions that would avoid termination.

Execution of this Programmatic Agreement and carrying out its terms evidences that NASA has afforded the Council and the NCSHPO a reasonable opportunity to comment on its programs affecting Landmarks under Sections 106 and 110(f) of the National Historic Preservation Act, and that NASA has taken into account the effects of its programs on these Landmarks.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

By: _____ 9/29/89
Associate Administrator for Management — Date

NATIONAL CONFERENCE OF STATE HISTORIC PRESERVATION OFFICERS

By: _____ 10/6/89
President — Date

ADVISORY COUNCIL ON HISTORIC PRESERVATION

By: _____ September 18, 1989
Chairman — Date

RELEASED - Printed documents may be obsolete; validate prior to use.

ATTACHMENT 1

NASA's NATIONAL HISTORIC LANDMARKS

(as of 2/24/89)

1. Variable Density Tunnel (Langley Research Center, Hampton, VA)
2. Full Scale Tunnel (Langley Research Center, Hampton, VA)
3. Eight-Foot High Speed Tunnel (Langley Research Center, Hampton, VA)
4. Unitary Plan Wind Tunnel (Ames Research Center, Moffett Field, CA)
5. Rocket Engine Test Facility (Lewis Research Center, Cleveland, OH)
6. Zero-Gravity Research Facility (Lewis Research Center, Cleveland, OH)
7. Spacecraft Propulsion Research Facility (Lewis Plum Brook Operations Facility)
8. Redstone Test Stand (George C. Marshall Space Flight Center, AL)
9. Propulsion and Structural Test Facility (George C. Marshall Space Flight Center, AL)
10. Rocket Propulsion Test Complex (Stennis Space Center, MS)
11. Saturn V Dynamic Test Stand (George C. Marshall Space Flight Center, AL)
12. Lunar Landing Research Facility (Langley Research Center, Hampton, VA)
13. Rendezvous Docking Simulator (Langley Research Center, Hapmton, VA)
14. Neutral Bouyancy Space Simulator (George C. Marshall Space Flight Center, AL)
15. Space Environment Simulation Laboratory (Lyndon B. Johnson Space Center, Houston, TX)
16. Spacecraft Magnetic Test Facility (Goddard Space Flight Center, Greenbelt, MD)
17. Twenty-Five-Foot Space Simulator (Jet Propulsion Laboratory, Pasadena, CA)
18. Pioneer Deep Space Station (Goldstone Deep Communications Complex, CA)
19. Space Flight Operations Facility (Jet Propulsion Laboratory, Pasadena, CA)
20. Apollo Mission Control Center (Lyndon B. Johnson Space Center, Houston, TX)

RELEASED - Printed documents may be obsolete; validate prior to use.

EXHIBIT 3-12
PROGRAMMATIC AGREEMENT REGARDING MANAGEMENT OF HISTORIC PROPERTIES AT KSC (2009)

RELEASED - Printed documents may be obsolete; validate prior to use.

PROGRAMMATIC AGREEMENT AMONG THE NATIONAL AERONAUTICS AND SPACE ADMINISTRATION JOHN F. KENNEDY SPACE CENTER, ADVISORY COUNCIL ON HISTORIC PRESERVATION, AND THE FLORIDA STATE HISTORIC PRESERVATION OFFICER REGARDING MANAGEMENT OF HISTORIC PROPERTIES AT THE KENNEDY SPACE CENTER, FLORIDA

WHEREAS, following the January 14, 2004, speech by President George W. Bush outlining a new space exploration initiative to return to the Moon and ultimately travel to Mars and beyond, the National Aeronautics and Space Administration (NASA) released The Vision for Space Exploration, now, Exploration mission, which outlined the Agency's approach to the new direction in space exploration; and

WHEREAS, in 2006 NASA announced the start of the Constellation Program (CxP), which included development of a new class of exploration vehicles to launch both crew and cargo and associated infrastructure in exploring the Moon, Mars, and beyond; and

WHEREAS, NASA's greatest challenges and top priorities will be to safely fly out the Space Shuttle manifest, complete assembly of the International Space Station, and honor commitments to our international partners prior to retiring the Shuttle in 2010, all while developing the new Constellation space systems and preparing them for flight as soon as possible after the Shuttle's last mission; and

WHEREAS, to accomplish the Exploration mission, NASA must manage its limited resources and maximize the use of its facilities (including unoccupied facilities, equipment, and structures), which includes the phase-out of the Space Shuttle program (SSP) in the year 2010; and

WHEREAS, today NASA's John F. Kennedy Space Center (NASA-KSC) is primarily responsible for processing and launching Space Shuttle missions. NASA-KSC manages the ground operations, including pre- and postlaunch support and landing and recovery planning and execution, along with support to robotic missions and management of NASA-KSC facilities; and

WHEREAS, in order for NASA-KSC to support the Exploration mission, some of their historically significant facilities and/or structures will require modifications to meet the requirements of new and ongoing NASA programs. Such modifications may result in adverse effects to these historic properties, as defined in 36 CFR Part 800, Protection of Historic Properties; and

RELEASED - Printed documents may be obsolete; validate prior to use.

WHEREAS, NASA-KSC recently completed its inventory and evaluation of the SSP historic properties at KSC, which includes a listing of historically significant facilities and/or structures located in or associated with such properties and historic districts, and that the inventory and evaluation was approved by the Florida State Historic Preservation Officer (SHPO) on May 27, 2008 (reference Appendix A); and

WHEREAS, some of those facilities located at NASA-KSC are listed or determined eligible for inclusion on the National Register of Historic Places (NRHP) in the contexts of the Apollo program and SSP (see Appendix B); and

WHEREAS, some of the historic facilities at NASA-KSC associated originally with the Apollo program have been reused, modified, or replaced as the SSP became operational, and some of these, along with historic facilities associated originally with the Space Shuttle, will be reused, modified, or replaced as the CxP becomes operational; and

WHEREAS, NASA-KSC, in consultation with the SHPO and the Advisory Council on Historic Preservation (ACHP), developed this Programmatic Agreement (PA) pursuant to Section 800.14 of the regulations (36 CFR Part 800) implementing Section 106 of the National Historic Preservation Act (NHPA), as amended (16 U.S.C. 470f); and

WHEREAS, NASA-KSC elected to fulfill its obligations under Section 106 of the NHPA through execution and implementation of this PA, as provided in 36 CFR Part 800; and

WHEREAS, the purpose of this PA is to ensure that the historic, engineering, and architectural values (reference "*Balancing Historic Preservation Needs with the Operation of Highly Technical or Scientific Facilities*," dated 1991) of the historic properties under the jurisdiction of NASA-KSC are recognized and considered in the course of ongoing NASA programs and to provide a protocol for the reuse, modification, replacement, or removal of historic facilities associated with current and future programs; and

WHEREAS, this PA covers the management of existing and future historic, ground-based facilities and structures that are listed or determined eligible on the NRHP that are owned by NASA-KSC; and

WHEREAS, this PA does not cover the listed National Historic Landmarks (NHLs) covered under an existing agreement among the National Aeronautics and Space Administration, the National Conference of State Historic Preservation Officers, and the Advisory Council on Historic Preservation, dated October 1989, regarding NASA's designated NHLs and the listed or determined eligible archaeological sites owned by NASA-KSC; and

WHEREAS, when a new facility and/or structure is listed or determined eligible on the NRHP, this PA will be applicable and the same process will be implemented.

RELEASED - Printed documents may be obsolete; validate prior to use.

NOW, THEREFORE, all signatories agree that NASA-KSC can proceed with those undertakings in accordance with the following stipulations in order to take into account the effects of its undertakings on the historic properties and/or structures and that these stipulations shall govern the management of historic properties and/or structures in satisfaction of NASA-KSC's Section 106 responsibilities under the NHPA, until this PA expires or is terminated.

STIPULATIONS

NASA-KSC will ensure that the following measures are carried out:

I. KSC Historic Properties and Cultural Resources Management Plan

A. NASA-KSC will update the Cultural Resources Management Plan every five (5) years.

B. NASA-KSC will update its inventory of historic properties every five (5) years.

II. Categories of Undertakings

A. When the proposed action involves any category of undertaking that is listed in Appendix C and therefore exempt from the Section 106 review as agreed to by NASA-KSC, the SHPO, and the ACHP, NASA-KSC can proceed with their proposed undertaking without public notification or consultation from the SHPO and/or the ACHP.

B. Any signatory party to this PA can propose additions to the list of undertakings that do not require consultation listed in Appendix C. These undertakings will be added to Appendix C if mutually agreed upon by all signatory parties.

C. The following undertakings involving facilities listed or determined eligible in Appendix B require consultation with the SHPO and, as appropriate, the ACHP in accordance with Stipulation III, as necessary, and the implementation of mitigation measures, in accordance with Stipulations IV and V. After consultation and agreement of mitigation measures, no further agreement document will be required for implementation of undertaking.

1. Demolition and dismantlement, including the physical destruction of, or damage to, all or part of the historic property and/or structure.

2. Alterations including, but not limited to, the replacement of building materials with noncompatible materials and additions to historic properties and/or structures; removal or excessing of historically

RELEASED - Printed documents may be obsolete; validate prior to use.

significant elements/equipment; significant changes to floor plans; and partial demolition.

3. New construction within or proximate to the boundaries of the historic property and/or structure where such new construction adversely affects those qualities that make the property significant, including creating a visually intrusive element, or is of noncompatible design and placement.

4. Repair and maintenance, if such actions result in a change in the existing structural integrity, operational function, or visual integrity of the historic property and/or structure.

5. Neglect, including the reduction or withdrawal of maintenance, resulting in deterioration of historically significant elements.

6. Transfer, sale, or lease of the historic property and/or structure to another agency or non-Federal entity without appropriate and enforceable preservation covenants.

7. Removal of the historic property and/or structure from its historic setting.

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

III. Consultation

A. In consultation with the SHPO, NASA-KSC shall apply the criteria of effect and adverse effect in accordance with 36 CFR Part 800.4(d) and 5(a). NASA-KSC shall provide to the SHPO the appropriate information and documentation as set out in 36 CFR Part 800.11(d) and (e).

B. When a determination is made that an undertaking may have an adverse effect, NASA-KSC shall provide the following documentation to the SHPO for review and notify the ACHP:

1. A description of the undertaking with photographs, maps, and drawings.

2. A description of the affected historic property and/or structure.

3. A description of alternatives considered to avoid or minimize adverse effects to the historic property and/or structure and the reasons why they were not chosen.

RELEASED - Printed documents may be obsolete; validate prior to use.

4. A description of NASA-KSC's efforts, if appropriate, to obtain and consider views of affected, interested persons on the proposed undertaking including a copy of any comments received.

5. An approved planning schedule for the proposed undertaking.

C. The SHPO has thirty (30) days to comment on the proposed undertaking. If the SHPO fails to respond within thirty (30) days of receipt of a request for review of a finding or determination and its supporting documentation set out above, NASA-KSC may either proceed to the next step in the process based on the finding or determination or consult with the ACHP in lieu of the SHPO.

IV. Mitigation of Adverse Effects

A. When NASA-KSC, in consultation with the SHPO, determines that program activities will adversely affect those qualities that qualify an historic property and/or structure for listing or determined eligible on the NRHP, and that avoidance or in-place preservation is not feasible, NASA-KSC shall ensure that a mitigation plan is developed for these properties.

B. When it is determined that an undertaking will have an adverse effect, NASA-KSC will arrange for public participation and take steps to involve individuals, organizations, and entities likely to be interested, pursuant to 36 CFR 800.2(d)(1) and (2). NASA-KSC will provide appropriate public information about activities to interested parties upon request.

C. NASA-KSC will ensure that all mitigation measures are developed in consultation with the SHPO, and will be appropriate to the nature of the undertaking, and take into account the character-defining elements which make the respective historic property and/or structure listed or eligible for inclusion on the NRHP. Appropriate treatments for each undertaking will, as appropriate, include one or more of the measures identified in Stipulation V.

D. Should NASA-KSC and the SHPO not agree on the terms of the mitigation plan, then NASA-KSC will request the ACHP's comments in accordance with Stipulation VIII.C, "Dispute Resolution."

E. NASA-KSC will ensure that qualified professionals meeting the *Secretary of the Interior's Professional Qualifications Standards* (48 FR 44716, dated September 29, 1983) will conduct all identification, evaluation, and documentation of historic properties and will ensure that the contents of all documents and studies prepared by contractors meet applicable standards and guidelines.

RELEASED - Printed documents may be obsolete; validate prior to use.

F. NASA-KSC, whenever feasible, shall give the SHPO and/or the ACHP advance notice that such documentation is being prepared and advise them when NASA-KSC intends to forward said documentation.

G. Unless the SHPO and/or the ACHP objects within thirty (30) working days of receipt of the documentation on the adequacy, appropriateness, or extent of any mitigation plan, NASA-KSC shall ensure that the mitigation plan is implemented, pursuant to 36 CFR 800.5(c)(1).

V. Mitigation Options

A. Recordation:

1. In accordance with Section 110 of the NHPA, recordation will be undertaken prior to substantial alteration or demolition. Recordation will consist of drawings, photographs, written documentation, video or audio recordings, or any other medium or any combination thereof, to be determined in consultation with the SHPO. Standard recordation may include the following:

   a. Hard copies or digital reproductions of existing "as-built" drawings and site plans or creation of new measured drawings.
   b. Perspective-corrected film or digital photographs showing representative exterior and interior views, as appropriate, as well as contributing features such as special technological features or engineering details.
   c. A written historic narrative.

2. If there are multiple assets of a specific property type (e.g., three Mobile Launcher Platforms, two Payload Canisters, two Launch Pads A and B, and two Crawler Transporters) that are 95 percent identical, NASA-KSC will provide recordation of only one of the assets as part of the mitigation for all assets as fulfillment of the Section 106 obligations such as reuse, transfer, demolition, etc.

3. NASA-KSC plans to conduct early recordation of their historic facilities and/or structures listed or determined eligible on the NRHP to support mitigation efforts required by Section 106 obligations to support future programs.

4. Recordation may consist of an assemblage of existing materials in NASA-KSC's own collection or other relevant repository. In such cases where existing materials do not adequately record the historic property and/or the contributing features, NASA-KSC shall produce new drawings, photographs, written narratives, or other materials, as appropriate.

RELEASED - Printed documents may be obsolete; validate prior to use.

5. Copies of all materials, such as Historic American Building Survey/Historic American Engineering Report, will be provided to the SHPO and/or the National Park Service as well as the KSC Archivist. Records shall be deposited with an appropriate agency or repository for future use and reference.

6. Recordation materials subject to Export Control and International Traffic in Arms Regulations will be distributed to a publicly accessible repository capable of managing classified or other secure materials, such as the National Archives and Records Administration.

B. **Salvage and/or Artifacts**. Architectural or scientific/engineering elements from historic properties scheduled for demolition and dismantlement will be salvaged, where appropriate.

1. NASA-KSC will ensure that salvage will not be undertaken without prior documentation, as described in Stipulation V.A. Qualified professionals meeting the *Secretary of the Interior's Professional Qualifications Standards* shall survey the historic property to identify if any artifacts or structural elements are worthy of salvage for preservation purposes.

2. NASA-KSC shall ensure that the items selected are removed in a manner that minimizes damage.

3. NASA-KSC will apply its most recent agreement with the Smithsonian Institution ("Agreement Between the National Aeronautics and Space Administration and the Smithsonian Institution Concerning the Transfer and Management of Historical Artifacts"), as set forth in NASA Procedural Requirements 4310.1, to determine appropriate retention and curation activities with respect to significant artifacts.

4. In consultation with the SHPO, NASA-KSC will make available salvaged architectural or scientific/engineering elements not wanted by the Smithsonian to appropriate state and local museums and historical organizations that can demonstrate the ability to preserve and interpret these elements.

C. **Public Interpretation**: A variety of public interpretation initiatives will be undertaken, as appropriate, for the purpose of enhancing the public's undertaking of NASA-KSC's historic properties. These include, but are not limited to:

1. Web-based products for educational purposes featuring the historic property and/or structure as part of the heritage of NASA-KSC. This

RELEASED - Printed documents may be obsolete; validate prior to use.

product will be hosted on NASA's Web site for millions around the world to experience.

2. Reports and pamphlets suitable for the general public describing the historic property and/or structure and its role in the United States space program.

3. Collection and assembling of documents, including testing schedules, technical reports, public relations materials, historic photographs, engineering drawings, maps, etc.

4. Identification, collection, preservation, and display of significant objects relating to the history of NASA-KSC, including tools, instruments, scale models, clothing, etc.

5. The systematic collection of oral histories from long-term NASA-KSC and contractor employees, providing information on employee experiences and social history not available in written sources.

D. **Offsite Mitigation.** In keeping with the National Aeronautics and Space Act of 1958 which charges NASA with the development of public education and outreach programs, NASA-KSC will, as appropriate, undertake the following:

1. Provide support for research and written popular and technical histories and other accounts.

2. Provide support for the existing offices of Agency Historians and Archivists to further the increased dissemination of historical documentation and official Agency histories already available but little known outside of NASA.

3. Foster opportunities for public/private partnerships that have been established by NASA's excess property disposition processes to preserve the tangible elements of America's manned and unmanned space programs through artifact donations in order to share pieces of the NASA-KSC's history with public institutions.

E. **Adaptive Reuse**: Where feasible, historic buildings and/or structures which no longer support NASA-KSC's ongoing programs may be adaptively reused. The NASA-KSC Real Property Officer will compile and maintain an updated list of such buildings and/or structures, their size and condition, so that when new space is needed these can be considered for reuse.

RELEASED - Printed documents may be obsolete; validate prior to use.

VI. Archaeological Discoveries

A. In the case of undertakings that involve ground disturbance on or adjacent to identified archaeological sites, NASA-KSC will consider ways to avoid adverse effects to these sites. If adverse effects cannot be avoided, NASA-KSC will determine, in consultation with the SHPO/Tribal Historic Preservation Officer (THPO), an appropriate mitigation plan.

B. In the case of undertaking that involve ground disturbance of less than one (1) acre in size, but no identified archaeological sites are present within or adjacent to the project area, NASA-KSC shall proceed without further consultation regarding archaeological resources. If, however, archaeological resources, including burials, funerary objects, or other archaeological artifacts are discovered during the course of the work, NASA-KSC shall cease work immediately, limit access to the site, and consult with the SHPO/THPO in accordance with the ACHP's regulations (36 CFR Part 800.13) to determine and implement the appropriate identification, evaluation, and mitigation plan.

VII. Emergency Situations

In those situations where unanticipated and sudden events, including, but not limited to, floods, fires, and/or hurricanes that result in or that cause or effect the alterations of the structural stability of a historic property and/or structure, rendering it an immediate health and safety hazard, NASA-KSC will take the necessary steps to comply with the ACHP's regulations for emergency situations (36 CFR Part 800.12) and make the historic property and/or structure safe and secure. Within ten (10) days, or as soon as practicable, NASA-KSC shall notify the SHPO or the ACHP of such actions, providing a brief description of the nature of the emergency and corrective work.

VIII. Administrative Stipulations

A. **Programmatic Agreement.** Execution of this PA does not prohibit NASA-KSC from developing other agreement documents to govern the management of historic properties and/or structures at NASA-KSC, provided that subsequent agreements meet the intent of this Agreement. This PA does not supersede the existing PA among the National Aeronautics and Space Administration, the National Conference of State Historic Preservation Officers, and the Advisory Council on Historic Preservation, dated October 1989, regarding NASA's designated NHLs.

B. **Definitions.** Appendix D contains a list of terms and definitions in accordance with 36 CFR Part 800.16.

C. **Dispute Resolution.** Should any signatory party to this PA object in writing to NASA-KSC regarding any undertakings proposed or initiated pursuant to

RELEASED - Printed documents may be obsolete; validate prior to use.

this PA, NASA-KSC shall consult with the objecting party to try to resolve the objection. If NASA-KSC determines that the objection cannot be resolved through consultation, the Agency shall forward all documentation relevant to the objection to the ACHP, including NASA-KSC's proposed response to the objection. Within thirty (30) days after receipt of all pertinent documentation, the ACHP will either:

1. Provide written concurrence with the proposed response to the objection, whereupon NASA-KSC will respond to the objection accordingly; or

2. Provide recommendations, which NASA-KSC will take into account in reaching a final decision regarding the dispute; or

3. Notify NASA-KSC that the objection will be referred for comment pursuant to 36 CFR 800.7(a)(4) and proceed to refer the objection and comment. NASA-KSC shall take the resulting comment into account in accordance with 36 CFR 800.7(c)(4) and Section 110(1) of the NHPA.

Should the ACHP not exercise one of the above options within thirty (30) days after receipt of all pertinent documentation, NASA-KSC will assume ACHP's concurrence in its proposed response to the objection and will respond to the objection accordingly. Any recommendation or comment provided by the ACHP will be understood to pertain only to the subject of the dispute.

D. **Annual Report and Review**. Beginning one (1) year after execution of this PA, and every year thereafter, NASA-KSC will prepare an annual report summarizing the status of compliance with the terms of this PA and a summary of the activities for the past year. Annual reports will be submitted by the end of the calendar year by NASA-KSC to all signatories. The signatories to this PA will review the annual report and determine whether revisions to the PA are needed within thirty (30) days of the submission of the annual reports. If all signatories agree that revisions to the PA are needed, such revisions will be implemented pursuant to Stipulation VIII.E., "Amendments." NASA-KSC shall also ensure that its annual report is made available for public inspection, that potentially interested members of the public are made aware of its availability, and that interested members of the public are invited to provide comments to the ACHP, the SHPO, and NASA-KSC.

E. **Amendments.** Any signatory party to this PA may request that it be amended, whereupon the signatory parties will consult to consider such an amendment. All parties must signify their acceptance of the proposed changes to the PA in writing within thirty (30) days of their receipt. This PA

RELEASED - Printed documents may be obsolete; validate prior to use.

shall only be amended by a written instrument executed by all the parties. Where no consensus can be reached, the PA will not be amended.

F. **Termination.** Any signatory party to this PA may terminate it by providing thirty (30) days notice to the other parties, provided that the parties will consult during the period prior to termination to seek agreement on amendments or other actions that would avoid termination. In the event of termination, NASA-KSC will comply with the requirements of 36 CFR Part 800 (800.3 through 800.6) with regard to individual undertakings otherwise covered by this PA.

G. **Anti-Deficiency Act**. All activities pursuant to this PA are subject to the availability and allocation of appropriated funds for such purposes. Should NASA-KSC be unable to fulfill the terms of this PA, they will immediately notify the ACHP and the SHPO and consult to determine whether to amend or terminate the PA pending the availability of resources.

H. **Sunset Clause.** If the terms of the PA have not been implemented within three (3) years of signing, this PA shall be considered null and void. In such event, NASA-KSC shall so notify the signatories to this PA, and if they choose to continue with the undertaking, shall reinitiate review of the undertaking in accordance with 36 CFR Part 800.

I. **Effective Date and Duration**. The effective date of this PA will be the date of the last signature. The signatory parties agree this PA is subject to the annual review required in Stipulation VIII.D. and shall continue in full force until it is amended or terminated, as provided in Stipulation VIII.E. and F., respectively.

RELEASED - Printed documents may be obsolete; validate prior to use.

Execution and implementation of this PA evidences that NASA-KSC has satisfied its Section 106 responsibilities under the NHPA for all individual undertakings for current and future programs.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

By: Robert D Cabana 8 APR 09

Robert D. Cabana — DATE
Director, John F. Kennedy Space Center

FLORIDA STATE HISTORIC PRESERVATION OFFICE

By: Frederick P. Gaske 4/13/09

Frederick P. Gaske — DATE
Florida State Historic Preservation Officer

ADVISORY COUNCIL ON HISTORIC PRESERVATION

By: John M. Fowler 5/18/09

John M. Fowler — DATE
Executive Director, Advisory Council on Historic Preservation

RELEASED - Printed documents may be obsolete; validate prior to use.

APPENDIX A

FLORIDA DEPARTMENT OF STATE
Kurt s. Browning
Secretary of State
DIVISION OF HISTORICAL RESOURCES

May 27, 2008

Ms. Barbara Naylor
Mail Code TA-C4
John F. Kennedy Space Center, NASA
Kennedy Space Center, FL 32899

Re: SHPO/DHR Project File No: 2007-9035
Received: December 6, 2007
Survey and Evaluation of NASA-owned Historic Facilities and Properties In the Context of the U.S. Space Shuttle Program – John F. Kennedy Space Center – Brevard County, Florida
Archaeological Consultants, Inc.; October 2007

Dear Ms. Naylor:

Our office received and reviewed the above referenced survey report in accordance with Section 106 of the *National Historic Preservation Act of 1966* as amended in 1992; *36 C.F.R., Part 800: Protection of Historic Properties*; and Chapter 267, *Florida Statutes*, for assessment of possible adverse impact to cultural resources (any prehistoric or historic district, site, building, structure, or object) listed, or eligible for listing, in the *National Register of Historic Places (NRHP)*.

In October 2007, Archaeological Consultants, Inc. completed an intensive survey of Space Shuttle Program (SSP) facilities and properties at Kennedy Space Center (KSC) on behalf of the National Aeronautics and Space Administration. One hundred and twelve (112) properties were identified and evaluated. Seventy-six (76) properties were determined to meet the criteria of eligibility for listing in the *NRHP*, or are currently listed in the *NRHP*; and 40 properties identified and evaluated did not meet the criteria for listing in the NRHP. Of the 76 NRHP eligible properties, 26 of them are individually eligible properties, and the remaining properties are contributing resources one of the six historic districts. Four new districts were identified, in addition to the two previously NRHP listed districts at KSC.

500 S. Bronough Street • Tallahassee, FL 32399-0250 • http://www.flheritage.com
☐ Director's Office (850) 245-6300 • FAX: 245-6436
☐ Archaeological Research (850) 245-6444 • FAX: 245-6452
☒ Historic Preservation (850) 245-6333 • FAX: 245-6437

RELEASED - Printed documents may be obsolete; validate prior to use.

Ms. Barbara Naylor
May 27, 2008
Page 2

Based on the very thorough documentation provided in this unique resource type survey effort, our office concurs with the evaluations completed by ACI and presented by NASA to this office as a completed inventory of SSP facilities and properties at KSC. We find the submitted report sufficient in all aspects of Chapter 1A-46, *Florida Administrative Code*. .

If you have any questions concerning our comments, please contact Laura Kammerer, Deputy State Historic Preservation Officer for Review and Compliance, at 850-245-6333 or lkammerer@dos.state.fl.us. Thank you for your interest in protecting Florida's historic properties.

Sincerely,

Frederick P. Gaske, Director, and
State Historic Preservation Officer

RELEASED - Printed documents may be obsolete; validate prior to use.

APPENDIX B
Historic Properties at Kennedy Space Center
As of November 2008 (Revised March 2014)

Facility Number	*Site File Number*	*Facility Name*	*Associated Programs*	*Listed, Eligible, Individual (I), or Contributing (C) Resource*
K6-848	8BR1684	Vehicle Assembly Building	Apollo Program Space Shuttle Program	Listed, Individual Eligible, Individual
K6-947	No BR #	VAB Annex (contributing to VAB)	Apollo Program	Listed, Contributing
K7-1005	8BR2986	Barge Terminal Facility (contributing to VAB)	Apollo Program Space Shuttle Program	Eligible, Contributing Eligible, Contributing
K6-900	8BR1685	Launch Control Center	Apollo Program Space Shuttle Program	Listed, Individual Eligible, Individual
UK-008	8BR1689	Crawlerway	Apollo Program Space Shuttle Program	Listed, Individual Eligible, Individual
	8BR1688	Crawler Transporter 1&2	Apollo Program Space Shuttle Program	Listed, Individual Eligible, Individual
	8BR1690	Press Site: Clock and Flag Pole	Apollo Program Space Shuttle Program	Listed, Individual Eligible, Individual
M7-399	8BR1691	Headquarters Building	Apollo Program Space Shuttle Program	Listed, Individual Eligible, Individual
M7-355	8BR1693	Operations and Checkout Bldg.	Apollo Program	Listed, Individual
M6-342	8BR1692	Central Instrumentation Facility	Apollo Program	Listed, Individual
L6-247	8BR1998	SRB ARF Manufacturing Building (aka Booster Fabrication Facility Complex)	Space Shuttle Program	Eligible, Individual
M7-657	8BR2014	Parachute Refurbishment Facility	Space Shuttle Program	Eligible, Individual
M7-777	8BR2016	Canister Rotation Facility (aka Launch Abort System Facility)	Space Shuttle Program	Eligible, Individual
	8BR2021	Mobile Launcher Platforms (3)	Space Shuttle Program	Eligible, Individual
K6-494	8BR1997	Rotation/Processing Facility	Space Shuttle Program	Eligible, Individual
M7-360	8BR2671	Space Station Processing Facility	International Space Station Program	Eligible, Individual
K8-1600	8BR2990	Beach House	Apollo Program	Eligible, Individual
M3-0003	8BR2956	Indian River Bridge	Apollo Program Space Shuttle Program International Space Station Program	Eligible, Individual Eligible, Individual Eligible, Individual
E4-2414	8BR2957	Haulover Canal	Apollo Program Space Shuttle Program International Space Station Program	Eligible, Individual Eligible, Individual Eligible, Individual
M7-1150	8BR2955	Banana River Bridge	Apollo Program Space Shuttle Program International Space Station Program	Eligible, Individual Eligible, Individual Eligible, Individual
M7-0409	8BR2969	Engineering Development Lab	Apollo Program	Eligible, Individual

RELEASED - Printed documents may be obsolete; validate prior to use.

APPENDIX B
Historic Properties at Kennedy Space Center
As of November 2008 (Revised March 2014)

Facility Number	*Site File Number*	*Facility Name*	*Associated Programs*	*Listed, Eligible, Individual (I), or Contributing (C) Resource*
	8BR1686	**Launch Complex 39A Historic District**		
J8-1708	8BR1995	Launch Complex 39A	Apollo Program Space Shuttle Program	Listed, I, C Eligible, I, C
J8-1462	8BR2094	High Pressure GH2 Facility	Apollo Program Space Shuttle Program	Listed, Contributing Eligible, Contributing
J8-1502	8BR2095	LOX Facility	Apollo Program Space Shuttle Program	Listed, Contributing Eligible, Contributing
J8-1503	8BR2096	A-1 Operations Support Building	Apollo Program Space Shuttle Program	Listed, Contributing Eligible, Contributing
J8-1614	8BR1614	A-2 Operations Support Building	Apollo Program Space Shuttle Program	Listed, Contributing Eligible, Contributing
J8-1512	8BR2097	Camera Pad No. 1	Apollo Program Space Shuttle Program	Listed, Contributing Eligible, Contributing
J8-1714	8BR2105	Camera Pad No. 2	Apollo Program Space Shuttle Program	Listed, Contributing Eligible, Contributing
J8-1961	8BR2107	Camera Pad No. 3	Apollo Program Space Shuttle Program	Listed, Contributing Eligible, Contributing
J8-1956	8BR2106	Camera Pad No. 4	Apollo Program Space Shuttle Program	Listed, Contributing Eligible, Contributing
J8-1554	8BR2100	Camera Pad No. 6	Apollo Program Space Shuttle Program	Listed, Contributing Eligible, Contributing
J8-1513	8BR2098	LH2 Facility	Apollo Program Space Shuttle Program	Listed, Contributing Eligible, Contributing
J8-1563	8BR2101	Electrical Equipment Building No. 1	Apollo Program Space Shuttle Program	Listed, Contributing Eligible, Contributing
J8-1553	8BR2099	Electrical Equipment Building No. 2	Apollo Program Space Shuttle Program	Listed, Contributing Eligible, Contributing
J8-1811	8BR2110	Electrical Equipment Building No. 3	Space Shuttle Program	Eligible, Contributing
J8-1856	8BR2111	Electrical Equipment Building No.4	Space Shuttle Program	Eligible, Contributing
J8-1703	8BR2103	Slidewire Termination Facility	Apollo Program Space Shuttle Program	Listed, Contributing Eligible, Contributing
J8-1707	8BR2104	Water Chiller Building	Apollo Program Space Shuttle Program	Listed, Contributing Eligible, Contributing
J8-1610	8BR2108	Water Tank	Space Shuttle Program	Eligible, Contributing
J8-1611	8BR2109	Flare Stack	Space Shuttle Program	Eligible, Contributing
J8-1906	8BR2113	Hypergol Fuel Facility	Space Shuttle Program	Eligible, Contributing
J8-1862	8BR2112	Hypergol Oxidizer Facility	Space Shuttle Program	Eligible, Contributing
J8-1564	No BR #	Foam Building	Apollo Program	Listed, Contributing
J8-1565	No BR #	Pump House	Apollo Program	Listed, Contributing

RELEASED - Printed documents may be obsolete; validate prior to use.

APPENDIX B
Historic Properties at Kennedy Space Center
As of November 2008 (Revised March 2014)

Facility Number	*Site File Number*	*Facility Name*	*Associated Programs*	*Listed, Eligible, Individual (I), or Contributing (C) Resource*
	8BR1686	**Launch Complex 39A Historic District (continued)**		
J8-1659	No BR #	Compressed Air Building	Apollo Program	Listed, Contributing
J8-1753	No BR #	Remote Air Intake Building	Apollo Program	Listed, Contributing
J8-1858	No BR #	Azimuth Alignment Station	Apollo Program	Listed, Contributing
	8BR1687	**Launch Complex 39B Historic District**	**Apollo Program Space Shuttle Program**	**Listed, I, C Eligible, I, C**
J7-337	8BR2010	Launch Complex 39B	Apollo Program Space Shuttle Program	Listed, Contributing Eligible, Contributing
J7-132	8BR2114	B-1 Operations Support Building	Apollo Program Space Shuttle Program	Listed, Contributing Eligible, Contributing
J7-243	8BR2122	B-2 Operations Support Building	Apollo Program Space Shuttle Program	Listed, Contributing Eligible, Contributing
J7-140	8BR2115	High Pressure GH2 Facility	Apollo Program Space Shuttle Program	Listed, Contributing Eligible, Contributing
J7-182	8BR2116	LOX Facility	Apollo Program Space Shuttle Program	Listed, Contributing Eligible, Contributing
J7-191	8BR2118	Camera Pad B No. 1	Apollo Program Space Shuttle Program	Listed, Contributing Eligible, Contributing
J7-342	8BR2124	Camera Pad B No. 2	Apollo Program Space Shuttle Program	Listed, Contributing Eligible, Contributing
J7-589	8BR2127	Camera Pad B No. 3	Apollo Program Space Shuttle Program	Listed, Contributing Eligible, Contributing
J7-584	8BR2126	Camera Pad B No. 4	Apollo Program Space Shuttle Program	Listed, Contributing Eligible, Contributing
J7-183	8BR2117	Camera Pad B No. 6	Apollo Program Space Shuttle Program	Listed, Contributing Eligible, Contributing
J7-192	8BR2119	LH2 Facility	Apollo Program Space Shuttle Program	Listed, Contributing Eligible, Contributing
J7-241	8BR2121	Electrical Equipment Building No. 1	Apollo Program Space Shuttle Program	Listed, Contributing Eligible, Contributing
J7-231	8BR2120	Electrical Equipment Building No. 2	Apollo Program Space Shuttle Program	Listed, Contributing Eligible, Contributing
J7-331	8BR2123	Slidewire Termination Facility	Apollo Program Space Shuttle Program	Listed, Contributing Eligible, Contributing
J7-385	8BR2125	Water Chiller Building	Apollo Program Space Shuttle Program	Listed, Contributing Eligible, Contributing
J7-240	8BR2128	Flarestack	Space Shuttle Program	Eligible, Contributing
J7-288	8BR2129	Water Tank	Space Shuttle Program	Eligible, Contributing
J7-242	No BR #	Foam Building	Apollo Program	Listed, Contributing
J7-338	No BR #	Compressed Air Building	Apollo Program	Listed, Contributing

RELEASED - Printed documents may be obsolete; validate prior to use.

APPENDIX B
Historic Properties at Kennedy Space Center
As of November 2008 (Revised March 2014)

Facility Number	*Site File Number*	*Facility Name*	*Associated Programs*	*Listed, Eligible, Individual (I), or Contributing (C) Resource*
		Launch Complex 39B Historic District (continued)		
J7-537	No BR #	Azimuth Alignment Station	Apollo Program	Listed, Contributing
J7-432	No BR #	Remote Air Intake Building	Apollo Program	Listed, Contributing
	8BR1986	**Shuttle Landing Facility Historic District**	Space Shuttle Program	Eligible, I, C
UK-027	8BR1987	Shuttle Runway	Space Shuttle Program	Eligible, I, C
J6-2313	8BR1988	Landing Aids Control Building	Space Shuttle Program	Eligible, I, C
J6-2262	8BR1989	Mate-Demate Device	Space Shuttle Program	Eligible, I, C
	8BR1990	**Orbiter Processing Historic District**		
K6-894	8BR1991	Orbiter Processing Facility High Bay 1 and 2	Space Shuttle Program	Eligible, I, C
K6-696	8BR1992	Orbiter Processing Facility High Bay 3 (includes the Space Shuttle Main Engine Processing Facility	Space Shuttle Program	Eligible, I, C
K6-794	8BR1994	Thermal Protection System Facility	Space Shuttle Program	Eligible, I, C
	8BR1996	**Solid Rocket Booster (SRB) Disassembly and Refurbishment Complex Historic District**		
66250	8BR2001	Hangar AF	Space Shuttle Program	Eligible, Contributing
66251	8BR2002	High Pressure Gas Facility	Space Shuttle Program	Eligible, Contributing
66240	8BR2003	High Pressure Wash Facility	Space Shuttle Program	Eligible, Contributing
66242	8BR2004	First Wash Building	Space Shuttle Program	Eligible, Contributing
66244	8BR2005	SRB Recovery Slip	Space Shuttle Program	Eligible, Contributing
66310	8BR2006	SRB Paint Building	Space Shuttle Program	Eligible, Contributing
66320	8BR2007	Robot Wash Building	Space Shuttle Program	Eligible, Contributing
66249	8BR2008	Thrust Vector Control Deservicing Building	Space Shuttle Program	Eligible, Contributing
66340	8BR2009	Multi-Media Blast Facility	Space Shuttle Program	Eligible, Contributing
	8BR2015	**Hypergol Maintenance and Checkout Area Historic District**		
M7-961	8BR1993	Hypergol Module Processing North	Space Shuttle Program	Eligible, I, C
M7-1061	8BR2000	Hypergol Support Building	Space Shuttle Program	Eligible, Contributing

RELEASED - Printed documents may be obsolete; validate prior to use.

APPENDIX B
Historic Properties at Kennedy Space Center
As of November 2008 (Revised March 2014)

Facility Number	*Site File Number*	*Facility Name*	*Associated Programs*	*Listed, Eligible, Individual (I), or Contributing (C) Resource*
	8BR2015	**Hypergol Maintenance and Checkout Area Historic District (continued)**		
M7-1212	8BR2933	Hypergol Module Processing South	Space Shuttle Program	Eligible, I, C
	8BR2932	**NASA KSC Railroad System Historic District**		
UK-022	8BR2931	Railroad Track	Space Shuttle Program	Eligible, Contributing
H2-1198	8BR2906	Jay Jay Bridge	Space Shuttle Program	Eligible, Contributing
	8BR2923	Locomotive 1	Space Shuttle Program	Eligible, Contributing
	8BR3043	Locomotive 2	Space Shuttle Program	Eligible, Contributing
	8BR3044	Locomotive 3	Space Shuttle Program	Eligible, Contributing
NLAX170	8BR2908	70-Ton Aft Skirt Car	Space Shuttle Program	Eligible, Contributing
NLAX171	8BR3042	70-Ton Aft Skirt Car	Space Shuttle Program	Eligible, Contributing
		NASA-owned Cape Canaveral Industrial Area Historic District*		
1728	8BR3069	Hangar N	Space Shuttle Program	Eligible, Contributing
54925	8BR2190	Little N Storage Building	Space Shuttle Program	Eligible, Contributing
55005	8BR2972	Hangar M Annex	Space Shuttle Program	Eligible, Contributing
60540	8BR2977	Solar Array Test Building	Expendable Launch Vehicle Program	Eligible, Contributing
60650	8BR2975	E&O Building	Project Mercury	Eligible, Contributing
60680	8BR2976	Missile Assembly Building AE	Expendable Launch Vehicle Program	Eligible, I, C
1726	8BR3070	Hangar S	Project Mercury	Eligible, I, C
		*Hangar AF Complex is also contributing to the historic district (9 facilities)	Space Shuttle Program	Eligible, Contributing

RELEASED - Printed documents may be obsolete; validate prior to use.

APPENDIX C
Undertakings that Do Not require Consultation with the SHPO

The listed categories below are determined to have no adverse effects on existing or future listed or eligible historic properties and/or structures. Therefore, upon reviewing any proposed action to a property and/or structure on NASA-KSC, if the action falls into one or more of these categories, NASA-KSC may proceed with their proposed project without public notification or consultation from the SHPO and/or the ACHP.

1. Antiterrorism and Force Protection Measures: Antiterrorism and force protection measures designed and constructed to prevent or mitigate hostile actions, including cyber threats, as well as to increase capacity and protection for access control, provided such construction does not alter or detract from the qualities that contribute to the significance of the historic property and/or structure. Any ground disturbing activities proposed shall comply with Stipulation VI.

2. Building Maintenance and Repair: General maintenance and repair of buildings and facilities, which includes, but is not limited to, painting, siding, roofing, door, ceiling, wall, window, floor covering repair/replacement, elevator repair, filter and light replacement, and repairs to existing equipment. If historic fabric must be replaced, it should be in-kind and match as practicable to the configuration, material, size, detail, and construction of the historic fabric as called for in the *Secretary of the Interior's Standards for Rehabilitation.*

3. Building Removal: Demolition of buildings, structures, or facilities that are either not listed on or eligible in Appendix B or do not contribute to the significance of those historic properties, whether or not they lie within an historic district.

4. Electrical: Maintenance, repair, removal, modification, upgrading, or replacement of plant and building electrical systems (e.g., building conduit, wiring and lighting, emergency lighting, etc.) in all NASA-KSC buildings and structures. Upgrading or additional new electrical lines between or among buildings within historic districts listed or determined eligible on the NRHP under Criteria A, B, or D.

5. Energy Conservation: Energy conservation measures, including installation, replacement, or modifications to the heating, ventilation, and air condition control systems and conversions to alternative fuels, provided that these elements do not detract from the qualities that make the historic property listed or determined eligible.

6. Erosion Control: Erosion control activities, such as gravel or riprap placement on slopes, planting or seeding ground cover, or cleanout of existing drainage ditches.

7. Facility Removal or Replacement: Removal or replacement of existing nonhistoric equipment or facility components where the equipment or component

RELEASED - Printed documents may be obsolete; validate prior to use.

APPENDIX C
Undertakings that Do Not require Consultation with the SHPO (continued)

itself is not a feature which contributes to the historic significance of the historic property(ies) identified in Appendix B.

8. Fencing: Maintenance of existing fencing and installation of a new chain-link or post and rail fencing.

9. Fire Detection and Suppression: Changes to fire detection and suppression systems, including routine upgrades and modifications to fire alarm systems, smoke detectors, and sprinkler systems.

10. Green Building Technologies: Incorporation of green building technologies to existing buildings seeking certification under the U.S. Green Building Council's Leadership in Energy and Environmental Design standards for environmentally sustainable construction, provided such construction does not alter or detract from the qualities that contribute to the significance of the historic property(ies).

11. Health and Safety: Health and safety activities, including cleanup, encapsulation, and removal and disposal of asbestos-containing materials and lead paint from buildings and structures.

12. Hurricane Modifications: Modifications necessary to comply with hurricane codes, provided the changes do not alter or detract from the qualities that contribute to the significance of the historic property(ies).

13. Landscaping: Landscaping, including mowing and trimming of grass, shrubs, or trees and routine vegetation already covered under control activities.

14. Lighting: Changes to interior and exterior lighting systems, including replacement of, or modification to, lighting systems in all buildings and facilities.

15. New Building Construction: New construction within historic districts listed or determined eligible for listing on the NRHP under Criteria A and B, provided such new construction does not directly impact or alter contributing resources as called for in the *Secretary of the Interior's Standards for Rehabilitation.*

16. Parking: Parking lot maintenance and repair of existing lots. Temporary parking or placement of mobile homes, tents, and portable structures on extant parking lots or other surfaces that does not require new ground disturbance.

17. Retrofitting: May include siting, installation, maintenance, repair, removal, or replacement of communications and computer systems, including public address

RELEASED - Printed documents may be obsolete; validate prior to use.

APPENDIX C
Undertakings that Do Not require Consultation with the SHPO (continued)

systems, facsimile systems, microwave and radio systems, fiberoptic cables, and phone systems.

18. Roads: Routine road maintenance and resurfacing where work is confined to previously maintained surfaces, ditches, culverts, and cut and fill slopes where there are no known historic properties or where properties would not be affected because proposed work is clearly within disturbed context. Also included are paving extant roads or parking lots, or placing marl or shell on dirt roads or lots; small-scale road, sidewalk, and parking lot repair; and adding rock fill or gravel to roads where no new ground disturbance will occur.

19. Signage: Placement of signage and public interpretation, including the use of interpretive signs or exhibit structures that do not visually intrude on the historic property (ies).

20. Temporary Facilities: Construction or siting of temporary structures and sheds that does not physically affect historically significant properties or involve new ground disturbance.

21. Transfer of Real Estate: Transfer of ownership or management responsibilities of real property, including those listed or determined eligible in Appendix B, to be managed by another Federal agency with equal responsibility for complying with Sections 106 and 110 of the NHPA.

22. Water Systems: Changes to water systems, including siting, installation, maintenance, repair, removal, and operation of plant water systems that include, but are not limited to, water wells, cooling water systems, potable water systems, storm sewers, waste water treatment systems, plant drainage, and plumbing.

RELEASED - Printed documents may be obsolete; validate prior to use.

APPENDIX D
DEFINITIONS

Adverse Effect: An undertaking is considered to have an adverse effect on a resource when it may diminish the integrity of the resource's location, design, setting, materials, workmanship, feeling, or association. Adverse effects on historic properties may include, but are not limited to, physical destruction, damage, or alteration to all or part of a resource; isolation of the resource from, or alteration of, the character of the resource's setting when that character contributes to the resource's qualification for the National Register; introduction of visual, audible, or atmospheric elements that are out of character with the resource or its setting; neglect of a resource resulting in its deterioration or destruction; and the transfer, lease, or sale of the resource.

Advisory Council on Historic Preservation (ACHP): An independent agency created by Title II of the National Historic Preservation Act (NHPA), 16 U.S.C. Section 470i. The review process established by NHPA Section 106, 16 U.S.C Section 470f, is conducted according to regulations issued by the ACHP, 36 CFR Part 800, as authorized by 16 U.S.C. Section 470s.

Agreement Document: Legal document resulting from Section 106 consultation which obligates the signing parties to fulfill their Section 106 responsibilities by carrying out its terms. Three kinds of agreement documents include Agreement-based Determinations of No Adverse Effect, Memoranda of Agreement, and Programmatic Agreements.

Comment: The findings and recommendations of the ACHP formally provided in writing to the head of the agency under Section 106.

Compatible Material: Material that is in harmony or like in kind.

Consultation: The process of seeking, discussing, and considering the views of other participants, and where feasible, seeking agreement with them regarding matters arising in the Section 106 process. The *Secretary of the Interior's Standards and Guidelines for Federal Agency Preservation Programs* pursuant to the NHPA provide further guidance on consultation.

Contributing Resource: A building, structure, or object that adds to the historic associations or historic engineering or architectural qualities for which a property is significant because either it was present during the period of significance, relates to the documented significance of the property, and posses historic integrity or is capable of yielding important information about the period, or it independently meets the NRHP criteria.

Day: Calendar days.

Effect: Alternation to the characteristics of a historic property qualifying it for listing or eligible on the National Register.

RELEASED - Printed documents may be obsolete; validate prior to use.

APPENDIX D
DEFINITIONS (continued)

Eligible: Properties that meet the National Register criteria as determined by regulations of the Secretary of Interior.

Historic American Building Survey/Historic American Engineering Record (HABS/HAER): Heritage Documentation Program administers HABS, the Federal Government's oldest preservation program, and companion programs HAER, Historic American Landscapes Survey, and Cultural Resources Geographic Information Systems. Documents produced through the programs constitute the Nation's largest archive of historic architectural, engineering, and landscape documentation.

Historic Period: The period after the advent of written history in a geographic region. In Florida, the historic period began in the early 1500s with the arrival of Europeans.

Historic District: A district possessing a significant concentration, linkage, or continuity of sites, buildings, structures, or objects united historically or aesthetically by plan or physical development. All resources within the district are either contributing or non-contributing.

Historic Property: Any prehistoric or historic district, site, building, structure, or object listed or determined eligible for inclusion on the NRHP maintained by the Secretary of the Interior, includes artifacts, records, and remains that are related to and located within such properties. Also includes properties of traditional religious and cultural importance to an Indian tribe or Native Hawaiian organization that meets the National Register criteria.

Historic Setting: A group of facilities and/or structures that follow the same guidelines such as architectural style, functional purpose, or timeline.

Identification: The inventory of all historic properties within a project area of potential effects. This is accomplished through archaeological and historic structures surveys.

Integrity: The authenticity of a historic property's identity, evidenced by the survival of physical characteristics that existed during the resource's historic or prehistoric period. The seven aspects of integrity are location, design, setting, materials, workmanship, feeling, and association.

Memorandum of Agreement (MOA): An agreement document that is prepared when an undertaking will have adverse effects on those characteristics of an historic property that qualify it for the National Register that embodies the ways to reduce, avoid, minimize, or mitigate such effects decided by the consulting parties. A three-party MOA is signed by the Federal agency, the SHPO, and the ACHP; a two-party MOA is when the ACHP has not been involved in the consultation but receives the MOA after the Federal agency and SHPO/THPO has executed it.

RELEASED - Printed documents may be obsolete; validate prior to use.

APPENDIX D
DEFINITIONS (continued)

Mitigation: A remedy or offset to an adverse effect or a change in an historic property's qualifying characteristics that diminish its integrity. Treatment is the act of mitigating those effects, or how one goes about implementing the mitigation measure(s) agreed upon in consultation. Thus, a mitigation plan for the undertaking may contain several treatment plans, one for each property being adversely affected. Data recovery is a common archaeological mitigation measure that, through implementation of a treatment plan, retrieves the important information present within an archaeological site that makes it eligible before the site's integrity is compromised or destroyed. Mitigation can include compilation of documentation such as as-built drawings and site plans, photo documentation (HABS/HAER), development of Web sites, models, public interpretations, reports/pamphlets, written history narrative, data recovery, salvage of artifacts, and/or oral interviews.

Multiple Assets: Multiple copies of assets of a specific property type (e.g., three Mobile Launcher Platforms, two Payload Canisters, two Launch Pads A and B, and two Crawler Transporters) that are ninety-five (95) percent identical.

National Historic Landmark (NHL): A historic property evaluated by the National Park Service and found to have significance at the national level and designated as such by the Secretary of the Interior. NHLs are properties listed in the National Register that have national significance in American history. NHLs are considered to be the most important historic properties in the United States, along with our national parks.

National Historic Preservation Act (NHPA): The National Historic Preservation Act of 1966, as amended (Public Law 89-665; 16 U.S.C. 470 et seq.), is the legislation that created the NRHP, the list of NHLs, the ACHP (giving it authority to issue regulations implementing Section 106) and the posts of State and Tribal Historic Preservation Officers with the intent to preserve historical properties.

National Park Service: The National Park Service (NPS), a bureau in the Department of the Interior, was created by Congress in August 1916. NPS preserves, unimpaired, the natural and cultural resources and values of the national park system for the enjoyment, education, and inspiration of this and future generations. NPS also administers the National Historic Landmarks (NHL) Program.

National Register Criteria: The criteria established by the Secretary of the Interior for evaluating the eligibility of properties for inclusion on the National Register (36 CFR Part 60).

National Register of Historic Places (NRHP): The list of districts, sties, buildings, structures, and objects significant in American history, architecture, archaeology, engineering, or culture. The NRHP is maintained by the Secretary of the Interior under authority of Section 101 (a)(1)(A) of the NHPA, as amended.

RELEASED - Printed documents may be obsolete; validate prior to use.

APPENDIX D
DEFINITIONS (continued)

No Adverse Effect: An undertaking that does not affect those characteristics of an historic property that qualifies it for the NRHP. A determination of No Adverse Effect can be determined in one or two ways: either the nature of the project itself is not harmful or the harmful effects are mitigated through preservation covenants, the retrieval of important information through data recovery, or by following the *Secretary of the Interior's Standards for Rehabilitation and Guidelines for Rehabilitating Historic Buildings*.

Noncontributing Resources: A building, site, structure, or object that does not add to the historic engineering or architectural qualities or historic associations for which a property is significant because it was not present during the period of significance; it does not relate to the documented significance of the property; due to alterations, disturbances, additions, or other changes, it no longer possesses historic integrity or is capable of yielding important information about the period; or it does not independently meet the NRHP criteria.

Programmatic Agreement (PA): A PA is a type of agreement document that records the terms and conditions agreed upon to resolve the potential adverse effects of a Federal agency program, complex undertaking, or other situation in accordance with Subsection 800.14(b) of the ACHP's regulations implementing Section 106.

Rehabilitation: The act or process of returning a property to a state of utility through repair or alteration which makes possible an efficient, contemporary use while preserving those portions or features of the property which are significant to its historical, architectural, and cultural values.

Restoration: The act or process of accurately recovering the form and details of a property and its setting as it appeared at a particular period of time by means of the removal of later work or by the replacement of missing earlier work.

Rural Historic Landscape: A geographic area that historically has been shaped or modified by human activity, occupancy, or intervention and that possesses a significant concentration, linkage, or continuity of areas of land use, vegetation, buildings and structures, roads and waterways, and natural features.

Secretary: The Secretary of the Interior acting through the Director of the National Park Service, except where otherwise specified.

Secretary's Standards and Guidelines for Archaeology and Historic Preservation (48 FR 44716-44742): Technical information about archaeological and historic preservation activities and methods. The Standards and Guidelines are prepared under the authority of Section 101(f), (g), and (h), and Section 110 of the NHPA of 1966, as amended.

RELEASED - Printed documents may be obsolete; validate prior to use.

APPENDIX D
DEFINITIONS (continued)

Section 106: Section 106 of the NHPA requires Federal agencies to take into account the effects of their undertakings on historic properties and afford the ACHP a reasonable opportunity to comment on such undertakings. The Section 106 process seeks to accommodate historic preservation concerns with the needs of Federal undertakings through consultation among the agency official and other parties with an interest in the effects of the undertaking on historic properties, commencing at the early stages of project planning. The goal of consultation is to identify historic properties potentially affected by the undertaking, assess its effects, and seek ways to avoid, minimize, or mitigate any adverse effects on historic properties.

Significant: A prehistoric or historic district, site, building, structure, or object meeting one or more of the Criteria for Evaluation used in considering National Register of historic property eligibility. Significance is achieved through association with events or important persons, distinctive physical characteristics, or the potential to yield important information.

State Historic Preservation Officer (SHPO): The official appointed or designated pursuant to Section 101(b)(1) of the NHPA to administer the historic preservation program or a representative designated to act for the SHPO.

Structure: Those functional constructions made usually for purposes other than creating human shelter and used to distinguish the difference from buildings.

Undertaking: A project, activity, or program, funded in whole or in part under the direct or indirect jurisdiction of a Federal agency, including those carried out by or on behalf of a Federal agency; those carried out with Federal financial assistance; and those requiring a Federal permit, license, or approval. NASA-KSC's operations and oversight of contractor operations are undertakings because they are Federal activities and they have the potential to affect historic properties.

RELEASED - Printed documents may be obsolete; validate prior to use.

EXHIBIT 3-13
MITIGATION PLAN FOR HISTORIC PROPERTIES

RELEASED - Printed documents may be obsolete; validate prior to use.

KENNEDY SPACE CENTER

MITIGATION PLAN
FOR
HISTORIC PROPERTIES

Prepared by:

Barbara Naylor
KSC Historic Preservation Officer
Environmental Management Branch

Prepared November 2008
Updated January 2015

RELEASED - Printed documents may be obsolete; validate prior to use.

TABLE OF CONTENTS

Introduction	Page 3
Purpose	Page 3
Statutory Authorities/Regulations	Page 3
Historic Property Surveys & Results	Page 4
Delisting of Historic Properties	Page 8
Mitigation	Page 8
Consultation	Page 9
Funding to Support HABS/HAER or Survey Efforts	Page 9
Shuttle Transition & Retirement Mitigation Plan	Page 9
International Space Station Mitigation Plan	Page 10
21ST Century/Ground Support Development Office/ Construction of Facilities Mitigation Plan	Page 10
Appendix:	
A – Constellation Ground Operations Program Mitigation Plan	Page 11
B – Shuttle Transition & Retirement Mitigation Plan	Page 13
C – International Space Station Mitigation Plan	Page 14
D – 21st Century/GSDO/CofF Mitigation Plan	Page 14
E – Future Mitigation	Page 17

RELEASED - Printed documents may be obsolete; validate prior to use.

KENNEDY SPACE CENTER
MITIGATION PLAN FOR HISTORIC PROPERTIES

INTRODUCTION

The information below discusses the purpose of the mitigation plan developed, the regulatory authorities and statutes that require mitigation to be conducted when an "*adverse effect*" may occur on a historic property or district, the NASA-owned properties surveyed to date, the survey results, the mitigation planned and completed, the consultation process, and who paid for the survey/mitigation efforts. The plan does not cover archaeological sites.

PURPOSE

The purpose of the plan is to develop a mitigation strategy plan for those historic properties listed and/or eligible for inclusion on the National Register of Historic Places (NRHP) that may be affected by demolition or modification undertakings. KSC recognizes its stewardship responsibility for managing their historic properties. To this end, reflecting the Agency's commitment to the protection of its significant historic properties, KSC's goal is to balance historic preservation objectives with the Agency's missions and mandates and to avoid conflict with the on-going operational requirements of the Agency. Historic Preservation is an integral part of KSC's Environmental Program Management mission.

STATUTORY AUTHORITIES/REGULATIONS

The Statutory Authorities are:

- Advisory Council on Historic Preservation - The Advisory Council on Historic Preservation was established under Section 201 of the National Historic Preservation Act (NHPA) of 1966 and is also known as the "Council." The Council issues regulations to implement Section 106, provides guidance and advice on the application of the procedures, and generally oversees the operation of the Section 106 process. The Council also consults with and comments to Agency officials on individual undertakings and programs that affect historic properties.

- Secretary of the Interior, National Park Service - The National Park Service (NPS), also known as the "Service," manages the listings for historic properties and landmarks and is a bureau within the United States Department of the Interior (DOI). The NPS strives to meet its original goals while filling many other roles as well: guardian of our diverse cultural and recreational resources; environmental advocate; world leader in the parks and preservation community; and pioneer in the drive to protect America's open space.

RELEASED - Printed documents may be obsolete; validate prior to use.

- State Historic Preservation Officer - The State Historic Preservation Officer (SHPO) is the official appointed or designated pursuant to Section 101(b)(1) of the NHPA to administer the Florida Historic Preservation Program or a representative designated to act for the SHPO.

Some of the regulations governing the management and preservation of historic properties are:

- The *National Historic Preservation Act of 1966*, as amended
- Executive Order 13287, *Preserve America*
- Section 106 Implementing Regulations, 36 CFR Part 800, as amended
- Section 106 Compliance Guidelines
- *Balancing Historic Preservation Needs with the Operation of Highly Technical or Scientific Facilities*
- *NPR 8510.1, NASA Cultural Resources Management, dated June 20, 2012*

HISTORIC PROPERTY SURVEYS & RESULTS

Below are summaries of the surveys that were conducted at KSC and CCAFS and the results of those surveys. Contact the KSC Historic Preservation Officer for the most recent listing of historic properties listed and/or eligible for listing on the NRHP.

2013/NASA-owned CCAFS Industrial Area Historic Survey – In May 2013, New South Associates conducted an archaeological survey of NASA-owned facilities at the Cape Canaveral Air Force Station to determine if a historic district exists within the CCAFS Industrial Area. The survey found a potential district consisting of 16 contributing and 3 non-contributing resources within a discontiguous boundary. The properties eligible for listing on the National Register, either individually, or as a contributing resource to the newly found NASA-owned CCAFS Industrial Area Historic District, include Hangar N, Little N Storage Bldg., Hangar M Annex, Solar Array Test Building, E&O Building, Missile Assembly Bldg. AE, Hangar S, Hangar AF, SRB Recovery Slip, TVC Deservicing Blvd, High Pressure Gas Facility, Robot Wash Facility, and the Multi-Media Blast Facility. The properties supported a wide range of programs for NASA (e.g., Mercury, ELV, and Space Shuttle). The FL SHPO concurred with the results on May 3, 2014.

2012/45-50 Year Historic Survey – In April 2012, New South Associates conducted an architectural survey and evaluation for 45 buildings and structures that have reached the 45-50 years of age owned by KSC. The project area encompassed buildings located at KSC and CCAFS. Six (6) eligible resources were found to be listed in the National Register of Historic Places, which includes the Engineering Development Laboratory, Missile Assembly Building AE, Beach House, Banana River Bridge, Indian River Bridge, and the Haulover Canal Bridge. An additional resource, the Barge Terminal Facility is considered a contributing resource to the Vehicle Assembly Building (VAB).

The properties supported a wide range of programs for NASA (e.g., Apollo, ELV, Space Shuttle, and ISS). The FL SHPO concurred with the results on November 18, 2013.

2012/Jay Jay Bridge, Railroad System, and Locomotives Historic Survey – In January 2012, Archaeological Consultants Inc. (ACI) conducted a historical survey and evaluation of 81 assets, which included the Jay Jay Railroad Draw Bridge, the railroad system, the locomotives, and railcars at the KSC on behalf of NASA. The Jay Jay Draw Bridge, NLAX 170 and 171, which are 70-ton flatcars, three Locomotives (#1, #2, and #3), and NASA KSC Railroad Track appear to meet the criteria for listing in the NRHP as contributing resources to the NASA KSC Railroad System Historic District. The railroad system begins with the original planning efforts for the Center itself. The original master plan for the Center depicted a railroad system to deliver construction supplies, and operations and maintenance supplies for the U.S. Manned Space Programs. Although it failed to live up to its promise during the Apollo era, the railroad was used on a regular basis during the SSP as a means of transporting SRMs, an essential component of the Space Shuttle vehicle. Seventy-four (74) resources do not appear to meet the criteria for listing in the NRHP. The FL SHPO concurred with the survey results on January 4, 2013.

2012/Bioastronautics Operations Support Unit (BOSU) Historic Survey – In February 2012, Archaeological Consultants, Inc. conducted a historical survey and evaluation of Facility 49635/Environmental Health/Health Physics Facility, originally called the BOSU. The BOSU was determined individually eligible for listing in the National Register of Historic Places for one of the roles the USAF played in the U.S. Manned Space Program. Its period of significance is considered to be from 1964, when it was designed, through 1972, when the building was transferred to NASA for use as an occupational health clinic. It housed the Launch Site Recovery Command Post for the LSRT, as well as a completely equipped surgical suite. The LSRT was a group of military personnel, specially trained to rescue astronauts in the event of an emergency during the launch sequence. The team would carry the astronauts from the launch pad to the BOSU, where doctors were capable of providing medical treatment to the astronauts within the surgical suite. Although no emergencies ever occurred during a manned spaceflight launch, the BOSU housed a vital service to the U.S. Manned Space Program. In addition, it served as the location where the Apollo 1 astronauts were first taken following the fire within their capsule during a simulation at Launch Complex 34. The FL SHPO concurred with the survey results on July 30, 2012.

2012/Hypergol Module Facility South (HMP South) & Boresight Control Building Historic Survey – In January of 2012, New South Associates conducted a historic survey of HMP South and of the Boresight Control Building. HMP South was part of the Fluid Test Area to test hypergolic fuels and was later used to process the Space Shuttle's forward RCS modules. It was determined individually eligible to the National Register of Historic Places and considered part of the Hypergol Maintenance and Checkout Area Historic District. The Boresight Control Building was determined ineligible at this time. The FL SHPO concurred with the results on March 30, 2012.

2007/Space Shuttle Survey (SSP) – In response to President George W. Bush's announcement in January 2004 that the SSP would end in 2010, KSC proactively completed an historic survey and evaluation of all NASA-owned facilities and properties (real property assets) in the context of the U.S. Space Shuttle Program (1969-2011) in October 2007. The survey was conducted by Archaeological Consultants, Inc.

NASA focused on 112 real property assets identified as potentially significant in the context of the SSP. As a result of research and field survey, 6 previously NRHP-listed historic properties and 20 newly identified assets were considered individually eligible for listing in the NRHP. Two (2) previously listed historic districts originally listed for their exceptional significance in the context of the Apollo Program were also assessed as significant within the context of the SSP. In addition to the individually eligible launch pads, each historic district contains 20 contributing resources, which are not individually eligible. Four (4) new historic districts were identified. In conclusion, of the total 112 assets identified and evaluated at KSC, 76 are NRHP-listed or eligible properties, including 26 individually listed or eligible properties and 50, which are contributing to a historic district, are not considered individually eligible. Thirty-six (36) assets were evaluated as ineligible for listing in the NRHP, either individually or as part of a historic district. The FL SHPO concurred with the survey results on May 27, 2008.

2001/NASA-Owned Properties Located on CCAFS Historic Survey – Using a similar methodology, an historical/architectural survey of NASA-owned facilities located within Cape Canaveral Air Force Station (CCAFS) was also conducted in 2001 by ACI.

Of the 106 properties, which NASA continues to operate at CCAFS, 28 were part of the 1984 National Historic Landmark District and two (2) are considered eligible for the NRHP. The 76 remaining properties were not considered eligible for the NRHP at the time of the 2001 survey. Of the 72 properties with a known date of construction, 51 were built during the period of significance from1955 to the end of the Apollo era in1975, while 21 were built after 1975. Although many of these now serve as storage and fuel processing facilities, several operated historically as missile assembly buildings and laboratories used to mate and test the stages and equipment for missiles and rockets. These facilities include Hangars S, N, L, M, AE, and AF as well as the E&O Building and the Emergency Breathing Equipment Maintenance Building. Although the facilities in the CCAFS Industrial Area do not currently meet NRHP eligibility criteria requiring exceptional significance for a property less than 50 years old, several played a vital role. This survey was never forwarded to the FL SHPO for concurrence.

1996/KSC Historic Facilities Survey – An historical/architectural survey was conducted in 1996 by ACI for the Industrial, Launch Complex 39 (LC-39), Vehicle Assembly Building (VAB), and Shuttle Landing Facility (SLF) areas including NASA-owned facilities located within the LC-39 NRHP site boundaries, plus facilities located outside the boundaries. Included were a variety of facility types, from temporary buildings and trailers to the VAB and Launch Control Center (LCC). All facilities were evaluated in accordance to the eligibility criteria for listing in the NRHP. A reassessment survey was conducted by ACI in 1997 on the original Launch Complex 39 (LC-39) NRHP-listed site for the exceptional national importance within the context of the Apollo Space Program,

RELEASED - Printed documents may be obsolete; validate prior to use.

1961 through 1975. This amendment to the original nomination was directed at identifying those historic properties subject to NASA's Section 106 review and compliance under the NHPA, while, at the same time deleting those properties that do not represent or embody the significant historical values, which make these properties eligible for listing in the NRHP.

The survey resulted in the preparation of a NRHP Multiple Property Documentation Form and an individual nomination for a number of buildings, structures, districts, and objects considered to be of exceptional national importance within the context of the Apollo Program, 1961 through 1975. This amendment was directed to the original nomination in 1973. The boundary of the original LC-39 Site was removed. Instead, each nominated historic property now has a boundary, which encompasses only the footprint of the eligible resource, thus eliminating properties, which are not significant. Of the 322 resources located within the original NRHP site, the reassessment served to reduce the number to 8 individually eligible resources and 34 facilities considered contributing to the NRHP Districts at Launch Pads A and B. The VAB, LCC, Crawlers, Crawlerway and Launch Pads A and B were retained from the original nomination. The Headquarters Building, O&C, Central Instrumentation Facility (CIF) and the Press Site: Clock and Flag Pole were added as a result of this survey. The three Mobile Launcher Platforms (MLP)/Launch Umbilical Towers (LUT) included in the original nomination were no longer considered independently eligible for the NRHP due to a loss of integrity. The Mobile Service Structure (MSS), also included in the original nomination is no longer extant. Thus, the MLPs/LUTs and the MSS were suggested for delisting. The SHPO recommended that a new Multiple Property submission be accepted to supersede the original nomination and this was signed in August 1998. It was further recommended that upon the conclusion of the SSP and each succeeding program, properties would be evaluated and amendments be made to the Multiple Property nomination, as appropriate.

1994/CCAFS Historic Survey – The U.S. Army Construction Engineering Research Laboratory conducted a survey in 1994 on CCAFS and recommended eight (8) sites to be considered eligible for listing on the NRHP under Criteria A and/or C.

The survey performed by the U.S. Army Construction Engineering Research Laboratory recommended that Complexes 1/ 2, 3/4, 17, 21/22, 25, and 31/32 be considered eligible for the NRHP under Criteria A and/or C. Other properties were not considered eligible for the NRHP at that time. Of the NRHP-eligible properties, only two, Launch Silo 31-B (17750) and Launch Silo 32-B (17751), are in NASA ownership.

1984/NHL: Man in Space Landmark Study – A National Historic Landmarks (NHL) Theme Study was completed by the NPS associated with the early American Space Program in 1984 to best identify and illustrate the "Man in Space" theme. These are the sites of critical breakthroughs in overcoming barriers to spaceflight and of significant events leading to the first landing of a Man on the Moon. The theme represented by these sites began in 1915 with the formal beginnings of America's technological base for flight, extends to 1972 with the conclusion of man's successful exploration of the Moon, and includes the unmanned scientific exploration of the Earth, Planets, and Solar System.

RELEASED - Printed documents may be obsolete; validate prior to use.

At the direction of the Secretary of the Interior's Advisory Board, a National Historic Landmark Federal Agency Nomination was prepared for the United States Air Force. The study identified 25 National Historic Landmarks and one (1) nationally significant site listed on the NRHP that best illustrate the "Man in Space" theme. The "Man in Space" sites include wind tunnels, rocket engine and development test facilities, launch complexes, training facilities, spacecraft and hardware test facilities, mission control and tracking centers, and other support facilities throughout the United States. In addition to these 26 sites, the study discusses the 18 installations that played an important role in the early American Space Program and/or have value for interpreting the history of the program to the public. Other space museums and facilities that provide interpretive and educational opportunities related to the exploration of space are also briefly described in this theme. The nomination highlighted the national significance of those principal facilities associated with the manned and unmanned space programs of the United States which included Launch Pads 5, 6, 13, 14, 19, 25, 34, and the original Mission Control Center (MCC); 28 NASA-controlled facilities at CCAFS were included as part of the 1984 National Historic Landmark District.

1973/LC-39 Site Nomination – Mr. George M. Hawkins, Chief of the Documentation and Data Management Branch of KSC requested that Launch Complex (LC) 39 Site be evaluated in May 1973. The LC-39 Site became the first NASA-KSC site to be listed in the NRHP. The Complex was built between November 1962 and October 1968 and evaluated as significant in the areas of architecture, communications, engineering, industry, science, transportation, and space exploration.

The nomination highlighted the national significance of the principal facilities associated with the Apollo Manned Lunar Landing Program. The boundaries of the National Register site encompassed a rectangle measuring approximately 2,833 ha (7,000 ac) in areal extent. Nominated were the VAB, LCC, three LUTs, a MSS, two Missile Crawler Transporter Facilities (Crawlers), the Crawlerway, and Launch Areas A and B, the latter of which included the elevated launch pads, storage tanks, and associated servicing and control equipment. A total of 322 resources were located within the original NRHP Site.

HISTORIC PROPERTIES DELISTED

Both the Launch Umbilical Tower (LUT) and the Mobile Service Structure (MSS) have been delisted. The LUT was delisted (unknown date) prior to its demolition due to the fact that it was determined to be no longer extant. The MSS was demolished shortly after the Apollo Program (unknown date) and was not documented under the Section 106 process.

MITIGATION

Mitigation is required when NASA-KSC determines that an undertaking will have an "adverse effect" to a historic facility, structure, building, object, and/or site that is listed and/or eligible for listing in the NRHP. Examples of "adverse effects" are described in the draft *Programmatic Agreement among NASA-KSC, the Advisory Council on Historic*

Preservation, and the Florida State Historic Preservation Officer Regarding Management of Historic Properties at KSC and under *36 CFR Part 800.5(a)(2)*. Mitigation is usually in the form of Historic American Building Survey/Historic American Engineering Record (HABS/HAER) photo documentation, website development, public interpretation, oral histories, salvage of artifacts, and written historic narrative. Qualified professionals meeting the *Secretary of the Interior's Professional Qualifications Standards* (48 FR 44716, dated September 29, 1983) are required to perform the appropriate level of photo documentation for mitigation. This task will be scheduled by the Environmental Management Branch, Historic Preservation Officer. Photo documentation for a facility usually takes no more than one week to perform and approximately five to six months to complete the entire process.

The early HABS/HAER photo documentation completed by our subcontractor will be forwarded to NASA-KSC Historic Preservation Officer until a Section 106 undertaking is known. When a Section 106 undertaking has been determined then consultation will begin with the SHPO and/or all parties involved. The early photo documentation completed will be part of the mitigation measures proposed by NASA.

CONSULTATION

Consultation is required when NASA-KSC determines that an undertaking will have an "adverse effect" to a historic facility, structure, building, object, and/or site per *36 CFR Part 800.2(c)*. NASA-KSC shall provide the appropriate information and documentation as set out in 36 CFR Part 800.11(d) and (e) to the SHPO, Council, and/or any other parties of interest. Agreement, in the form of a Memorandum of Agreement, needs to be reached with all the parties prior to development of a mitigation plan and prior to start of the project. If agreement is not reached, then NASA-KSC would consult with the Advisory Council. Consultation for a historic facility normally ranges from three (3) to six (6) months, but could take longer depending on agreement with the consulting parties and complexity of the project.

FUNDING TO SUPPORT HABS/HAER OR SURVEY EFFORTS

To support the Agency's vision, many of the historic properties at KSC, which supported the Apollo and/or the Space Shuttle Programs, require modifications,. Funding, to perform early recordation efforts, began with the Constellation Program, who set aside approximately $125K per year for historic preservation. After the cancellation of the Constellation Program, the project paid for the undertaking's mitigation measures agreed upon between NASA KSC and the FL State Historic Preservation Officer. The tables below will describe the activity, year, and who paid for this task.

SHUTTLE TRANSITION AND RETIREMENT MITIGATION PLAN

To support Shuttle Transition and Retirement (T&R) activities, KSC budgeted for provisions to demolish the historic properties listed in Appendix C. NASA was given a bold new vision for its future: to return to the moon and ultimately onto Mars and

RELEASED - Printed documents may be obsolete; validate prior to use.

beyond. To accomplish this new vision, NASA must manage its limited resources and maximize the use of its facilities. Therefore, the Agency has determined that the closure and demolition of abandoned or unused facilities, equipment, and structures at its field centers will be required to reduce operational costs within tight budgetary and security constraints foreseen for future programs. Appendix B is a list of facilities that were documented as part of the T&R process.

INTERNATIONAL SPACE STATION – Appendix C is a list of historic properties that were funded by the International Space Station.

21st CENTURY/GROUND SUPPORT DEVELOPMENT OFFICE (GSDO/CONSTRUCTION OF FACILITEIS (CofF) – Appendix D is a list of historic properties that were funded by the 21st Century Group, Ground Support Development Office, or the Construction of Facilities Group.

RELEASED - Printed documents may be obsolete; validate prior to use.

APPENDIX A
MITIGATION PLAN FOR
CONSTELLATION GROUND OPERATIONS PROGRAM

Facility Name	On Contract	Start of Project	Completion of On-Site Photo Doc	Date Final Doc. Received	Project Completion Date	Comments
FY 2005 Mitigation Activities						
O&C High Bay (Contributing Elements)	X	Mar 2006	Oct 2006	Dec 2006	Aug 2008	CITE Stands and ATM Clean Room photo documentation funded by UB for Lockheed Martin and the State of Florida for process the Orion vehicle; Completed.
FY 2007 Mitigation Activities						
Update CRM Plan	X	Oct 2007	N/A	N/A	June 2009	Completed
Programmatic Agreement for Management of Historic Properties at KSC	X	Oct 2007	N/A	N/A	May 2009	Completed.
LCC and Firing Rooms #2, 3, 4	X	May 2008	May 2008	Jan 2009	June 2009	Received acceptance letters from SHPO 3/26/10 and NPS on 1/9/09; Replaced with the Lightning Mast documentation; Completed.
VAB HB 3	X	May 2008	May 2008	July 2009	October 2009	Received acceptance letters from SHPO 10/02/09 and NPS 8/10/09; Completed.
FY 2008 Mitigation Activities						
VAB (rest of facility: HB2, Low, Low Bay, Transfer Aisle, Exterior/Interior)	X	May 2008	May - Oct 2008	July 2009	October 2009	Received acceptance letters from SHPO 10/2/09 and NPS on 8/10/09; Completed.

APPENDIX A
MITIGATION PLAN FOR
CONSTELLATION GROUND OPERATIONS PROGRAM
(continued)

Facility Name	On Contract	Start of Project	Completion of On-Site Photo Doc	Date Final Doc. Received	Project Completion Date	Comments
FY 2008 Mitigation Activities (continued)						
MLP	X	Dec 2008	Dec 2008	October 2009	January 2010	Received acceptance letters from SHPO 12/9/09 and NPS 1/5/10; Completed.
Crawler Transporter	X	Dec 2008	Dec 2008	October 2009	December 2010	Received acceptance letters from SHPO 12/8/10 and NPS 11/13/09; Completed.
FY 2009 Mitigation Activities						
Pad A	X	September 2009	September - October 2009 and December 2009	August 2010	October 2010	Received acceptance letters from SHPO 10/13/10 and NPS 9/8/10; Completed.
FY 2010 Mitigation Activities						
Rotation/Processing Support Building	X	February 2010	February 2010	August 2011	October 2011	Received acceptance letters from SHPO on 9/21/11 and NPS 10/31/11; Completed.
Thermal Protection Systems Facility	X	March 2010	March 2010	April 2011	August 2011	Received acceptance letters from SHPO 6/7/11 and NPS 8/25/11; Completed.
Canister Rotation Facility	X	April 2010	April 2010	April 2011	August 2011	Received acceptance letters from SHPO 6/7/11 and NPS 8/25/11; Completed.
SLF District (includes MDD, LACB)	X	April 2010	April 2010	April 2011	December 2011	Received acceptance letters from SHPO 6/7/11 and NPS 12/8/11; Completed.

RELEASED - Printed documents may be obsolete; validate prior to use.

APPENDIX A
MITIGATION PLAN FOR
CONSTELLATION GROUND OPERATIONS PROGRAM
(continued)

Facility Name	On Contract	Start of Project	Completion of On-Site Photo Doc	Date Final Doc. Received	Project Completion Date	Comments
FY 2011 Mitigation Activities						
OPF-3/SSME	X	February 2011	February - March 2011	January 2012	April 2012	Received acceptance letter from SHPO 2/23/12; Received acceptance letter from NPS 4/30/12. Completed.

APPENDIX B
MITIGATION PLAN FOR
SHUTTLE TRANSITION & RETIREMENT

Facility Name	On Contract	Start of Project	Completion of On-Site Photo Doc	Date Final Doc. Received	Project Completion Date	Comments
FY 2011 Mitigation Activities						
Press Site: Clock and Flagpole	X	February 2011	February - March 2011	January 2012	April 2012	Received acceptance letters from SHPO 2/23/12 and NPS 4/30/12; Completed.
FY 2012 Mitigation Activities						
HMF Historic District and Survey of HMF South	X	January 2012	January-February 2012 (survey); April 2012 (recordation efforts); May 2012 (retake of 64 shots)	September 2014	October 2014	Survey was completed on February 28, 2012. Received acceptance letters from SHPO 9/26/14 and NPS 10/23/14; Completed.

APPENDIX C
MITIGATION PLAN FOR
INTERNATIONAL SPACE STATION

Facility Name	On Contract	Start of Project	Completion of On-Site Photo Doc	Date Final Doc. Received	Project Completion Date	Comments
FY 2010-11 Mitigation Activities						
SSPF	X	September 2010	September 2010	October 2011	November 2011	Received acceptance letter from SHPO 11/21/11; Received acceptance letter from NPS 11/30/11; Completed.
Payload Canister	X	August 2010	August 2010	June 2011	September 2011	Received acceptance letter from SHPO 9/21/11; Received acceptance letter from NPS 9/28/11; Completed.

APPENDIX D
MITIGATION PLAN FOR
21ST CENTURY, COFF, AND GSDO

Facility Name	On Contract	Start of Project	Completion of On-Site Photo Doc	Date Final Doc. Received	Project Completion Date	Comments
FY 2012 Mitigation Activities						
45-50 Year Historic Survey (GSDO)	X	April 2012	N/A	October 2013	November 2013	SHPO concurred with results on 11/18/13.
Hangar AF Complex (21st Century Funds)	X	October 2011	October 2013	November 2013	February 2014	Received acceptance letters from SHPO 11/18/13 and NPS 2/6/14; Completed.
SRB ARF Manufacturing Building (21st Century Funds)	X	October 2011	October 2011	March 2013	February 2014	Received acceptance letters from SHPO 4/12/13 and NPS 2/5/14; Completed.
Parachute Refurbishment Facility (21st Century Funds)	X	October 2011	October 2011	March 2013	August 2014	Received acceptance letters from SHPO 4/12/13 and NPS 8/15/14; Completed.

APPENDIX D
MITIGATION PLAN FOR
21ST CENTURY, COFF, AND GSDO
(continued)

Facility Name	On Contract	Start of Project	Completion of On-Site Photo Doc	Date Final Doc. Received	Project Completion Date	Comments
FY 2012 Mitigation Activities (continued)						
Crawlerway - West Park Site - East Park Site (21st Century Funds)	X	November 2011	November 2011	September 2012	November 2012	Received acceptance letters from SHPO 10/19/12 and NPS 11/27/12; Completed.
HQS Building (21st Century Funds)	X	March 2012	March 2012	December 2012	January 2013	Received acceptance letters from SHPO 12/13/12 and NPS 1/17/13; Completed.
Jay Jay Bridge (includes Locomotives and R/R System) HAER (GSDO)	X	June 2012	June 2012	March 2013	November 2013	Received acceptance letters from SHPO 5/3/2013 and NPS 11/7/2013; Completed.
BOSU (21st Century Funds)	X	August 2012	August 2012	March 2013	November 2013	Received acceptance letters from SHPO 5/3/13 and NPS 11/7/13; Completed.
O&C (GSDO)	X	May 2012	May 2012	March 2013	November 2013	Received acceptance letters from SHPO 5/3/13 and NPS 11/7/13; Completed.
CIF (21st Century Funds)	X	April 2012	April 2012	January 2013	April 2013	Received acceptance letter from SHPO 2/6/13 and NPS 4/15/13; Completed.

RELEASED - Printed documents may be obsolete; validate prior to use.

APPENDIX D
MITIGATION PLAN FOR
21ST CENTURY, COFF, AND GSDO
(continued)

Facility Name	On Contract	Start of Project	Completion of On-Site Photo Doc.	Date Final Doc. Received	Project Completion Date	Comments
FY 2012 Mitigation Activities (continued)						
VAB Utility Annex (21st Century Funds)	X	September 2012	September 2012	April 2014	August 2013	Received acceptance letter from SHPO 6/6/14 and NPS 8/15/14; Completed.
FY 2013 Mitigation Activities						
EDL (GSDO)	X	January – February 2013	January – February 2013	April 2014	August 2014	Received acceptance letter from SHPO 6/6/14 and NPS 8/15/14; Completed.
3 Bridges/ Barge Terminal Facility (GSDO)	X	January 2013	January – February 2013	May 2014	August 2013	Received acceptance letter from SHPO 6/6/14 and NPS 8/15/14; Completed.
NASA-owned CCAFS Industrial Area Historic Survey (conducted in reference to Hangar S demo) (GSDO)	X	May 2013	May 2013	January 13, 2014	March 2014	SHPO concurred with survey results on 3/3/14; Completed.
Beach House (GSDO)	X	March 2013	March 2013	September 2014	December 2014	Received acceptance letter from SHPO 12/1/14 and NPS 10/22/14; Completed.
Hangar AE (GSDO)	X	March 2013	March 2013	September 2014	December 2014	Received acceptance letter from SHPO 12/1/14 and NPS 10/23/14; Completed.

APPENDIX D
MITIGATION PLAN FOR
21ST CENTURY, COFF, AND GSDO
(continued)

Facility Name	On Contract	Start of Project	Completion of On-Site Photo Doc.	Date Final Doc. Received	Project Completion Date	Comments
FY 2014 Mitigation Activities						
Hangar S (CofF Funds)	X	May 2013	May 2013	January 2014		Submitted to SHPO/NPS on 1/7/14; received SHPO letter on 1/14/14; awaiting for NPS.
E&O Building (GSDO)	X	July 2013	September 2013	October 2014		Submitted to SHPO/NPS on 10/1/14; received SHPO letter on 12/1/14; awaiting for NPS.
Hangar M Annex (CofF Funds)	X	August 2014	August 2014			Waiting on Final documentation.
Solar Array Test Building (Level III) (CofF Funds)	X	August 2014	August 2014			Waiting on Final documentation.

APPENDIX E
FUTURE MITIGATION

Facility Name	On Contract	Start of Project	Completion of On-Site Photo Doc	Date Final Doc. Received	Project Completion Date	Comments
Hangar N & Little N						Awaiting funds from NASA

RELEASED - Printed documents may be obsolete; validate prior to use.

Chapter 4.0 CULTURAL RESOURCES INVENTORY

4.1 INTRODUCTION

This chapter focuses on the inventory of both archaeological sites and historic resources at KSC, current as of March 2014. Following a look at how significant cultural resources are defined, as per the criteria of eligibility for listing in the NRHP (Section 4.2), KSC's archaeological sites are summarized in Section 4.3. Of the 187 sites, approximately 52 were originally recorded in the 1960s by George Long; the remaining sites were identified primarily during a series of KSC-wide predictive model surveys performed during the 1990s. Dozens of sites located on NASA-owned land east of Mosquito Lagoon were recorded by SEAC. The 105 historic properties, listed or determined eligible for listing in the National Register, either individually or as part of a historic district, are identified and described in Section 4.4. These historic buildings, structures, objects, and districts were identified and evaluated during several historic facility surveys that addressed a specific program or all programs.

4.2 WHAT IS A SIGNIFICANT CULTURAL RESOURCE?

The significance of a cultural resource is evaluated in terms of the eligibility criteria for listing in the National Register of Historic Place*s* (36 CFR Part 60.4). The NRHP is an official listing of historically significant buildings, structures, objects, sites, and districts throughout the country that is maintained by the NPS, U.S. Department of the Interior. The National Register program is administered at the state level by the SHPO, with the staff support of the DHR. National Register properties can have significance at the national, state, or local level. Historic properties of exceptional national significance may qualify for designation as NHLs. The **NHL criteria** (36 CFR Part 65.4) are essentially an elaboration of NRHP criteria; all NHLs are automatically listed in the National Register.

4.2.1 National Register Property Types

The NRHP includes five categories of property types, defined as follows:

A **building** is created principally to shelter any form of human activity. At KSC, the NRHP listed and eligible buildings are dedicated to a diversity of functions, including administration (e.g., Headquarters Building) and vehicle processing (e.g., VAB). Buildings eligible for the NRHP "*must include all of their basic structural elements. Parts of buildings, such as interiors, facades, or wings, are not eligible independent of the rest of the existing building. The whole building must be considered, and its significant features must be identified*" (NPS 1997:4).

Structures are constructions built for functional purposes other than creating human shelter (e.g., MLP, Crawler, SLF Runway, KSC bridges, Barge Terminal Facility, and the Railroad System). Like buildings, all of the basic structural elements must still be extant when considering the structure for eligibility.

An **object** is primarily artistic in nature or relatively small in scale and simply constructed. Although it may be movable by nature or design, an object is associated with a specific setting or environment. Objects should be in a setting appropriate to their significant historic use, roles, or character (e.g., Press Site: Clock and Flag Pole).

A **site** is "*the location of a significant event, a prehistoric or historic occupation or activity, or a building or structure, whether standing, ruined, or vanished, where the location itself possesses historic, cultural, or archeological value regardless of the value of any existing structure*" (NPS 1997:5). To date, all the recorded sites at KSC are archaeological.

A **district** is a collection of sites, buildings, structures, or objects "*united historically or aesthetically by plan or physical development*." It derives its importance from being a "unified entity" linked either historically or functionally and must be important for historical, architectural, archaeological, engineering, or cultural values. While a district is usually a single definable geographical area of **contiguous** historic properties, it may also be discontiguous and composed of two or more definable significant areas separated by nonsignificant areas. A **discontiguous** district is most appropriate where:

- *Elements are spatially discrete;*
- *Space between the elements is not related to the significance of the district; and*
- *Visual continuity is not a factor in the significance* (NPS 1997:6).

RELEASED - Printed documents may be obsolete; validate prior to use.

The LC-39A Historic District is an example of a contiguous historic district, which occupies a single geographic area; the Orbiter Processing Facility Historic District is geographically discontiguous.

Within the defined boundaries of a historic district, there will be elements that do and do not represent or embody the characteristics making the property significant. A **contributing** building, structure, or object adds to the historic associations or historic engineering or architectural qualities for which the property is significant because:

- it was present during the period of significance
- relates to the documented significance of the property and possesses historic integrity
- or is capable of yielding important information about the period
- or it independently meets NRHP criteria.

A **noncontributing** building, structure, or object does not add to the historic engineering or architectural qualities or historic associations for which a property is significant because:

- it was not present during the period of significance or does not relate to the documented significance of the property; or
- due to alterations, disturbances, additions, or other changes, it no longer possesses historic integrity or is capable of yielding important information about the period; or
- it does not independently meet the NRHP criteria.

For the purposes of Section 106 compliance, **contributing resources are afforded equal consideration to that of individually listed or eligible properties.** Even where all of the components lack individual distinction, as is the case with the SRB Disassembly and Refurbishment Complex Historic District, the district as a whole must possess integrity. Also, the majority of the components must retain their essential physical features such that they convey both why and when the historic property was significant. Too many alterations or new additions within the historic district may result in a loss of integrity. For example, the Hypergolic Maintenance and Checkout Area Historic District contained three contributing buildings, of which two (HMP North and HMP South) are individually eligible, and the third (Hypergol Support Building) is contributing. With the loss of the district's historic integrity resulting from the demolition of both HMP North and the Hypergol Support Building, the eligibility determination of the historic district was removed. Had the individually eligible HMP North and HMP South been demolished and the contributing Hypergol Support Building survived, with the loss of the historic district's eligibility, the contributing resource would lose its eligibility status.

4.2.2 NRHP Historic Districts versus Multiple Property Listings

A historic district includes properties that are linked historically, thematically, and physically and "exist within a shared, cohesive, and defined geographical area" (URS 2008:2-10). Sometimes, however, historical properties are linked historically, thematically, and/or physically, but not within a defined geographical area. Also, the historic properties may have been important at different times. In such cases, a multiple property approach rather than a historic district designation is an appropriate way to nominate related historic properties. Preparation of a Multiple Property Documentation Form begins with the selection of a theme that relates all the relevant historic properties. For example, properties which derive their significance from their historical associations with the U.S. Manned Space Program, whether at one NASA Center or nationwide, may be united under this historic context.

The Multiple Property Documentation Form serves as the "umbrella document," or "cover" under which individual historic property nominations, as well as historic district nominations are submitted (URS 2008:2-10). One practical advantage of a multiple property nomination is its flexibility in permitting additional contexts and resources to be added as they become eligible.

4.2.3 The National Register Criteria for Evaluation

The National Register Criteria for Evaluation, as described in the National Register Bulletin 15, are listed below. **Criterion A, B, C, and D** are worded in a manner to provide for a wide diversity of resources.

The quality of significance in American history, architecture, archeology, engineering, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association and:

RELEASED - Printed documents may be obsolete; validate prior to use.

A. *That are associated with* ***events*** *that have made a significant contribution to the broad patterns of our history; or*
B. *That are associated with the lives of* ***persons*** *significant in our past; or*
C. *That embody the distinctive* ***characteristics*** *of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or*
D. *That have yielded, or may be likely to yield, information important in prehistory or history.*

The National Register criteria are subject to very broad interpretation and were purposefully designed to allow the development of specific guidelines on a local basis. Accordingly, the following criteria for evaluating the significance of archaeological sites and historic resources in Florida were prepared by Louis D. Tesar (1987, 1990), former Administrator of the Historic Preservation Compliance Review Section of the DHR. These criteria were applied in the evaluation of archaeological sites located within KSC. According to Tesar, an archaeological or historic site will be considered significant if:

1. *It has already yielded important data and can be expected to yield additional data.*
2. *It is in good condition and can be considered to be among the best known examples of the identified type of site known for the historic context in which it occurs.*
3. *It is atypical or rare and thus considered to contain data not represented at other sites.*
4. *It is located such that it represents a good opportunity for interpretation and public display.*
5. *It is associated with other sites such that as a group or district they are:*
   a. *representative of sites relating to socio-political, religious, subsistence, settlement, etc., activities of a historic context.*
   b. *a typical example of such groupings but in a good or excellent state of preservation.*
   c. *a rare or exceptional example of such site groupings.*
   d. *located such that they represent a good opportunity for interpretation and public display.*
   e. *Offer an opportunity to yield data important to understanding the area's history or prehistory.*

A site will NOT be considered significant if it is extensively damaged or altered and/or is so similar to sites already studied that it is unlikely to contain new information. The exception would be a site associated with a famous historical event or person (Tesar 1987: 17-18).

4.2.4 Criteria Considerations

Some types of cultural resources are not considered eligible for the National Register unless they meet special considerations. However, they must first meet the regular eligibility requirements under Criterion A, B, C, and/or D. Ordinarily cemeteries, birth-places, or graves of historical figures, properties owned by religious institutions or used for religious purposes, structures that have been moved from their original locations, reconstructed historic buildings, properties primarily commemorative in nature, and properties that have achieved significance within the past **50 years** shall not be considered eligible for the National Register. However, such properties will qualify if they are integral parts of a district that meet the criteria or fall within the following categories:

A. A religious property deriving primary significance from architectural or artistic distinction or historical importance; or
B. A building or structure removed from its original location, but which is significant primarily for architectural value, or which is the surviving structure most importantly associated with a historic person or event; or
C. A birthplace or grave of a historical figure of outstanding importance if there is no appropriate site or building directly associated with his productive life; or
D. A cemetery which derives its primary significance from graves of persons of transcendent importance, from age, from distinctive design features, or from association with historic events; or
E. A reconstructed building when accurately executed in a suitable environment and presented in a dignified manner as part of a restoration master plan and when no other building or structure with the same association has survived; or
F. A property primarily commemorative in intent if design, age, tradition, or symbolic value has invested it with its own exceptional significance; or
G. A property achieving significance within the past 50 years if it is of exceptional importance.

RELEASED - Printed documents may be obsolete; validate prior to use.

In the case of highly technical and scientific facilities, the **50 year old criterion is not a fast and hard rule** (ACHP 1995:5). Oftentimes NASA facilities will be evaluated long before they are close to fifty years of age, because they may have achieved significance in the recent past. Similarly, there is more latitude allowed with regard to the aspect of integrity, as discussed in the following section.

4.2.5 Integrity

To be listed in the NRHP, **a cultural resource must meet Criterion A, B, C, and/or D and must possess integrity**. According to the "Guidelines for Applying the National Register Criteria for Evaluation," **integrity** is "*the authenticity of a property's historic identity, evidenced by the survival of physical characteristics that existed during the property's historic or prehistoric period. If a property retains the physical characteristics it possessed in the past then it has the capacity to convey association with historical patterns or persons, architectural or engineering design and technology, or information about a culture or people.*" The National Register criteria specify that integrity is a quality that applies to historic and precontact resources in seven ways: **location, design, setting, materials, workmanship, feeling, and association**. These aspects, or qualities of integrity, are defined below.

Location: *The place where the historic property was constructed or the place where the historic event occurred.*

Design: *The combination of elements that create the form, plan, space, structure, and style of a property.*

Setting: *The physical environment of a historic property.*

Materials: *The physical elements that were combined or deposited during a particular period of time and in a particular pattern or configuration to form a historic property.*

Workmanship: *The physical evidence of the crafts of a particular culture or people during any given period in history or prehistory.*

Feeling: *A property's expression of the aesthetic or historic sense of a particular period of time.*

Association: *The direct link between an important historic event or person and a historic property.*

Analysis of integrity should be based on careful research in terms of both documentation of the property's history and physical inspection of the property. For properties important for their information potential, such as most archaeological sites, integrity depends on the presence of those parts of the site, which contain the important data and which survive in a condition capable of yielding important information. Comparative information about similar sites that have survived should be considered during the evaluation of integrity. For example, a partially disturbed precontact site, which nevertheless retains some information on the form and function of bone tools, may be eligible if it can be shown that the information contained in that site is important, because bone preservation is almost unknown in the region.

A historic building or structure important for its expression of a particular architectural style must have retained most of the physical features that compose that style to be eligible. For example, while it may have lost some detailing or a limited amount of historic materials, the property must retain the majority of the features that are essential to illustrate the style in terms such as massing, spatial relationships, proportion, pattern of windows and doors, texture of materials and ornamentation, etc.

For scientific and technical resources with historic value, given the nature of the scientific process, few facilities will remain completely unaltered for any long period of time (ACHP 1995:5). For example, over time, many of the active NASA launch complexes have been modified to support new generations of rockets. Although LC-39 has undergone major modification to launch the Shuttle orbiters and Saturn rockets, it is still designed to function as a launch pad and retains its integrity of association. In the case of most **highly technical and scientific facilities**, "there shall be continuity in function, and thus in integrity of design and materials, and there may always be integrity of association" (ACHP 1991:33). Where properties have undergone change through time, they must retain "the essential physical features that enable it to convey its historic integrity. The essential physical features are those that define both *why* a property is significant and *when* it was significant" (NPS 1997:46). Although some historic buildings are significant for the specialized equipment or other character-defining features they contain, only the entire building, not part of the building, is considered eligible.

RELEASED - Printed documents may be obsolete; validate prior to use.

4.2.6 Evaluation of Significance

Usually, **archaeological sites** are evaluated as eligible or potentially eligible for National Register listing under Criterion D; that is, the sites are considered to have the ability to yield information important in prehistory or history. Criteria A and B may also apply for individual sites. For example, the archaeological remains of a historic fort may be considered significant under both Criteria A and D if associated with a significant event (e.g., the Second Seminole War) and if it retains research potential. Criterion C may be considered when an archaeological site (or association of sites) embodies the distinct characteristics of a type, period, or method of construction. This criterion is especially applicable if similar examples of the type are rare or poorly preserved. For example, the rarity of a Paleoindian base camp that possesses good contextual integrity would qualify the resource as a good candidate for National Register listing as per Criterion C.

The significance of **historic buildings, structures, objects, and districts** is usually evaluated under Criterion A (association with historic events); Criterion B (association with important persons); or Criterion C (distinctive design or distinguishing characteristics as a whole). Often, more than one criterion will apply to historic properties, including both individually eligible properties and historic districts. For example, the VAB is distinguished for both its association with the Apollo and Space Shuttle Programs in the area of Space Exploration (Criterion A), as well as in the area of Engineering (Criterion C).

In any evaluation of eligibility, it is critical that the following items are addressed and justified:

- boundaries
- significance and the applicable National Register criteria
- contributing and noncontributing resources when the historic property contains more than one historic feature, or when there is a historic district.

4.2.7 Boundaries

The determination of boundaries is a critical consideration. **National Register Bulletin 16** (NPS 1991b) provides the following guidance:

Carefully select boundaries to encompass, but not exceed, the full extent of the significant resources making up the property. The area should be large enough to include all the features of the property, but should not include buffer zones or acreage not directly contributing to the significance of the property.

In general, the boundaries should be selected based upon historical significance and remaining integrity. In the case of most historic facilities at KSC, which are listed or determined eligible for listing in the NRHP, the historic property boundary includes the footprint of the building or structure plus a buffer of approximately 10 feet.

4.3 ARCHAEOLOGICAL SITES

At the close of fiscal year (FY) 1987, **43** archaeological sites located within KSC were recorded in the FMSF. None of these sites had been evaluated sufficiently in terms of its NRHP eligibility. In December 1996, following several seasons of KSC-wide predictive model survey, the number of discovered archaeological resources (located west of Mosquito Lagoon) more than doubled and the NRHP eligibility of most of these previously and newly recorded sites had been assessed to the extent possible. Since this time, **144 new sites** have been added to the database. The KSC archaeological site inventory now includes the sites located east of Mosquito Lagoon, recorded by SEAC. Summary information for the **187 archaeological sites** located within KSC, current as of January 2014, and exclusive of the **one archaeological district, 8VO2569** (comprised of sites 8VO130, -131, and -213), is provided in **Appendix D**. The Kings Road/New Smyrna to Haulover Canal, a historic road recorded in the FMSF as Resource Group **8BR2230** and **8VO8880**, is counted as a single site. Site **8BR186** is now recorded as **8BR1676**. As a result, **8BR186**, deleted from the FMSF, is no longer included in the total count of KSC archaeological sites.

Historic period archaeological sites representing the settlement and use of the area between the 16th and early 20th centuries are presently underrepresented in the archaeological database. Although observed during the predictive model survey, historic sites such as late 19th/early 20th century homesteads and fish camps were not recorded. In 2008, development of a historic context covering the past 200+ years of settlement within today's KSC resulted in the

RELEASED - Printed documents may be obsolete; validate prior to use.

identification of **122** potential historic period site areas, or ZAPs (ACI 2009). To date, these locations have not been subjected to systematic archaeological field survey. Twenty historic features, listed in Section 5.3.1, were recommended for a Phase I archaeological survey. Once completed, the results of this work have the potential to substantially increase the total number of recorded archaeological sites.

4.3.1 Site Types

The 187 known sites contain a total of 219 identified temporal/cultural components. Twenty-seven of the 187 sites have more than one temporal/cultural component (e.g., burial mound and shell midden). The site components are classified into 10 types: artifact scatters, shell middens, historic refuse, burial mounds, middens, single artifact occurrences, historic, historic cemeteries, lithic scatters, and unknown (**Table 4-1**).

Table 4-1. Tabulation of Archaeological Site Type Components.

Component Type	No.	%
Artifact scatters	41	18.8
Shell middens	97	44.7
Historic refuse	21	9.2
Burial mounds	13	6.0
Middens	12	5.5
Single artifact occurrences	11	5.1
Historic	12	5.5
Historic cemeteries	5	2.3
Lithic scatters	2	0.9
Unknown	5	2.3
Total	219	100.0

Artifact Scatters (AS): The second most recorded site type is the artifact scatter, represented at 41 sites, and accounting for approximately 18.8% of the total site components. Artifact scatters are generally characterized by a low density distribution of aboriginal pottery vessel fragments (sherds) and may also include chipped stone tools, the debris from stone tool manufacture and/or modification (waste flakes, lithic debitage), shell tools, shell food remains, and/or animal bone. At KSC, most artifact scatter sites are located along sandy ridges proximate to a fresh water source such as a creek, swamp, or slough. These resources are generally visible as small, discrete surface scatters of cultural materials. Many have been recorded in areas disturbed by prior agricultural activity.

Shell Middens (SM): This type of aboriginal site occurs with the greatest frequency. Ninety-seven shell middens representing 44.7% of the known site type components have been recorded. These resources are usually characterized by shellfish food remains in a matrix of dark, organically-enriched soil in association with aboriginal pottery, animal bone, shell tools, and other cultural materials. Typical shellfish species include oyster (*Crassostrea virginica*), hardshell clam (*Mercenaria sp*.), crowned conch (*Melongena corona*), and left-handed whelk (*Busycon sp*.). Most of the shell middens recorded within KSC are located along the shoreline of Mosquito Lagoon. They are usually marked by a native vegetative cover of live oaks, cabbage palms, and cedars. The results of archaeological testing at many of these sites indicate deep deposits, in some cases extending below the present water table.

Historic Refuse: Twenty-one historic refuse sites are recorded within KSC, representing 9.2% of the known site components. Most of these sites mark the locations of former home sites and are evidenced by historic period ceramic and glass artifacts, as well as building debris.

Burial Mounds (BM): Thirteen burial mounds have been recorded within KSC, representing 6.0% of the known site type components. These above-ground sites range from small, circular features of low relief (1 m [3 ft]), to large sand tumuli measuring more than 10 m (33 ft) in height. Some burial mounds are recorded in pairs; others have associated living areas characterized by shell middens or "shell fields." The recorded burial mound sites are generally located proximate to either Mosquito Lagoon or the Indian River. Where not impacted by modern land-altering activities, they are marked by oak/cabbage palm hammock vegetation. With the exception of the two Ross Hammock burial mounds, little is known about the contents and temporal/cultural affiliations of these sites. Burial mounds can be expected to contain the remains of multiple individual interments, usually associated with grave goods including ceramics and other cultural materials.

Middens (MID): Twelve middens representing 5.5% of the known site type components are recorded within KSC. Unlike the above-ground shell middens, these sites, often referred to as "black earth middens," are characterized by buried cultural deposits of shellfish food remains, shell tools, faunal remains, ceramics, and other cultural materials in a matrix of organically-enriched, dark soil. These sites

RELEASED - Printed documents may be obsolete; validate prior to use.

are not as rich and dense as the shell middens. Most of these sites are located on well-drained, low ridges inland from the shores of Mosquito Lagoon or the Indian River, as well as proximate to tributary creeks.

Single Artifacts (SA): Eleven single artifact sites are recorded within KSC. These represent 5.1% of the known site type components. Typically, this site type is represented by one piece of aboriginal pottery, or, more atypically, a single lithic artifact. They have been found in the droughty sandhills areas, as well as on low ridges proximate to a fresh water source.

***Historic*:** Twelve miscellaneous historic period archaeological sites are recorded within KSC, representing 5.5% of the known site type components. Most of these sites actually represent features of much larger historic properties or landscapes, such as farmsteads, communities, industrial sites, and transportation networks. These include a fort, two canals, a saltworks, a homestead/grove, sugar mill ruins, a historic road, and a school site. These are found in all portions of KSC.

Historic Cemeteries: Five historic cemeteries are recorded within KSC, representing 2.3% of the known site type components.

Lithic Scatters (LS): Only two lithic scatter sites are recorded within KSC, representing 0.9% of the known site type components. The relative scarcity of this site type is undoubtedly associated with the absence of locally available stone suitable for tool manufacture.

Each of the recorded lithic scatter sites was evidenced by a small quantity of chipped stone debris (debitage) resulting from the manufacture and/or modification of tools. Given the small sample size, typical environmental associations for this site type cannot be determined at this time.

Unknown (UNK): Five recorded sites are of unknown type. Included in this category are two "villages" of unverified location, recorded based on a 16th century historical account (Mexia). The FMSF now lists these two sites as "noncultural." The other three unknown site types are also resources of unverified location.

Temporal/Cultural Affiliations: According to the information contained in the FMSF (see **Appendix D**), of the total 187 recorded archaeological sites, all but 42 have identified temporal components. Thirty of the sites have multiple components. In many cases, the recorded affiliation is generic (e.g., prehistoric, 19th century). The identified precontact and historic periods and their frequency of occurrence are provided in Table 4-2.

Table 4-2. Distribution of Archaeological Sites by Temporal/Cultural Affiliation.

Period	No. of Site Components
Prehistoric, unspecified	13
Archaic	5
Orange	9
Transitional	2
St. Johns, unspecified	79
St. Johns I	25
St. Johns II	14
First Spanish	4
British	4
Second Spanish	2
Spanish, unspecified	1
Seminole	1
18th century	1
19th century	4
20th century	8
19th and 20th century	16
Total	188

Given the limited amount of archaeological site testing, the reliability of these temporal/cultural affiliations is questionable for at least 50% of the recorded sites. In general, the period(s) of site occupation for most recorded resources is/are poorly understood, and sites dating to the earliest periods of aboriginal settlement are underrepresented and/or relatively uncommon.

4.3.2 Archaeological Site Evaluations

The KSC-wide Archaeological Survey (ACI 1990, 1991, 1992a, 1992b, 1996) included the evaluation of all known and newly recorded archaeological sites in accordance with the criteria of eligibility for listing in the NRHP, as well as the criteria presented by Tesar (1987). For some sites that could neither be relocated nor sufficiently tested during this project, the prior evaluations of other professional archaeologists (i.e., Brewer 1991a, 1991b, 1992; Ehrenhard 1976; Griffin and Miller 1978; Horvath 1992) were used, as well as more recent investigations (e.g., Penders 2008; Schwadron 2008).

RELEASED - Printed documents may be obsolete; validate prior to use.

All recorded archaeological sites within KSC were classified into one of five evaluation categories:

A. **National Register Listed** - Site is listed in the National Register.

B. **National Register Eligible** - Site was determined eligible by the SHPO, or was assessed as significant by the recorder, based on existing information, and thus, is considered eligible for listing in the National Register.

C. **Potentially Significant** - Site appears potentially significant, but additional Phase I shovel testing or Phase II test excavation may be needed before a final determination can be made.

D. **Not Determined** - Insufficient information currently exists to make an informed assessment of significance.

E. **Not Significant/Not Eligible** - Site was determined ineligible by the SHPO, or is considered not regionally significant, because of limited data potential or site destruction.

The evaluation category for each recorded KSC archaeological site is included in **Appendix D**. A summary of archaeological site evaluations is provided in **Table 4-3**. The sites in Category A and B are described below; those in Categories C, D, and E are broadly characterized, as a group.

Table 4-3. Distribution of Archaeological Sites by Evaluation Category.

Category	No.	%
A: National Register Listed	4	2.2
B: National Register Eligible	25	13.5
C: Potentially Significant	22	11.9
D: Not Determined	74	39.5
E: Not Significant/Not Eligible	62	33.0
Total	**187**	**100**

National Register Listed Sites (Category A): Only **four** recorded sites are listed in the National Register:

8BR188 Old Haulover Canal
8VO130 Ross Hammock Midden
8VO131 Ross Hammock Indian Mounds
8VO213 Ross Hammock Salt Rendering Plant

In addition to their individual listing, **8VO130, -131**, and **-213** also are contributing to the Ross Hammock Archaeological District (**VO2569**). This historic district is not included in the site evaluation category tabulation (Table 4-3).

The **Old Haulover Canal (8BR188)**, constructed in 1854 to link the Indian River with Mosquito Lagoon, originally measured approximately 549 m (1,800 ft) long, 3.0 to 4.3 m (9.8 to 14.1 ft) wide, and .9 m (3.0 ft) deep. It was built by slaves owned by a local citrus farmer for a total cost of $5,000. By 1869, portions of the coquina rock had fallen in "and it was with difficulty that even small boats could be taken through" (Maynard 1929 in Griffin and Miller 1978:110-111). The canal served for 30 years before the new Haulover Canal was constructed 1.4 km (.9 mi) to the north. 8BR188 was listed in the NRHP in December 1978. Noted to be in a deteriorated and altered condition, this historic property was nevertheless significant, because it represents the only extant canal of its type on the east coast of Florida. Today, the portion of the old canal situated west of SR-3 is still extant; east of the road the canal has been dredged. The site is located outside the KSC operational area.

The Ross Hammock Midden (8VO130) (Figure 4-1), Burial Mounds (8VO131) and Confederate Salt Works (8VO213) comprise the **Ross Hammock Archaeological District (8VO2569),** which contains two very large sand burial mounds and an extensive shell midden village area. As the result of excavations in the 1960s (Bullen et al. 1967), the mounds and midden were assigned to the St. Johns I period. The salt works were supposedly used between 1861 and 1865 during the **American Civil War**. The three individual sites, as well as the district, were each listed in the NRHP in 1981. The basic integrity of these sites remains good. All three sites are located outside the KSC operational area.

RELEASED - Printed documents may be obsolete; validate prior to use.

Figure 4-1. *Remains of historic structure on the midden at Ross Hammock.*

In August 2008, SEAC archaeologist Dr. Margo Schwadron conducted limited archaeological survey at Ross Hammock. As a result, the previously interpreted Confederate Salt Works (8VO213) were redefined as the probable ruins of John Ross' first settlement, dating to around 1763 (Schwadron 2008). In addition, a potential slave village area and a possible blacksmith work area, probably dating to the 18th century, were identified. This complex is believed to be part of the Elliot Plantation Site. Terrestrial laser scanning (TLS) was conducted at the Elliot Sugar Mill by University of South Florida (USF) Alliance for Integrated Spatial Technologies (Collins and Doering, 2010). The resulting report documents the use of TLS, development of a GIS geodatabase, site documentation, and stabilization considerations.

National Register Eligible Sites (Category B): Twenty-five sites were either determined eligible by the SHPO or are considered NRHP eligible. Half of these resources are multi-component, with a total of 38 components (by type) represented. The components include six aboriginal burial mounds (**8BR77, 8BR151, 8BR1673, 8VO129, 8VO148, and 8VO8884**); 11 shell middens (**8BR77, 8BR78, 8BR139, 8BR143, 8BR145, 8BR155, 8BR205, 8BR1632, 8BR1674, 8VO129, and 8VO6786**); seven artifact scatters (**8BR151, 8BR206, 8BR774, 8BR913, 8BR1630, 8BR1633, and 8VO8884**); and five middens (**8BR170, 8BR914, 8BR1622, 8BR1633, and 8BR1673**). The historic period components include six areas of historic refuse (**8BR78, 8BR143, 8BR170, 8BR205, 8BR206, and 8VO6786**), and three miscellaneous historic components including a historic grove (**8BR78**), Seminole War fort (**8BR175**), and sugar mill ruins (**8VO160**). All are considered to represent the best examples of their type for KSC and vicinity. None of these sites is situated within an operational area.

Among the NRHP-eligible sites is the **Opposite Futch Cove Site (8BR170),** which contains both a St. Johns period midden component, as well as a late 19th/early 20th century historic refuse component. The site is situated in the VIP Viewing Area, directly south of the Apollo/Saturn V Center. In the late 1980s, prior to development of this facility, **8BR170** was the focus of **Phase II** evaluative testing and **Phase III** mitigative excavation (Ste. Claire and Johnson 1988; Johnson 1992).

In August 2008, SEAC archaeologist Dr. Margo Schwadron conducted limited archaeological survey of the **Sugar Mill Ruins Site (8VO160)**. This site was found to have several significant structures, including "an animal-driven mill; a double oven; a distillery for rum manufacturing; and the sugar boiling factory" (Schwadron 2008). Artifacts collected date the site to 1750s-1780s. The remains of an overseer's house, as well as a potential slave village area, were discovered. There is an extensive network of slave-dug canals or ditches at the Sugar Mill Ruins Site. This complex, like that at Ross Hammock, is believed to be part of the Elliot Plantation Site. A National Register nomination is recommended for the Elliot Plantation Site and a National Historic Landmark nomination should be considered (Schwadron 2013).

Figure 4-2. *Sugar mill remains at 8VO160.*

RELEASED - Printed documents may be obsolete; validate prior to use.

Figure 4-3. *Slave-dug ditches at 8VO160.*

Potentially Significant (Category C): **Twenty-two** sites appear to be potentially significant, and thus, may be eligible for National Register listing. However, more archaeological information is needed before a final determination can be made. Four of the sites are multi-component, 18 are single component, and one is unknown. The total 29 components include 16 shell middens (**8BR909, 8BR1670, 8BR1675, 8BR1680, 8BR2675, 8BR2678, 8VO149, 8VO151, 8VO8883, 8VO8934, 8VO8935, 8VO8943, 8VO8944, 8VO8951, 8VO9281, and 8VO9283**), four artifact scatters (**8BR1620, 8VO151, 8VO2599, and 8VO8883**), three middens (**8BR1619, 8BR1672, and 8VO2599**), two areas of historic refuse (**8BR1670 and 8VO2599**), and four miscellaneous historic components, including a road (**8BR2230**), a canal (**8BR2258**), a coast guard station (**8VO2599**), and a 20th century remains (**8VO8883**), plus one of unknown type (**8BR141**). All of these sites are located in non-operational areas of KSC.

Not Determined (Category D): The significance of **74** sites has not been determined due to an absence of available data. These resources could not be sufficiently evaluated, because either (a) their locations are recorded as "unknown," or (b) efforts to relocate them at their recorded coordinates yielded negative results. Many of these sites, visited and examined more than 25 years ago, are recorded primarily based on surface collections. Others, such as those situated along mosquito control dikes around Mosquito Lagoon, were visited recently, but subjected to only limited testing. Further archaeological work will be necessary to determine site limits, contextual integrity, and significance.

Seven of the sites are multi-component, 59 are single component, and four are unknown. The 75 total identified components include 53 shell middens, five artifact scatters, four burial mounds, two middens, five areas of historic refuse, four miscellaneous historic components, one cemetery, and one single artifact (See **Appendix D**).

These sites contain 19 components: four burial mounds (**8BR62, 8BR142, 8BR150, 8BR156**), one historic cemetery (**8BR191**), six shell middens (**8BR144, 8BR147, 8BR148, 8BR149, 8BR160, and 8BR1665**), two "villages" (now classified as "noncultural" in the FMSF; **8BR60, 8BR61**), one midden (**8BR62**), the remains of a historic ship or fort (**8BR84**), and two of unknown type (**8BR159, 8BR161**).

Not Significant/Not Eligible (Category E): **Sixty-two** sites have been evaluated as not eligible for NRHP listing based on existing information.

Three of the sites are multi-component and 58 are single component. The total 65 components include 15 shell middens, 25 artifact scatters, two middens, two lithic scatters, eight areas of historic refuse, four cemeteries, and 10 single artifact sites (See **Appendix D**).

4.4 SIGNIFICANT HISTORIC RESOURCES

As described in Chapter 3, CRM Accomplishments, previous historic facilities surveys of NASA-owned assets at KSC and CCAFS resulted in the identification of a number of historic buildings, structures, objects, and districts, which are listed or eligible for listing in the NRHP in the context of the Project Mercury, Apollo, Space Shuttle, Expendable Launch Vehicle (ELV), and ISS Programs. A table summarizing relevant information for these historic properties is contained in **Appendix E**. Excluded from the list are the NASA-owned NHLs located within the CCAFS Historic District.

As of January 2014, a total **105** historic properties have been identified within KSC, including **eight** historic districts, **35** individually listed or eligible properties, and **70** resources that are contributing to a historic district, but not individually eligible. The total count of individually eligible properties includes a few multiple resources, specifically, two Crawler Transporters, three Mobile Launcher Platforms, and two Payload Canisters. Descriptions and summary statements of significance for the 39 individually eligible properties (including 21 buildings, 17 structures, and one object), as well as the eight historic districts, are contained in Sections 4.4.1 and 4.4.2, respectively.

RELEASED - Printed documents may be obsolete; validate prior to use.

4.4.1 Individually Listed and Eligible Historic Properties

Of the **39** individually listed and eligible historic properties, 4 are significant only in the context of the Apollo Program: the CIF, the O&C Building, the Environmental Health/Health Physics Facility (Bioastronautics Operations Support Unit [BOSU]), and the Engineering Development Lab. The BOSU was demolished in 2013. Nine other properties are of exceptional importance in the contexts of both the Apollo and Space Shuttle Programs: the VAB, LCC, Crawler Transporters (2), Crawlerway, Press Site: Clock and Flag Pole, LC-39 Pad A and B, Headquarters Building, and Beach House. Twenty historic properties, listed below, are eligible only in the context of the Space Shuttle Program. One property is significant in the context of the ELV Program, the Missile Assembly Building AE. Hangar S is significant in the Project Mercury context and the SSPF is eligible in the context of the ISS Program. Three KSC bridges are eligible in three contexts: Apollo, Space Shuttle, and ISS Programs. Both contributing and noncontributing resources for each program are provided in **Appendix E**.

Apollo context only

- Central Instrumentation Facility (**8BR1692**)
- Neil Armstrong Operations and Checkout Building (**8BR1693**)
- Environmental Health/Health Physics Facility (Bioastronautics Operations Support Unit) (**8BR2905**)
- Engineering Development Lab (**8BR2969**)

Apollo and Space Shuttle context

- Vehicle Assembly Building (**8BR1684**)
- Launch Control Center (**8BR1685**)
- Missile Crawler Transporter Facilities (also known as Crawler Transporters) (2) (**8BR1688**)
- Crawlerway (**8BR1689**)
- Press Site: Clock and Flag Pole (**8BR1690**)
- Headquarters Building (**8BR1691**)
- LC 39: Pad A (**8BR1995**)
- LC 39: Pad B (**8BR2010**)
- Beach House (**8BR2990**)

Space Shuttle context only

- Shuttle Landing Facility (Runway) (**8BR1987**)
- Landing Aids Control Building (**8BR1988**)
- Mate-Demate Device (**8BR1989**)
- Orbiter Processing Facility (**8BR1991**)
- Orbiter Processing Facility High Bay 3/Space Shuttle Main Engine Processing Facility (SSMEPF) (**8BR1992**)
- Hypergol Module Processing North (**8BR1993**)
- Thermal Protection System Facility (**8BR1994**)
- Rotation/Processing Building (**8BR1997**)
- Manufacturing Building (**8BR1998**)
- Parachute Refurbishment Facility (**8BR2014**)
- Canister Rotation Facility (now known as Launch Abort System Facility) (**8BR2016**)
- Payload Canisters (2) (**8BR2017**)
- Retrieval Ship *Liberty Star* (**8BR2019**)
- Retrieval Ship *Freedom Star* (**8BR2020**)
- Mobile Launcher Platforms (3) (**8BR2021**)
- Hypergol Module Processing South (**8BR2933**)

ELV context only

- Missile Assembly Building AE (**8BR2976**)

Project Mercury context only

- Hangar S (**8BR3070**)

ISS context only

- Space Station Processing Facility (**8BR2671**)

Apollo, Space Shuttle, and ISS context

- Banana River Bridge (**8BR2955**)
- Indian River Bridge (**8BR2956**)
- Haulover Canal Bridge (**8BR2957**)

RELEASED - Printed documents may be obsolete; validate prior to use.

Figure 4-4. *Central Instrumentation Facility (CIF).*

The **Central Instrumentation Facility (CIF) (8BR1692)**, built in 1965, was listed in the NRHP on January 21, 2000 in the context of the Apollo Program. It is significant at the national level under Criterion A in the areas of Space Exploration and Communications and under Criterion C in the area of Architecture. Because the resource has achieved exceptional significance within the past 50 years, Criteria Consideration G applies. The CIF was the hub of instrumentation and data processing operations during the Apollo Program. It provided instrumentation to receive, monitor, process, display, and record information received from the space vehicle during test, launch, and flight. This three-story building, designed in the International style, has remained essentially unaltered, except for small additions. The resource boundary extends from the outer perimeter of the structure approximately 3 m (10 ft), which includes all necessary components historically required to support its functions. There are plans to demolish the CIF in FY16 in support of the Central Campus development project and construction of the new Kennedy Data Center.

Figure 4-5. *Neil Armstrong Operations and Checkout (O&C) Building.*

The **Neil Armstrong Operations and Checkout (O&C) Building (8BR1693)**, constructed in 1964, was listed in the NRHP on January 21, 2000 in the context of the Apollo Program. It is significant at the national level under Criterion A in the area of Space Exploration and under Criterion C in the areas of Engineering and Architecture. Because the O&C Building has achieved exceptional significance within the past 50 years, Criteria Consideration G applies. This historic property was originally used to assemble and test the Apollo spacecraft before launching. The International style building also provided crew training and preflight preparations and contained astronaut housing, laboratories, medical facilities, and the Apollo mission high-altitude chambers, which were used to assemble and test the integrated command, service, and docking modules in a simulated space environment (Butowsky 1981:11). A small chamber was moved to Hangar L in 1985 and was extensively altered. In later years, the facility was modified to support the Space Shuttle Program. Payload integration was performed primarily in the High and Low Bays. In 2007, all equipment in the Low Bay was removed, which included the ATM Clean Room (also known as the Apollo Test Mount Clean Room); Workstands 2 and 3; CITE Workstand 4; the Experiment Integration Test Stand (North Stand); and the Rack, Floor and Pallet Stand (Mideast Stand) to support Orion spacecraft processing. The boundary of the O&C Building extends from the outer perimeter of the structure approximately 3 m (10 ft), which includes all necessary components historically required to support its functions.

RELEASED - Printed documents may be obsolete; validate prior to use.

Figure 4-6. *Bioastronautics Operations Support Unit (BOSU).*

The **Environmental Health/Health Physics Facility (Bioastronautics Operations Support Unit, BOSU) (8BR2905)** is eligible for listing in the NRHP in the context of the Apollo Program. It is considered significant under Criterion A, in the area of Space Exploration. Because the facility was less than 50 years in age, Criteria Consideration G applies. The BOSU demonstrates one of the roles the USAF played in the U.S. Manned Space Program. Its period of significance is considered to be from 1964, when it was designed, through 1972, when the building was transferred to NASA for use as an occupational health clinic. The BOSU was constructed between 1964 and 1965 to house the Launch Site Recovery Command Post, a group of military personnel trained to rescue astronauts in the event of an emergency during the launch sequence. The BOSU also contained a completely equipped surgical suite. Although no emergencies ever occurred during a manned spaceflight launch, the BOSU housed a vital service to the U.S. Manned Space Program. In addition, it served as the location where the Apollo 1 astronauts were first taken following the fire within their capsule during a simulation at LC-34. The BOSU derived its primary significance from the surgical suite, located at the north end of the building. The resource boundary extended from the outer perimeter of the structure approximately 3 m (10 ft), which included all necessary components historically required to support its functions. This facility was demolished in 2013.

Figure 4-7. *Engineering Development Lab (EDL).*

The **Engineering Development Lab (EDL) (8BR2969**) was constructed between 1964 and 1966. The eastern addition was built in 1967. The facility was originally named the Flight Crew Training Building and renamed the Engineering Development Lab in 1985. The EDL is eligible for listing in the NRHP in the context of the Apollo Program under Criterion A in the area of Space Exploration. It is recognized under Criterion B for its association with the Apollo astronauts. The High Bay area at the south of the building was designed for the unique purpose of astronaut training. The EDL is currently used as the Swamp Works laboratory for hands-on prototyping and testing. It retains five NRHP aspects of integrity, including location, setting, design, materials, and workmanship. Integrity of feeling and association were compromised, because the original Apollo training simulators are no longer intact. The EDL NRHP boundary is defined as the footprint of the original 1966-1967 portion of the building and does not include any of the support buildings nor the walkway that connects to the SSPF.

RELEASED - Printed documents may be obsolete; validate prior to use.

Figure 4-8. *Vehicle Assembly Building (VAB).*

The **Vehicle Assembly Building** (**VAB) (8BR1684)** was listed in the NRHP on January 21, 2000 under the historic context of the Apollo Program. It has since gained importance in the context of the Space Shuttle Program. It is considered significant under Criterion A in the area of Space Exploration and under Criterion C in the area of Engineering. Because the VAB has achieved exceptional significance within the past 50 years, Criteria Consideration G applies. Structurally completed in 1965, the VAB was originally built to support the vertical assembly of the Saturn launch vehicles used for the Apollo, Skylab, and the Apollo-Soyuz Programs. Beginning in 1976, the VAB was reconfigured to support the Space Shuttle Program. High Bays 1 and 3 were used for the integration and stacking of the complete Space Shuttle vehicle atop the MLP. Bays 2 and 4 were used for storage and processing of the Shuttle's external tank (ET). In addition, High Bay 2 was used as contingency storage (safe haven) for the orbiters and High Bay 4 served as the site for payload canister operations and SRB contingency handling. KSC has released a solicitation for proposals for use of one of the VAB high bays. Constructed specifically for the assembly of space flight vehicles, the VAB is distinguished by the specially designed platform systems that provide access to specific components. It is also one of the world's largest buildings by volume. The VAB Utility Annex and Barge Terminal Facility are considered contributing resources to the VAB. The resource boundary extends from the outer footprint of the building approximately 3 m (10 ft), which includes all necessary components historically required to support its functions.

Figure 4-9. *Launch Control Center (LCC).*

The **Launch Control Center (LCC) (8BR1685)**, built in 1965, was listed in the NRHP on January 21, 2000 under the historic context of the Apollo Program. It has since gained importance in the context of the Space Shuttle Program. It is considered significant at the national level under Criterion A in the areas of Space Exploration and Communications and under Criterion C in the area of Architecture. Because the LCC has achieved exceptional significance within the past 50 years, Criteria Consideration G applies. The LCC was built originally to provide launch control in support of the Apollo, Skylab, and the Apollo-Soyuz Programs. Vital operations integral to the prelaunch preparation and launch of the Space Shuttle were performed at the LCC. No structural changes were made to the LCC in preparation for Space Shuttle Program operations. However, technological upgrades were made, including the installation of the Launch Processing System (LPS), including the Checkout, Control and Monitor Subsystem. In 2006, NASA renovated Firing Room 1 for the new space program, Constellation, which was subsequently cancelled in 2010. The Ares I-X rocket launch was conducted from Firing Room 1 on October 28, 2009. Ongoing modifications to firing rooms will prepare the LCC to support SLS and commercial space flight. In addition to its exceptional importance to the U.S. Manned Space Program, the building is distinguished as a fine example of International style architecture. The resource boundary extends from the outer perimeter of the structure approximately 3 m (10 ft), which includes all necessary components historically required to support its functions.

RELEASED - Printed documents may be obsolete; validate prior to use.

Figure 4-10. *Crawler Transporters.*

The two **Crawler Transporters** (also known as the **Crawlers**) **(8BR1688)**, built in 1965, were listed in the NRHP on January 21, 2000. Originally nominated to the NRHP in the context of the Apollo Program, the Crawlers continue to be important in the context of the Space Shuttle Program. They are significant at the national level under NRHP Criterion A in the areas of Transportation and Space Exploration and under Criterion C in the area of Engineering. Because they have achieved exceptional significance within the past 50 years, Criteria Consideration G applies. In 1977, the Crawler Transporters were designated National Historic Mechanical Engineering Landmarks by the American Society of Mechanical Engineers. At the time of their initial service in early 1967, they were believed to be the largest tracked vehicles in the world. The Crawlers are unique and constructed specifically for the task of transporting assembled space flight vehicles from the VAB to the launch pad. They underwent few modifications in support of the Space Shuttle Program and have provided continuous service to the Nation's space programs since the 1960s. The boundary incorporates all components within and including the perimeter of the external shell of each Crawler Transporter, which includes all necessary components historically required to support its functions.

Figure 4-11. *Crawlerway.*

The **Crawlerway (8BR1689)**, completed in 1965, was listed in the NRHP on January 21, 2000. Originally nominated in the context of the Apollo Program, the Crawlerway has since gained importance in the context of the Space Shuttle Program. It is significant under Criterion A in the areas of Transportation and Space Exploration and under Criterion C in the area of Engineering. Because it has achieved exceptional significance within the past 50 years, Criteria Consideration G applies. The Crawlerway was originally designed and built during the Apollo era as the roadway for the transportation of the combined MSS, LUT/launch vehicle, and Crawler, between the VAB and launch pad. It served the same function in the transportation of the Space Shuttle vehicle atop the MLP and Crawler and will continue to serve the next generation of launch vehicles. The Crawlerway is a unique dual-lane surface engineered to withstand the pressure from the massive weight of the combined launch vehicle, its support structure, and the Crawler. The portion of the Crawlerway located west of the VAB was altered ca. 1985 with the addition of modular office buildings, trailers, and a parking lot. The original Crawlerway remains under the temporary buildings and parking lot. The boundary of this historic property includes the length and width of the existing Crawlerway, roughly defined by an approximate 3 m (10 ft) buffer zone along the outer extent of the surface aggregate and expands to include the Facility Support Pedestals at each MLP Refurbishment Area. This includes the facility and all necessary components historically required for its functions.

RELEASED - Printed documents may be obsolete; validate prior to use.

Figure 4-12. *Press Site: Clock and Flag Pole.*

Figure 4-13. *Headquarters Building.*

The Press Site: Clock and Flag Pole (8BR1690), built in 1969, was listed in the NRHP on January 21, 2000. Originally nominated to the NRHP in the context of the Apollo Program, it continued to be important in the context of the Space Shuttle Program. This historic property is considered eligible under Criterion A in the areas of Space Exploration and Communications. Because the resource has achieved exceptional significance within the past 50 years, Criteria Consideration G applies. The Press Site: Clock and Flag Pole has served as the primary site for news media activities at KSC since the Apollo era. The countdown Clock marks the time to lift-off. Along with the Flag Pole flying the U.S. flag, these objects, situated in the direct sightline of the launch pads, comprise foreground used by the media during the countdown sequence and lift-off. Although the interior clock mechanism has been changed, the exterior of the clock, with a digital read-out, was original to the Apollo era. The standard-sized metal Flag Pole is also original to the Apollo era. Consequently, these objects are historically associated with all U.S. Space Program launches in the collective mind of the public that witnessed the worldwide broadcasts. The rectilinear boundary encompasses both objects and extends approximately 3 m (10 ft) from and parallel to the outermost edges of the Flag Pole on the north and the Clock on the south. In 2014, a new clock was installed at the original location maintaining its integrity (location, feel, and association). The replacement clock has a modern multimedia display. Plans are to place the retired Clock on display at the Visitor Complex.

The **Headquarters Building (8BR1691)**, constructed in 1965, was listed in the NRHP on January 21, 2000 in the context of the Apollo Program. It is also eligible under the Space Shuttle Program. It is significant at the national level under Criterion A in the area of Space Exploration and under Criterion C in the area of Architecture. Because the Headquarters Building has achieved exceptional significance within the past 50 years, Criteria Consideration G applies. This historic property was designed as the administrative center for KSC. It was essential to the Apollo Program as the site where all major decisions and meetings were conducted. Stylistically, the Headquarters Building is representative of the International style. The building was designed so that it could be enlarged incrementally. Although the interior has been modified, the Headquarters Building still retains the same configuration as in the 1960s and continues to function as the administrative center for KSC, housing many contractor and NASA offices (Anon. 1994:25-26). The resource boundary extends from the outer perimeter of the building approximately 3 m (10 ft), which includes all necessary components historically required to support its functions. The Headquarters Building is slated for demolition in fiscal year 2016 as part of the Central Campus development project in the KSC Industrial Area.

RELEASED - Printed documents may be obsolete; validate prior to use.

Figure 4-14. *Launch Complex 39 – Pad A.*

Launch Complex 39 (LC-39): Pad A (8BR1995), constructed in 1965, was listed in the NRHP on January 21, 2000 as a contributing resource within the **LC-39: Pad A Historic District** in the context of the Apollo Program. It has since gained importance in the context of the Space Shuttle Program. In addition to its contributions to the NRHP-listed historic district, Launch Pad 39A is considered individually eligible for National Register listing at the national level under Criteria A and C in the areas of Space Exploration and Engineering, respectively. Because it has achieved exceptional significance within the past 50 years, Criteria Consideration G applies.

Launch Pad 39A was the site of the first Saturn V launch, the Apollo 4 mission, and served the Apollo 11 mission in 1969, which took Armstrong, Aldrin, and Collins to the moon. In total, Launch Pad 39A was the platform for 11 Apollo missions and one Skylab mission, all using the Saturn V rocket. Beginning in 1976 and completed in 1978, the launch pad underwent major modifications to accommodate the Space Shuttle vehicle. The main elements of the rebuilt pad include the hardstand; the Flame Trench and Deflector system; the Fixed Service Structure (FSS, formerly part of the Apollo-era LUT); and the Rotating Service Structure (RSS), which includes the Payload Changeout Room (PCR). On April 14, 1981, Launch Pad 39A was the site for the first launch of the Space Shuttle Program, followed by another 81 launches. Many structural modifications have been made since 1986, including new weather protection structures and a fully computer-automated Payload Ground Handling Mechanism (PGHM). This pad is one of two sites at KSC specially designed and constructed to launch space vehicles. The boundary of the historic property extends from the outer perimeter of the concrete hardstand, approximately 3 m (10 ft), which includes all necessary structures and components historically required for its functions.

LC-39A was leased to SpaceX in April 2014 and will serve as a commercial launch facility. Modifications to the launch complex are being made to support launches of the Falcon Heavy and Falcon 9 rockets.

Figure 4-15. *Launch Complex 39 – Pad B.*

Launch Complex 39 (LC-39): Pad B (8BR2010), constructed in 1968, was listed in the NRHP on January 21, 2000 as a contributing resource within the LC-39: Pad B Historic District in the context of the Apollo Program. It has since gained importance in the context of the Space Shuttle Program. In addition to its contributions to the NRHP-listed historic district, Launch Pad 39B is considered individually eligible for National Register listing at the national level under Criteria A and C in the areas of Space Exploration and Engineering, respectively. Because it has achieved exceptional significance within the past 50 years, Criteria Consideration G applies.

Launch Pad 39B launched one mission for the Apollo Program with a Saturn V rocket and three for the Skylab Program, using the Saturn IB rocket. The Apollo-Soyuz Test Project mission in 1975 was the last use of Launch Pad 39B during the Apollo Program. Beginning in 1978 and completed in 1985, the launch pad underwent major modifications to accommodate the Space Shuttle vehicle. The main elements of the rebuilt pad include the hardstand; the Flame Trench and Deflector system; the FSS (formerly part of the Apollo-era LUT); and the RSS, which includes the PCR. On January 28, 1986, the *Challenger* was the first Space Shuttle to lift off from Launch Pad 39B, which ended disastrously approximately one minute after launch. In the aftermath of the *Challenger* accident, the launch pad underwent modifications, including new weather

RELEASED - Printed documents may be obsolete; validate prior to use.

protection structures. Launch Pad 39B served as the launch facility for NASA's Return to Flight following both the *Challenger* and *Columbia* accidents. This pad is one of two sites at KSC specially designed and constructed to launch space vehicles. A total of 53 Space Shuttle missions were launched from LC-39B. The boundary of the historic property extends from the outer perimeter of the concrete hardstand, approximately 3 m (10 ft), which includes all necessary structures and components historically required for its functions.

In 2008, a new Lightning Protection System (LPS) was constructed around LC-39B, in support of the Constellation Program, which was cancelled in 2010. The LPS consists of three free-standing towers approximately 184-m (605-ft) tall, with a network of grounding cables extending between the towers. The towers are spaced 24 m (80 ft) apart, forming an equilateral triangle around the launch pad surface. Furthermore, the FSS and RSS have been demolished and additional modifications in support of SLS are ongoing. A launch site for the Deployable Launch System is also being developed within the LC-39B perimeter.

Figure 4-16. *Beach House.*

The **Beach House (8BR2990)** is eligible for listing in the NRHP under Criterion A and B in the area of Space Exploration as a resource associated with the training of astronauts. It was built in 1962 as part of the Neptune Beach Subdivision and was purchased by NASA in 1963. The other buildings in the immediate area were demolished. The house was renovated and renamed the Astronaut Training Building, but was colloquially known as the Beach House. It was used as a retreat for astronauts and their families prior to launches. There have been numerous interior and exterior alterations, but the overall scale and massing remain intact, as well as the isolated beach location, setting, feeling, and association. The resource boundary is a 5.7 ha (14 ac) trapezoid with the Beach House near its center. It includes the house itself, as well as a substantial portion of the surrounding dunes, beach and viewshed. The house is currently used by NASA as a conference center.

Figure 4-17. *Shuttle Landing Facility (SLF) Runway.*

The **Shuttle Landing Facility** (**SLF) Runway (8BR1987)**, completed in 1976, is considered eligible for listing in the NRHP in the context of the Space Shuttle Program under Criterion A in the areas of Space Exploration and Transportation and under Criterion C in the area of Engineering. In addition to its individual eligibility, the SLF Runway also is a contributing resource within the **SLF Area Historic District**. The SLF Runway is significant as the site where all five orbiters originally arrived at KSC from their assembly plant in Palmdale, California. It served as the main landing site for the Shuttle vehicle, or as a return from landing site when weather or other issues necessitated the use of Edwards Air Force Base (AFB) as the landing facility. Under Criterion C, the SLF Runway was specifically engineered for the Space Shuttle orbiter. The 4,573-m (15,000-ft) length of the runway, excluding the 305-m (1,000-ft) overruns at each end, was necessary due to the speed, 303 mph, with which the orbiter lands. This length also makes the SLF Runway one of the longest runways in the world. In addition, the thickness of the runway, 40 cm (16 in) at the center and 38 cm (15 in) at the sides, is necessary to accommodate the weight of the orbiter. As the primary landing site for the orbiter, the SLF Runway was of exceptional importance to the Space Shuttle Program, and because it is less than 50 years in age, Criteria Consideration G applies. The resource boundary extends from the outer perimeter of the SLF approximately 3 m (10 ft), which includes the runway

RELEASED - Printed documents may be obsolete; validate prior to use.

property, its shoulders and overruns, and necessary components, such as runway lights, historically required for its functions.

Figure 4-18. *Landing Aids Control Building (LACB).*

The **Landing Aids Control Building (LACB) (8BR1988)**, completed in 1976, is considered eligible for listing in the NRHP in the context of the Space Shuttle Program under Criterion A in the areas of Space Exploration and Transportation. Because it has achieved exceptional significance within the past 50 years, Criteria Consideration G applies. In addition to its individual eligibility, the LACB is a contributing resource within the **SLF Area Historic District**. As the control center for flight operations, which supported the landing of the Shuttle orbiter, this facility was an essential component in the Space Shuttle Program. It was the main organizational point for the safety and rescue teams who assisted in the transfer of the astronauts from the orbiter to the Crew Transportation Vehicle and prepared the vehicle for transfer to the OPF. It also aided the Shuttle Training Aircraft Program by coordinating sessions for the astronauts to practice landing on the runway. Finally, it managed the transport of the orbiter on its Boeing 747 carrier when it landed at another NASA Center or travelled to another Center for rehabilitation. The resource boundary extends from the footprint of the LACB, approximately 3 m (10 ft), which includes all necessary components historically required to support its functions.

Figure 4-19. *Mate-Demate Device (MDD).*

The **Mate-Demate Device (MDD) (8BR1989),** built in 1978, is considered eligible for listing in the NRHP in the context of the Space Shuttle Program under Criterion A in the areas of Space Exploration and Transportation and under Criterion C in the area of Engineering. Because it achieved significance within the past 50 years, Criteria Consideration G applies. In addition to its individual eligibility, the MDD is a contributing resource within the SLF Area Historic District. The MDD was one of only two permanent devices constructed by NASA with the specific purpose of enabling the attachment and detachment of the Space Shuttle orbiter and the Boeing 747 Shuttle Carrier Aircraft (SCA) and was in use from the orbiter *Columbia's* first arrival at KSC (March 24, 1979). Under Criterion C, the MDD essentially served as a large crane for lifting the orbiter. As the primary means of connecting the orbiter to the SCA, the MDD was of exceptional importance to the Space Shuttle Program. The resource boundary extends from the outer footprint of the MDD, approximately 3 m (10 ft), which includes all necessary components historically required for its functions. The MDD was demolished in 2014.

RELEASED - Printed documents may be obsolete; validate prior to use.

Figure 4-20. *Orbiter Processing Facility (OPF) 1 and 2.*

The **Orbiter Processing Facility (OPF) (High Bays 1 and 2) (8BR1991)** was built in 1977 to house post-flight deservicing, testing, modifications, and preflight processing of the Space Shuttle orbiters. It is considered eligible for listing in the NRHP in the context of the Space Shuttle Program under Criteria A in the area of Space Exploration and under Criterion C in the area of Engineering. The OPF is of exceptional importance to the SSP, and because it is less than 50 years in age, Criteria Consideration G applies. In addition to its individual eligibility, the OPF is considered a contributing resource in the **Orbiter Processing Historic District**. The OPF is the first of only two structures designed and built exclusively for orbiter pre-flight and post-landing processing and each orbiter was processed for its first operational flight in this facility. Under Criterion C, the OPF, which was constructed specifically for the Space Shuttle Program, contains two large high bays, designed for the size of the orbiter, each with a platform system specifically designed around the shape of the orbiter. This system contains stationary platforms set at various levels, which provide access to the major areas of the orbiter. Each level is also fitted with moveable platforms for access to specific components. In addition, a clean room environment is provided around the payload bay when the doors are open. This uniquely designed equipment, rather than the building's exterior shell, provides the basis for the OPF's eligibility under Criterion C. The resource boundary extends from the outer footprint of the OPF, approximately 3 m (10 ft) to the west, north, and east, and approximately 76 m (250 ft) to the south, which includes all necessary components historically required for its functions.

Figure 4-21. *Orbiter Processing Facility (OPF) 3.*

The **Orbiter Processing Facility High Bay 3 (OPF-3)/Space Shuttle Main Engine Processing Facility (SSMEPF) (8BR1992)** originally served as the Orbiter Modification and Refurbishment Facility (OMRF). Constructed in 1986-1987, the facility was used to perform extensive, non-hazardous modification, rehabilitation, and overhaul of the orbiter fleet. In 1989, work began to convert the OMRF to an OPF. Shuttle-unique work platforms and GSE from the former Vandenberg Launch Site in California were reconstructed in the new OPF, completed in 1991. Compared with the OPF 1 & 2, OPF-3 was designed for easier flow of GSE in the high bay. Major improvements included a new built-in computerized cooling system and new hydraulic pumps located inside a support building instead of outside in the weather. In addition, a track system provides better access to the orbiter. The SSMEPF, completed in June 1998 as an addition to the OPF-3, was designed specifically for processing the Space Shuttle main engines in support of SSP flight operations.

The OPF-3 is considered eligible for listing in the NRHP in the context of the Space Shuttle Program under Criteria A in the area of Space Exploration and under Criterion C in the area of Engineering. Because it is less than 50 years old and has exceptional importance to the SSP, Criteria Consideration G applies. In addition to its individual eligibility, the OPF-3 is considered a contributing resource in the **Orbiter Processing Historic District**. The OPF-3 is significant as one of only two structures designed and built exclusively for orbiter pre-flight and post-landing processing. Under Criterion C, the OPF-3 contained a large high bay with a platform system specifically designed around the shape of the orbiter. This uniquely designed equipment, rather than the building's exterior shell, provided the basis for the

RELEASED - Printed documents may be obsolete; validate prior to use.

OPF-3's eligibility under Criterion C. The resource boundary extends from the outer footprint of the OPF-3, approximately 3 m (10 ft), which includes all necessary components historically required for its functions. A Real Property Use Permit between NASA KSC and Space Florida was entered into on October 6, 2011, which includes the exclusive use of OPF-3. Currently Boeing, through Space Florida, is utilizing OPF-3 for the manufacture and testing of the CST-100 spacecraft.

Figure 4-22. *Hypergol Module Processing (HMP) North.*

The **Hypergol Module Processing (HMP) North (8BR1993)** was built in 1964 to serve the Apollo Program. In 1976, internal modifications were made to support the checkout, refurbishment, and revalidation of the hypergolic fuel modules of the orbital maneuvering system (OMS), the reaction control system (RCS), and the auxiliary power units (APUs) of the Space Shuttle.

The HMP North is considered eligible for listing in the NRHP under Criterion A in the context of the Space Shuttle Program in the area of Space Exploration. Because it achieved exceptional significance within the past 50 years, Criteria Consideration G applies. In addition to its individual eligibility, the HMP is considered a contributing resource in the **Hypergolic Maintenance and Checkout Area (HMCA) Historic District**. The HMP is a one-of-a-kind facility used for processing the OMS pods, with the incorporated RCS, key components of the Space Shuttle vehicle system. The resource boundary extended from the footprint of the building, approximately 3 m (10 ft), which included all necessary components historically required to support its functions. HMP North was demolished in 2014.

Figure 4-23. *Thermal Protection System Facility (TPSF).*

The **Thermal Protection System Facility (TPSF) (8BR1994)** was built in 1988 specifically for the Space Shuttle Program. It is considered eligible for listing in the NRHP in the context of the Space Shuttle Program under Criterion A in the area of Space Exploration. Because the TPSF is less than 50 years old and has achieved exceptional importance to the Space Shuttle Program, Criteria Consideration G applies. In addition to its individual eligibility, the TPSF is considered a contributing resource in the **Orbiter Processing Historic District**. The significance of the TPSF is attributed to its function as the facility where the Space Shuttle's thermal protection and thermal control systems, which include tiles, gap fillers, and insulation blankets, as well as coatings and adhesives, were manufactured and repaired. These thermal protection materials and systems were essential to the success of the SSP. The resource boundary extends from the footprint of the building, approximately 3 m (10 ft), which includes all necessary components historically required for its functions.

RELEASED - Printed documents may be obsolete; validate prior to use.

Figure 4-24. *Rotation Processing Surge Facility (RPSF).*

The **Rotation/Processing Building (also known as the Rotation Processing Surge Facility [RPSF]) (8BR1997)** was constructed in 1984 specifically to rotate the Space Shuttle SRB segments. It is considered individually eligible for listing in the NRHP in the context of the Space Shuttle Program under Criteria A and C in the areas of Space Exploration and Engineering, respectively. Because the facility has achieved exceptional significance within the past 50 years, Criteria Consideration G applies. The RPSF was specifically designed to rotate the SRB segments, an operation vital to the preparation of the launch vehicle for its mission. The RPSF contains four workstands, each containing stationary platforms set at different levels that provided access to the various components of the SRB. This uniquely designed equipment, rather than the building's exterior shell, provided the basis for the RPSF's eligibility under Criterion C. The resource boundary extends from the outer footprint of the building, approximately 3 m (10 ft), which includes the facility and all necessary components historically required for its functions.

Figure 4-25. *Manufacturing Building.*

The **Manufacturing Building (8BR1998),** located in the BFF complex, was constructed in 1986 to support the fabrication and processing of Shuttle SRB non-motor components. It is considered individually eligible for listing in the NRHP in the context of the Space Shuttle Program under Criterion A in the area of Space Exploration. Because it has achieved exceptional significance within the past 50 years, Criteria Consideration G applies. As a manufacturing, processing and assembly facility for SRB non-motor components, the Manufacturing Building played a vital role in preparing the Space Shuttle launch vehicle for flight. The construction of this complex allowed the work on these SRB components to be consolidated into one facility, rather than at various facilities, such as the VAB and Hangar AF. The Manufacturing Building produced and refurbished the forward and aft skirts, the frustums, and other small components, essential to the reusability of these parts, a key feature of the SSP. The resource boundary extends from the footprint of the building, approximately 3 m (10 ft), which includes all necessary components historically required to support its functions.

RELEASED - Printed documents may be obsolete; validate prior to use.

Figure 4-26. *Parachute Refurbishment Facility (PRF).*

The **Parachute Refurbishment Facility (PRF) (8BR2014)** was originally built in 1964 to support parachute processing for Gemini and Apollo flights. In 1979, a major addition to the building was completed to support the Space Shuttle Program. Since this time, the PRF has been used to receive, clean, refurbish, pack and store the pilot, drogue, and main parachutes. The facility is considered eligible for listing in the NRHP under Criteria A in the context of the Space Shuttle Program in the area of Space Exploration. Because it has achieved exceptional significance within the past 50 years, Criteria Consideration G applies. The PRF fabricated and repaired a variety of parachute types and kept the parachute flight sets in excellent working condition. The main, drogue, and pilot parachutes were essential components to the recovery of the Space Shuttle SRBs. Deployed sequentially, the parachutes slowed the fall of the SRBs, which facilitated the recovery efforts and subsequent reuse. The parachute washer and dryer, along with the tensile testing machine, sewing machines, and parachute rail system were excessed in place when the facility was abandoned. The resource boundary extends from the outer footprint of the PRF, approximately 3 m (10 ft), which includes all necessary components historically required for its functions. The PRF is on a list of facilities to be deconstructed in fiscal year 2015, if a future use cannot be found.

Figure 4-27. *Canister Rotation Facility (CRF).*

The **Canister Rotation Facility (CRF) (8BR2016), now known as the Launch Abort System Facility (LASF),)** was specifically built in 1993 to accommodate Payload Canister rotation. It is considered eligible for listing in the NRHP in the context of the Space Shuttle Program under Criteria A and C in the areas of Space Exploration and Engineering, respectively. Because it has achieved exceptional significance within the past 50 years, Criteria Consideration G applies. The CRF was designed and built exclusively to provide for the horizontal and vertical rotation of the Payload Canister in support of the Space Shuttle Program. This building made possible a more efficient performance of the operation, which had previously been conducted in the VAB. Under Criterion C, the facility, designed as a 300,000-class clean room, contains a large high bay, with specialized equipment for the rotation of the payload canister. The uniquely designed atmosphere and equipment, rather than the building's exterior shell, provided the basis for the CRF's eligibility under Criterion C. The resource boundary extends from the outer footprint of the building, approximately 3 m (10 ft), which includes all necessary components historically required for its functions.

RELEASED - Printed documents may be obsolete; validate prior to use.

Figure 4-28. *Payload Canisters.*

The two **Payload Canisters (8BR2017)**, built in 1978, were large, environmentally-controlled cargo containers in which fully-integrated Shuttle payloads were transported from various processing or assembly facilities to the launch pads. They are considered eligible for listing in the NRHP in the context of the Space Shuttle Program under Criteria A and C in the areas of Space Exploration and Transportation, and Engineering, respectively. Because they have achieved exceptional significance within the past 50 years, Criteria Consideration G applies. The Payload Canisters held and transported processed payloads for Space Shuttle missions. Under Criterion C, they were uniquely designed and constructed to match the orbiter cargo bay and to safely transport payloads. The canisters contained specially designed environmental control systems, which are necessary to control the internal temperature, pressure, and humidity. The resource boundary incorporates all components within, and including, the perimeter of the external shell of each Payload Canister, which includes all necessary components historically required for its functions. The canisters were decommissioned and disposed of in 2011.

Figure 4-29. *Retrieval Ships.*

Retrieval Ships, *Liberty Star* (8BR2019) and *Freedom Star* (8BR2020) were built in 1980 and 1981, respectively, for the retrieval of expended SRBs and their associated flight hardware following launch. Each is considered eligible for listing in the NRHP under Criterion A in the context of the Space Shuttle Program in the area of Transportation. Because they have achieved exceptional significance within the past 50 years, Criteria Consideration G applies. The two ships were designed and constructed specifically for the task of SRB retrieval. As a result of SRB retrieval, the ships facilitated the reuse of flight hardware, thereby controlling costs and contributing significantly to the ongoing operations of the Space Shuttle Program.

Starting in 1998, they were also used to transport ETs from the Michoud Assembly Facility, near New Orleans, to KSC. The resource boundary of each incorporates all components within the perimeter of the external shell of the ship, which includes all necessary components historically required for its functions.

Liberty Star is now being used by the National Defense Reserve Fleet for training at the U.S. Merchant Marine Academy in Kings Point, New York. *Freedom Star* was transferred to the U.S. Department of Transportation as part of the James River Reserve Fleet for use as a training vessel.

RELEASED - Printed documents may be obsolete; validate prior to use.

Figure 4-30. *Mobile Launcher Platforms (MLP).*

The three **Mobile Launcher Platforms (MLPs) (8BR2021)** were originally built between 1963 and 1968, to serve as MSSs for the Saturn LUTs. They were modified extensively between 1976 and 1983 for the Space Shuttle Program. The MLPs are considered eligible for listing in the NRHP in the context of the Space Shuttle Program under Criteria A and C in the areas of Space Exploration and Engineering, respectively. Because they have achieved exceptional significance within the past 50 years, Criteria Consideration G applies. Under Criterion A, the MLPs are significant for their unique function in supporting the integration and stacking of the complete Space Shuttle vehicle in the VAB and its transport to the launch pads. Under Criterion C, the MLPs were specially designed, built, and modified to support launch vehicles. Each MLP was designed to carry the weight of a fueled shuttle, or roughly 13.7 million pounds. Although the MLPs were modified heavily from their original state to serve the SSP, they have undergone few alterations since then and continue to convey their historical function. The resource boundary incorporates all components within, and attached to, the external shell of each MLP, which includes all necessary components historically required for its functions.

Figure 4-31. *Hypergol Module Processing (HMP) South.*

The **Hypergol Module Processing South (8BR2933)** was built in 1964 and is considered a contributing resource in the **HMCA Historic District**. It is considered eligible for listing in the NRHP in the context of the Space Shuttle Program under Criterion A in the area of Space Exploration. Criteria Consideration G also applies since it has achieved significance within the past 50 years. HMP South is recommended as a one-of-a-kind facility used to test and process the Space Shuttle's forward RCS system, a key component of the shuttle vehicle system. In 2014, an Enhanced Use Lease was entered into between NASA KSC and United Paradyne Corporation for propellant storage and handling, and office space utilization in HMP South.

Figure 4-32. *Missile Assembly Building AE.*

The **Missile Assembly Building AE (8BR2976)** was built by the Air Force in 1959. It is individually eligible for listing in the NRHP under Criterion A for its significant association with KSC's ELV Program during its period of significance from 1961 to the present. This resource also relates to the Man in Space Themes C (The Exploration of Planets and the Solar System) and D (The Role of Scientific and Communications Satellites). The facility was first used by NASA in 1961 as a payload checkout facility for launches by the Jet Propulsion Laboratory, Delta

RELEASED - Printed documents may be obsolete; validate prior to use.

Payload Project, and Goddard Space Center. In 1995, KSC ceased using the high bay as a payload checkout facility. Since 1964, it has functioned as the main telemetry and communications building for all of NASA's unmanned rocket launches. Missile Assembly Building AE is considered a contributing resource in the **NASA-owned CCAFS Industrial Area Historic District**. The interior has undergone modifications as equipment and ELV Program needs changed, but maintains a continuity of use. The exterior of the building has remained largely unmodified since 1965 when in order to accommodate the Orbital Astronomical Observatory spacecraft, an airlock was constructed on the exterior vertical lift door and a monorail and hoist were installed. The resource boundary extends from the outer footprint of the building, approximately 3 m (10 ft), which includes all necessary components historically required for its functions.

Figure 4-33. *Hangar S.*

Hangar S (8BR3070), built in 1958, is considered individually eligible for listing in the NRHP in the context of Project Mercury under Criterion A in the area of Space Exploration for its role as the home of NASA's Pre-Flight Operations Division of Project Mercury at CCAFS from 1959 to 1963. Hangar S is also eligible under Criterion B for its association with the training activities of the original Mercury Seven astronauts. It also housed the first astronaut crew quarters efore they were moved to the Neil Armstrong O&C Building in March 1965. As a contributing resource in the **NASA-owned CCAFS Industrial Area Historic District** under Criterion C it is a good example of the hangar architecture that defines the District's character. Despite modifications made to the building after Project Mercury, the hangar retains sufficient physical integrity to convey its historic significance under Criteria A, B, and C. It is also significant under Theme B (The Effort to Land a Man on the Moon) of the Man in Space Theme Study. The resource boundary extends from the outer footprint of the building, approximately 3 m (10 ft), which includes all necessary components historically required for its functions. Hangar S is currently scheduled for demolition in fiscal year 2015, if future use cannot be found.

Figure 4-34. *Space Station Processing Facility (SSPF).*

The **Space Station Processing Facility (SSPF) (8BR2671)** was built between 1991 and 1994, and is eligible for listing in the NRHP in the context of the International Space Station Program under Criterion A in the areas of Space Exploration and Science and under Criterion C in the area of Engineering. The SSPF is significant for its hardware processing areas, specifically the High Bay, PRCU Room, Airlock, and nine associated Control Rooms. It is the only building in the United States designed and constructed exclusively for the pre-flight checkout and processing of ISS flight hardware. The Ammonia Vapor Containment Building is considered a contributing ancillary feature to the SSPF. All but three of the components that comprise the ISS underwent final preparations at the SSPF. Modules carrying equipment, experiments and supplies to the station were filled and unloaded at the SSPF. It is of exceptional importance to the ISS Program. The resource boundary extends from the outer footprint of the building, approximately 3 m (10 ft), which includes all necessary components historically required for its functions.

RELEASED - Printed documents may be obsolete; validate prior to use.

Figure 4-35. *Banana River Bridge.*

The **Banana River Bridge (8BR2955)** is considered significant in the context of the Apollo, Space Shuttle, and ISS Programs. Built in 1964, it is a two-lane, double-leaf bascule bridge on NASA Causeway East, which crosses over the Banana River.

This bridge is approximately two miles east of the KSC Industrial Area and connects KSC on the west with CCAFS on the east. It was renamed the Roy D. Bridges Bridge in 2003. This bridge is eligible under Criterion A in the areas of Space Exploration, Community Planning and Development, and Transportation, and Criterion C in the area of Engineering. The boundary is defined as the footprint of the bridge as measured from the concrete abutments on either end and includes the steel bascule portions, control houses, and reinforced concrete approaches.

Figure 4-36. *Indian River Bridge.*

The **Indian River Bridge (8BR2956**) was constructed in 1964 and is considered significant in the context of the Apollo, Space Shuttle, and ISS Programs under Criterion A in the areas of Space Exploration, Community Planning and Development, and Transportatin, and Criterion C in the area of Engineering. It is eligible for listing in the NRHP as significant transportation-related structures associated with the development of KSC during their period of significance from 1964 to the present. The resource boundary of the bridge is defined as the footprint of the bridge as measured from the concrete abutments on either end and includes the steel bascule portions, control houses, and reinforced concrete approaches. The Indian River Bridge is a divided, four-lane, double-leaf bascule bridge on NASA Causeway West, which crosses over the Indian River. It is located approximately four miles west of the KSC Industrial Area and provides a connection between the city of Titusville to the west and KSC.

Figure 4-37. *Haulover Canal Bridge.*

The **Haulover Canal Bridge (8BR2957)** was built in 1964 and 1965, and is essential for the movement of employees, building materials, and spacecraft parts to and from KSC. It is considered significant in the context of the Apollo, Space Shuttle, and ISS Programs under Criterion A in the areas of Space Exploration, Community Planning and Development, and Transportation, and Criterion C in the area of Engineering. It is a two-lane, double-leaf bascule bridge, which crosses over the Haulover Canal at the northern end of KSC. The Haulover Canal connects Mosquito Lagoon on the east with the Indian River on the west. There has been some modification to the control mechanisms and the windows of the control house were replaced. However, the bridge alignment remains the same, as does the majority of its materials. The boundary is defined as the footprint of the bridge as measured from the concrete abutments on either end and includes the steel bascule portions, control houses, and reinforced concrete approaches.

4.4.2 Historic Districts

In addition to the **39** individually eligible historic properties, **eight** listed or eligible historic districts have been identified for KSC:

Both Apollo and Space Shuttle context

- LC 39: Pad A Historic District (**8BR1686**)
- LC 39: Pad B Historic District (**8BR1687**)

RELEASED - Printed documents may be obsolete; validate prior to use.

Space Shuttle context only

- SLF Area Historic District (**8BR1986**)
- Orbiter Processing Historic District (**8BR1990**)
- SRB Disassembly and Refurbishment Complex Historic District **(8BR1996**)
- Hypergolic Maintenance and Checkout Area Historic District (**8BR2015**)
- NASA KSC Railroad System Historic District (**8BR2932**)

Project Mercury, Space Shuttle, and ELV context

- NASA-Owned CCAFS Industrial Area Historic District (**8BR3073**)

Of these, both **LC-39 Pads A and B** are listed NRHP historic districts. Each is significant in the context of both the Apollo and Space Shuttle Programs. Four additional historic districts were defined as a result of the 2006 NASA-wide survey and evaluation of assets associated with the Space Shuttle Program. A survey of the KSC railroad system assets conducted in 2012 defined the NASA KSC Railroad System Historic District (ACI 2012). In 2013, a historic resource survey was conducted of NASA-owned facilities located on CCAFS and resulted in a new eligible historic district (New South 2013). A description of the eight listed and eligible historic districts follows. Both contributing and noncontributing resources for each are provided in **Appendix E**.

The **eight** historic districts collectively contain **79** resources, of which **12** are considered individually listed or eligible, **67** are considered contributing, and **54** are considered noncontributing **(Table 4-4)**. In general, contributing resources are those properties that were present during the period(s) of significance (Project Mercury: 1959-1963; Apollo Program: 1961-1975; ELV: 1960-Present; Space Shuttle Program: 1969-2011, ISS: 1984-2020). They are significantly associated with one or more of these programs and all retain enough integrity to communicate their relative significance. Figures illustrating the internal configuration and boundaries of each historic district follow each historic district description.

Table 4-4. Contributing and Noncontributing Resources within KSC's Historic Districts.

District Name	C	IE	NC	Total
LC-39 Pad A	26	1	21	48
LC-39 Pad B	21	1	21	42
SLF Area	3	3	0	3
Orbiter Processing	3	3	0	3
SRB Complex	9	0	11	20
HMCA	3	2	1	4
Railroad System	7	0	0	7
CCAFS Industrial Area*	7 (9*)	2	0	7
Total	**79 (9*)**	**12**	**54**	**134**

Legend: C=contributing; IE=Individually eligible; NC= noncontributing; *SRB Complex also contributing (9 facilities)

The LC-39: Pad A Historic District (8BR1686) was originally built between 1963 and 1968 as one of the two sites to support the launch of Saturn vehicles into space during the Apollo era. Between 1976 and 1978, the LC-39A underwent major modifications necessary for the Space Shuttle Program. The historic district is octagonal in configuration and covers roughly .65 km^2 (.25 mi^2). The 2006 *Basic Information Guide* for CCAFS/KSC depicts 44 facilities located within the perimeter fence, which bounds the historic district. LC-39A has been leased to SpaceX for launching the Falcon 9 and Falcon Heavy rockets.

The "Missile Launch Complex 39 Site" was originally listed in the NRHP on May 24, 1973, for its association with the Man in Space Program. This historic property was reevaluated in 1996 in the context of the Apollo Program, and on January 21, 2000, the newly defined LC-39: Pad A Historic District was listed in the NRHP. At that time, the historic district contained 23 contributing resources and 34 noncontributing resources (including 20 trailers and temporary buildings) within its boundary. This historic district has since gained importance in the context of the Space Shuttle Program and is considered significant at the national level under Criteria A and C in the areas of Space Exploration and Engineering, respectively. Because it has achieved exceptional significance within the past 50 years, Criteria Consideration G applies. During the SSP, the historic district contained 26 contributing and 23 noncontributing resources. Of the original 23 contributing resources, 15 continue to be contributing under the context of the Space Shuttle Program, two (the RP-1 Facility [J8-1613] and Sewage Treatment

RELEASED - Printed documents may be obsolete; validate prior to use.

Plant No. 5 [J8-1705]) have been demolished, and five (Foam Building [J8-1564], Pump House [J8-1565], Sewage Lift Station [J8-1705A], Sewage Equipment Building [J8-1705B], and Azimuth Alignment Station [J8-1858]) no longer convey their significant historical functions and association. Of the original 34 noncontributing resources, six are now considered contributing under the context of the Space Shuttle Program and 18 have been demolished.

Combining both the Apollo and Space Shuttle Program contexts, there are a total of **26** contributing resources located within the historic district boundary, of which **five** are significant only under the Apollo context, **six** are significant only for their associations with the Space Shuttle Program, and **15** are distinguished under both historic contexts. The 26 contributing resources include 10 buildings and 16 structures. **Twenty-one** facilities within the historic district are generic support facilities, and thus, are considered noncontributing resources. The contributing resources are listed below. The boundary of the district is the chain link fence around the perimeter of the complex. Summary data for the contributing and noncontributing resources within the LC-39: Pad A Historic District is included in **Appendix E**, including dates of construction and resource type. Locations are depicted in **Figure 4-38**.

The contributing resources within the LC-39 Pad A Historic District include:

Apollo context only

- Compressed Air Building (No FMSF no.)
- Remote Air Intake Building (No FMSF no.)
- Azimuth Alignment Station (No FMSF no.)
- Foam Building (No FMSF no.)
- Pump House (No FMSF no.)

Both Apollo and Space Shuttle context

- Launch Pad 39 A (**8BR1995**)
- High Pressure GH2 Facility (**8BR2094**)
- LOX Facility (**8BR2095**)
- Operations Support Building A-1 (**8BR2096**)
- Camera Pad A No. 1 (**8BR2097**)
- LH2 Facility (**8BR2098**)
- Electrical Equipment Building No. 2 (**8BR2099**)
- Camera Pad A No. 6 (**8BR2100**)
- Electrical Equipment Building No. 1 (**8BR2101**)
- Operations Support Building A-2 (**8BR2102**)
- Slidewire Termination Facility (**8BR2103**)
- Water Chiller Building (**8BR2104**)
- Camera Pad A No. 2 (**8BR2105**)
- Camera Pad A No. 4 (**8BR2106**)
- Camera Pad A No. 3 (**8BR2107**)

Space Shuttle context only

- Water Tank (**8BR2108**)
- Flarestack (**8BR2109**)
- Electrical Equipment Building No. 3 (**8BR2110**)
- Electrical Equipment Building No. 4 (**8BR2111**)
- Hypergol Oxidizer Facility (**8BR2112**)
- Hypergol Fuel Facility (**8BR2113**)

The **LC-39: Pad B Historic District (8BR1687)** was originally built between 1964 and 1968 to support the launch of Saturn vehicles into space during the Apollo era. Between 1978 and 1985, Launch Pad 39B underwent major modifications for the Space Shuttle Program. It continues to be modified to support NASA's next generation of space vehicles.

The LC-39: Pad B Historic District is octagonal in configuration and covers roughly .65 km^2 (.25 mi^2). The 2006 *Basic Information Guide* for CCAFS/KSC depicts 44 facilities located within the perimeter fence that bounds the historic district. The "Missile Launch Complex 39 Site" was originally listed in the NRHP on May 24, 1973 for its association with the Man in Space Program. This historic property was reevaluated in 1996 in the context of the Apollo Program, ca. 1961 through 1975, and on January 21, 2000 the newly defined LC-39: Pad B Historic District was listed in the NRHP. At that time, the historic district contained 23 contributing resources and 34 noncontributing resources (including 20 trailers and temporary buildings) within its boundary. The LC-39: Pad B Historic District has since gained importance in the context of the Space Shuttle Program. It is considered significant at the national level under Criteria A and C in the areas of Space Exploration and Engineering, respectively. Because it has achieved exceptional significance within the past 50 years, Criteria Consideration G applies. The historic district contains 21 contributing and 24 noncontributing resources in the context of the Space

RELEASED - Printed documents may be obsolete; validate prior to use.

Figure 4-38. *Location of contributing and noncontributing resources within the LC-39: Pad A Historic District.*

RELEASED - Printed documents may be obsolete; validate prior to use.

Shuttle Program. Of the original 23 contributing resources, 15 continue to be contributing under the context of the Space Shuttle Program, six (the RP-1 Facility [J7-292], Sewage Treatment Plant No. 6 [J7-384], Hypergol Oxidizer Facility [J7-0490], Hypergol Fuel Facility [J7-0534], Electrical Equipment Building No. 3 [J7-0491], and Electrical Equipment Building No. 4 [J7-0535]) have been demolished, and four (Foam Building [J7-242], Sewage Lift Station [J7-384A], Sewage Equipment Building [J7-384B], and Azimuth Alignment Station [J7-537]) no longer convey their significant historical functions and association. Of the original 34 noncontributing resources, six are now considered contributing under the context of the Space Shuttle Program, and 19 have been demolished.

Combining both the Apollo and Space Shuttle Program contexts, there are a total of **21** contributing resources located within the historic district boundary, of which **four** are significant only under the Apollo context, **two** are significant only for their associations with the Space Shuttle Program, and **15** are distinguished under both historic contexts. The 21 contributing resources include eight buildings and 13 structures. Twenty facilities within the historic district are generic support facilities, and thus, are considered noncontributing resources. The boundary of the district is the chain link fence around the perimeter of the complex. The contributing resources are listed below. Summary data for the contributing and noncontributing resources within the LC-39: Pad B Historic District is included in **Appendix E**, including dates of construction and resource type. Locations are depicted in **Figure 4-39**.

Contributing resources within the LC-39: Pad B Historic District include:

Apollo context only

- Foam Building (No FMSF no.)
- Compressed Air Building (No FMSF no.)
- Azimuth Alignment Station (No FMSF no.)
- Remote Air Intake Building (No FMSF no.)

Both Apollo and Space Shuttle context

- Launch Pad 39B (**8BR2010**)
- Operations Support Building B-1 (**8BR2114**)
- High Pressure GH2 Facility (**8BR2115**)
- LOX Facility (**8BR2116**)
- Camera Pad B No. 6 (**8BR2117**)
- Camera Pad B No. 1 (**8BR2118**)
- LH2 Facility (**8BR2119**)
- Electrical Equipment Building No. 2 (**8BR2120**)
- Electrical Equipment Building No. 1 (**8BR2121**)
- Operations Support Building B-2 (**8BR2122**)
- Slidewire Termination Facility (**8BR2123**)
- Camera Pad B No. 2 (**8BR2124**)
- Water Chiller Building (**8BR2125**)
- Camera Pad B No. 4 (**8BR2126**)
- Camera Pad B No. 3 (**8BR2127**)

Space Shuttle context only

- Flarestack (**8BR2128**)
- Water Tank (**8BR2129**)
- Hypergol Oxidizer Facility (**8BR2130**)
- Hypergol Fuel Facility (**8BR2132**)

The **SLF Area Historic District (8BR1986)** contains **three** facilities (one building and two structures) located within the SLF Area:

Space Shuttle context only

- SLF Runway (**8BR1987**)
- LACB (**8BR1988**)
- MDD (**8BR1989**)

The three are individually eligible and contributing to the historic district. The resources within the historic district were originally built between 1976 and 1979 to support orbiter landing and post-landing operations.

The SLF Area Historic District is considered eligible for listing in the NRHP in the context of the Space Shuttle Program under Criteria A and C in the areas of Space Exploration and Engineering, respectively. Because it has achieved exceptional significance within the past 50 years, Criteria Consideration G applies. The period of significance for the SLF Area Historic District is from 1976, the date of the completed construction of Phase I, through 2011, the designated end of the Space Shuttle Program. The SLF Area Historic District is the site where all five orbiters originally arrived at KSC from their assembly plant in Palmdale, California. It served as the main landing site for the Shuttle vehicle, or as a return from landing site when weather or other issues necessitated the use of Edwards AFB as the landing facility. It also functioned as the main organizational hub for fire and rescue operations, security officers, safety and medical teams, and other KSC support operations during both shuttle landing and take-off,

RELEASED - Printed documents may be obsolete; validate prior to use.

in the event of an emergency return-to-launch-site (RTLS) maneuver. In addition, the SLF Area Historic District supports astronaut training. Under Criterion C, the contributing SLF (Runway) and MDD were specifically engineered for the SSP. The 4,573-m (15,000-ft) length of the SLF Runway, excluding the 305-m (1,000-ft) overruns at each end, was necessary due to the speed, 485 kph (303 mph), with which the orbiter lands. This length also makes the SLF Runway one of the longest runways in the world. In addition, the thickness of the runway, 40 cm (16 in) at the center and 38 cm (15 in) at the sides, is necessary to accommodate the weight of the orbiter. The contributing MDD, designed as a large crane for lifting the orbiter, is one of only two permanent structures constructed for this purpose. The district boundary extends from the outer perimeter of each contributing resource, approximately 3 m (10 ft), which includes all necessary structures and components historically required for its functions, as depicted in **Figure 4-40**. The MDD was demolished in 2014.

The **Orbiter Processing Historic District (8BR1990)** contains **three** facilities located within the VAB Area:

Space Shuttle context only

- OPF (**8BR1991**)
- OPF-3/SSMEPF (**8BR1992**)
- TPSF (**8BR1994**)

The three are individually eligible and contributing to the historic district. The resources within the historic district were constructed between 1977 and 1988 to support the Space Shuttle Program. The Orbiter Processing Historic District is considered eligible for listing in the NRHP in the context of the Space Shuttle Program under Criteria A and C in the areas of Space Exploration and Engineering, respectively. Because it has achieved significance within the past 50 years, Criteria Consideration G applies. The period of significance for the Orbiter Processing Historic District is from 1977, when the OPF was completed through 2011, the designated end of the Space Shuttle Program. The Orbiter Processing Historic District contains NASA's only facilities designed and built exclusively to support pre-flight and post-landing processing of the Space Shuttle orbiter. It is the only site where all five orbiters were processed for their first flights. Under Criterion C, design and method of construction of two of the contributing resources, the OPF and the OPF-3, clearly embody the specific requirements of the Space Shuttle Program. The OPF contains two large high bays, designed for the size of the orbiter. The OPF-3 has one high bay and contains the SSMEPF. Each high bay was built with a platform system specifically designed around the shape of the orbiter. This uniquely designed equipment, rather than the buildings' exterior shells, provides the basis for the Orbiter Processing Historic District's eligibility under Criterion C. The district boundaries extend from the footprint of one of the contributing resources, the OPF, approximately 3 m (10 ft) to the west, north, and east, and approximately 76 m (250 ft) to the south, and from the footprint of the other two contributing resources, the OPF-3 and the TPSF, approximately 3 m (10 ft) in all directions, which includes all necessary structures and components historically required for its functions, as depicted in **Figure 4-41**. NASA has entered into agreements for both OPFs. Boeing will manufacture and test the CST-100 spacecraft in OPF-3, and the USAF will continue development of their classified X-37B Program in OPF High Bays 1 and 2.

RELEASED - Printed documents may be obsolete; validate prior to use.

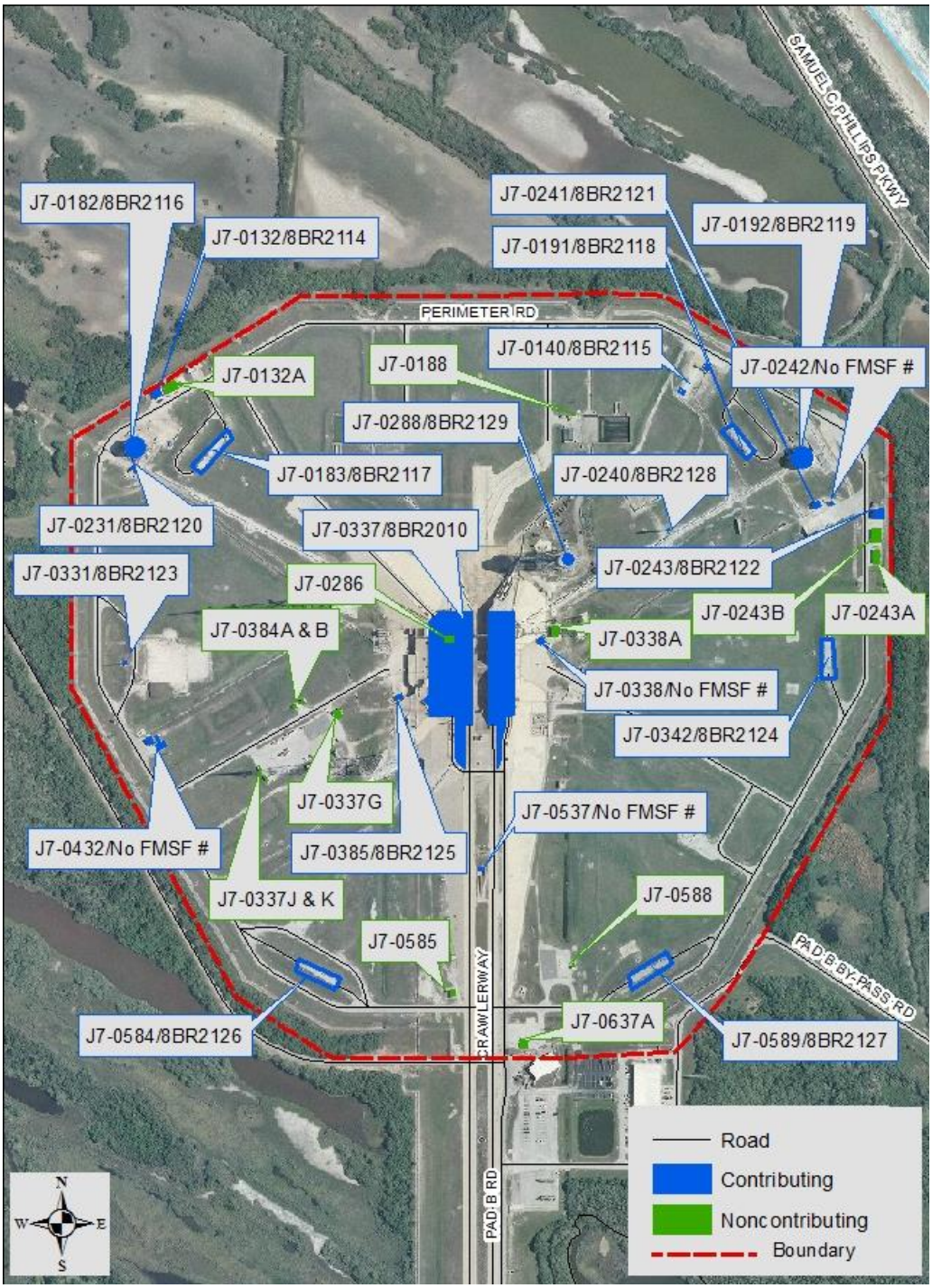


Figure 4-39. *Location of contributing and noncontributing resources within the LC-39: Pad B Historic District.*

RELEASED - Printed documents may be obsolete; validate prior to use.

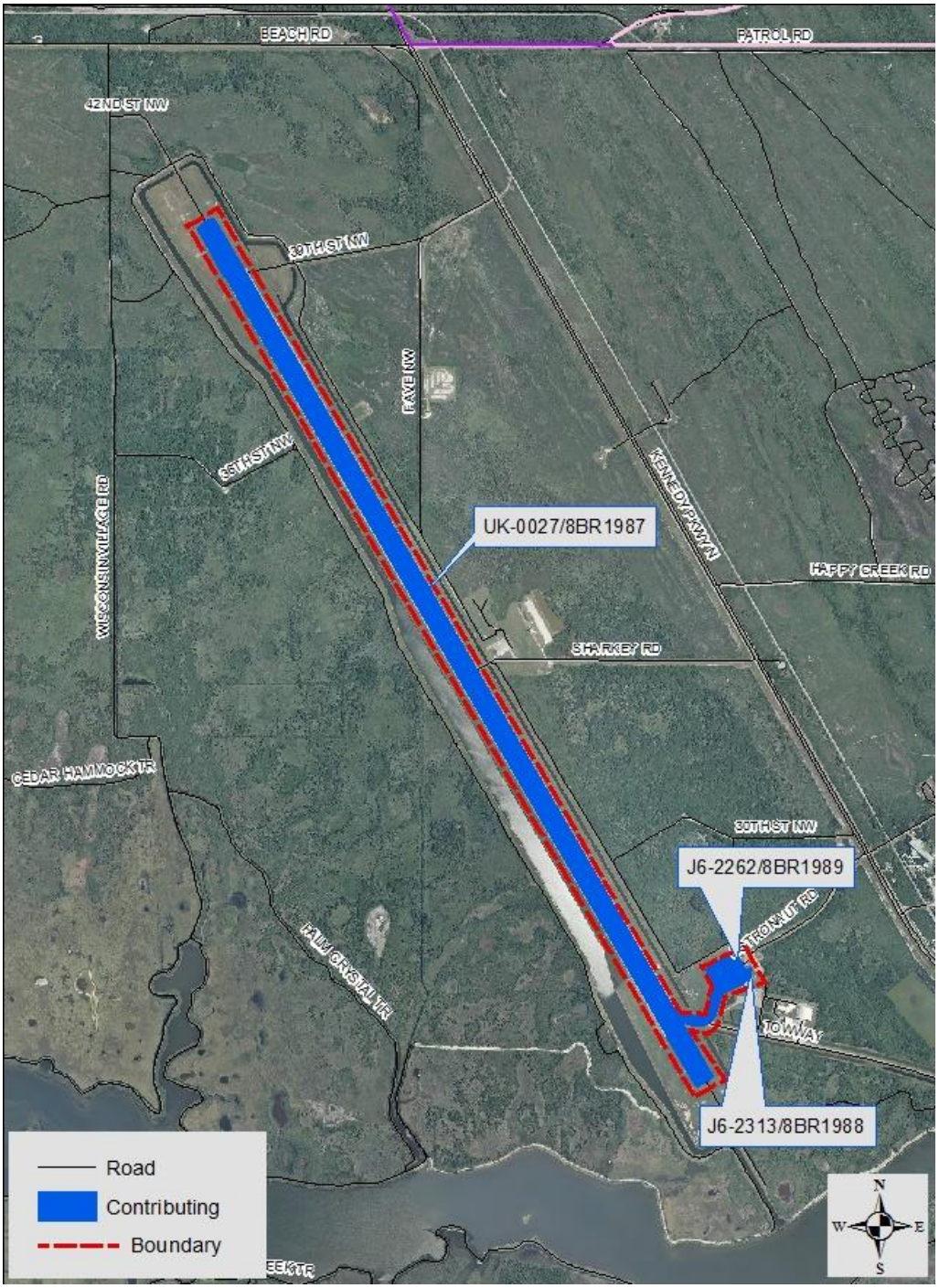


Figure 4-40. *Location of contributing resources within the SLF Area Historic District.*

RELEASED - Printed documents may be obsolete; validate prior to use.

Figure 4-41. *Location of contributing resources within the Orbiter Processing Historic District.*

RELEASED - Printed documents may be obsolete; validate prior to use.

The **SRB Disassembly and Refurbishment Complex Historic District (8BR1996)** contains a total of **20** (**nine** contributing, **11** noncontributing) facilities located within the SRB Complex also known as the Hangar AF Complex in the Industrial Area of CCAFS. The nine contributing resources (eight buildings and one structure), none of which is individually eligible, include:

Space Shuttle context only

- Hangar AF (**8BR2001**)
- High Pressure Gas Facility (**8BR2002**)
- High Pressure Wash Facility (**8BR2003**)
- First Wash Building (**8BR2004**)
- SRB Recovery Slip (**8BR2005**)
- SRB Paint Building (**8BR2006**)
- Robot Wash Building (**8BR2007**)
- Thrust Vector Control Deservicing Building (**8BR2008**)
- Multi-Media Blast Facility (**8BR2009**)

The 11 noncontributing resources (6 buildings and 5 structures) consist of warehouses, electrical substations, and storage facilities, constructed between 1961 and 2003. None played a significant role in the SRB disassembly and refurbishment process.

Hangar AF, as well as the High Pressure Gas Facility were originally built, in 1962 and 1963, respectively, to support Project Mercury and the Apollo Program. The other seven contributing resources were built specifically to support the Space Shuttle Program. The nine resources that contribute to the historic district were functionally related as processing facilities for the Shuttle SRBs. The SRB Disassembly and Refurbishment Complex Historic District is considered eligible for listing in the NRHP in the context of the SSP under Criterion A in the area of Space Exploration. Because it has achieved exceptional significance within the past 50 years, Criteria Consideration G applies. The period of significance for the SRB Disassembly and Refurbishment Complex Historic District is from 1981, when the first Space Shuttle launched through 2011, the designated end of the SSP. The SRBs are one of the major components of the Space Shuttle. Most of the structures within the historic district were specifically designed for processing SRBs, from pre-launch manufacture and assembly to post-launch recovery, disassembly, cleaning, and refurbishment in preparation for their next use. The historic district is also essential to the reusability of essential Space Shuttle components. The district boundaries are defined as the edges of the concrete hardscape that encompasses the Hangar AF/SRB Disassembly Complex area, which includes all necessary structures and components historically required for its functions, as depicted in **Figure 4-42**.

The **Hypergolic Maintenance and Checkout Area Historic District (8BR2015)** contains a total of **three** contributing facilities. The three contributing resources, all buildings, of which two (HMP North and HMP South) are individually eligible, include:

Space Shuttle context only

- HMP North (**8BR1993**)
- Hypergol Support Building (**8BR2000**)
- HMP South (**8BR2933**)

The GSE Storage Building is considered noncontributing. The HMCA was constructed in 1964 as a group of facilities for hazardous materials testing during the Apollo Program. With the onset of the Space Shuttle Program, the interiors of the HMCA facilities were remodeled in 1976.

The HMCA Historic District is considered eligible for listing in the NRHP in the context of the Space Shuttle Program under NRHP Criterion A in the area of Space Exploration. Because it has achieved exceptional significance within the past 50 years, Criteria Consideration G applies. The period of significance for the HMCA Historic District is from 1979, when the first flight-ready orbiter arrived at KSC for launch preparations through 2011, the end of the Space Shuttle Program. It is a one-of-a-kind complex used for processing the OMS pods, with the incorporated RCS, key components of the Space Shuttle vehicle system. The recorded district boundary begins at the intersection of 5th Street SE and G Avenue SE and extends for approximately 91 m (300 ft) to the west and 460 m (1509 ft) to the south, forming a rectangle, which includes all necessary structures and components historically required for its functions, as depicted in **Figure 4-43**.

HMP North and the Hypergol Support Building were both demolished in 2014. Due to loss of integrity of the historic district, NASA sought and received concurrence from the SHPO to remove the eligibility determination for the HMCA Historic District's name. The individual eligibility determination for HMP South will be retained.

RELEASED - Printed documents may be obsolete; validate prior to use.

Figure 4-42. *Location of contributing and noncontributing resources within the SRB Disassembly and Refurbishment Complex Historic District.*

RELEASED - Printed documents may be obsolete; validate prior to use.

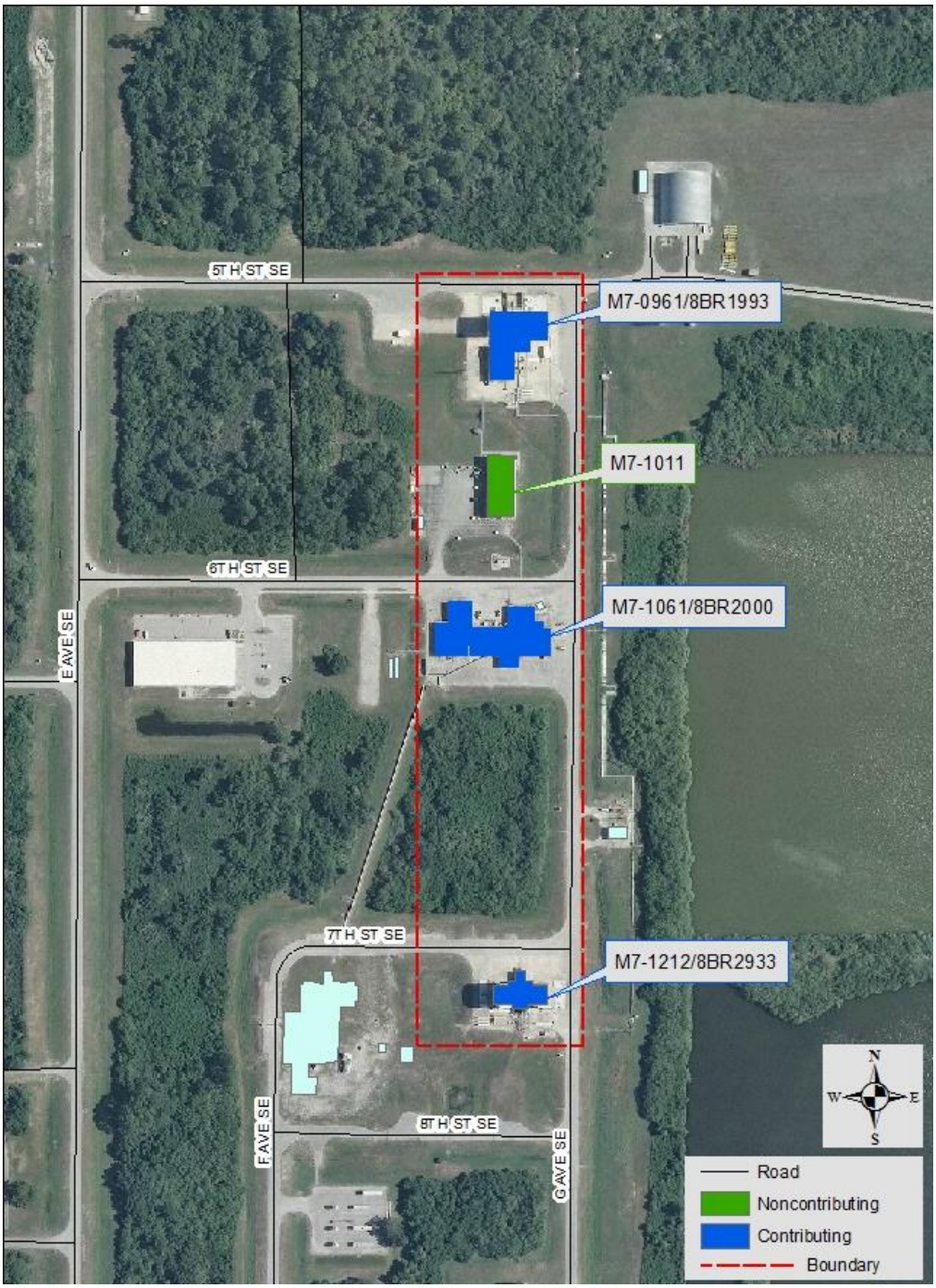


Figure 4-43. *Location of contributing and noncontributing resources within the Hypergolic Maintenance and Checkout Area Historic District.*

RELEASED - Printed documents may be obsolete; validate prior to use.

The **NASA KSC Railroad System Historic District (8BR2932)** contains seven contributing resources:

Space Shuttle context only

- Railroad Track (**8BR2931**)
- Jay Jay Bridge (**8BR2906**)
- Locomotive 1 (**8BR2923**)
- Locomotive 2 (**8BR3043**)
- Locomotive 3 (**8BR3044**)
- 70-Ton Aft Skirt Car (**8BR2908**)
- 70-Ton Aft Skirt Car (**8BR3042**)

The NASA KSC Railroad System Historic District includes approximately 19 miles of the railroad track extending from the Jay Jay Yard east to Wilson's Corner, continuing to just south of Schwartz Road and includes the small spurs to Suspect Siding and the RPSF (**Figure 4-44**). This historic district is considered eligible for inclusion in the NRHP in the context of the Space Shuttle Program under Criterion A for its significant historical associations in the areas of Space Exploration and Transportation. Criterion Consideration G also applies, because it has achieved exceptional national significance in the last 50 years. The period of significance for the NASA KSC Railroad System Historic District extends from 1978 when the first flight SRM segments arrived at KSC to 2010 when the final set of SRM segments were brought to the Center. The three locomotives transported everything that entered KSC from 1984 to 2011 via the railroad. Two locomotives remain at KSC, while Locomotive 2 was transferred to the Gold Coast Railroad Museum in Miami, Florida. The two aft skirt railcars supported delivery of SRB aft skirts, forward skirts, and frustums from California to KSC, one (8BR3042) has been transferred out of NASA ownership. The west boundary of the NASA Railroad is at the point in Titusville where it meets the Florida East Coast Line. One of two southern boundaries is where the west branch ends within the KSC Industrial Area, and the other is where the east branch reaches the boundary between KSC and CCAFS.

The **NASA-Owned CCAFS Industrial Area Historic District** (**8BR3073**) contains 10 facilities of which seven are contributing and three are noncontributing, as depicted in **Figure 4-45.**

Project Mercury, ELV, and Space Shuttle context

- Hangar N (**8BR3069**)
- Little N Storage Building (**8BR2190**)
- Hangar M Annex (**8BR2923**)
- Solar Array Test Building (**8BR2972**)
- E&O Building (**8BR2975**)
- Missile Assembly Building AE (**8BR2976**)
- Hangar S (**8BR3070**)

Of the seven contributing facilities, two are individually eligible (Missile Assembly Building AE and Hangar S). This district also contains the SRB Disassembly and Refurbishment Complex with nine contributing facilities. The SRB complex is recommended for inclusion in the NASA-owned Cape Canaveral Industrial Area Historic District and brings the total count to 19 facilities (16 contributing, and three noncontributing). Overall the buildings in the district have functional industrial vernacular designs. In contrast, the Hangar M Annex and E&O Building display generally Modern designs derived from the International style that was popular in the 1950s and 1960s military and institutional buildings. These facilities were grouped together away from the seaside launch complexes for safety reasons. Approximately 14 percent of the buildings on CCAFS are currently owned by NASA with the remainder owned and managed by the Air Force. The manned and unmanned space flight missions of NASA and the Air Force have overlapping histories and a number of buildings have changed hands between the two agencies over the past 50 years. The facility types range from engineering and administration, to vehicle processing. The district is eligible under Criterion A in the area of Space Exploration for its association with significant events in the history of NASA's manned and unmanned space programs. The district contains facilities that are associated with several NASA programs, including the unmanned ELV Program, Project Mercury, Apollo Program, and the Space Shuttle Program. These buildings are also eligible under Criterion C in the area of Architecture as a unified group of facilities that share distinctive architectural characteristics. The Man in Space National Historic Landmark Theme Study further categorizes the district's significance under Themes B (The Effort to Land a Man on the Moon), C (The Exploration of Planets and Solar System), and D (The Role of Scientific and Communications Satellites). Theme B represented Hangar S; C signified Assembly Building AE, and D embodies the Solar Array Test Facility and the Missile Assembly Building AE. The boundary is discontiguous along Hangar Road starting from Hangar N (Little N Storage Buiding) to the SRB Disassembly and Refurbishment Complex (Hangar AF Complex).

RELEASED - Printed documents may be obsolete; validate prior to use.

Figure 4-44. *Location of contributing and noncontributing resources within the NASA KSC Railroad System Historic District.*

RELEASED - Printed documents may be obsolete; validate prior to use.

Figure 4-45. *Location of contributing and noncontributing resources within the NASA-owned CCAFS Industrial Area Historic District.*

RELEASED - Printed documents may be obsolete; validate prior to use.

4.4.3 NASA-owned NHLs at CCAFS

Twenty-eight NASA-controlled facilities at CCAFS are designated as the 1984 NHL District (**Table 4-5**). These historic properties include MCC, LC-5/6, LC-19, and LC-34, and their respective support facilities. All are associated with the manned and unmanned U.S. Space Program and are nationally significant in the areas of communications, engineering, science, and space exploration. Five facilities within the designated NHL (**Table 4-5**) have since been demolished.

The **MCC**, completed in 1958, was used for all Mercury flights and the first three Gemini flights. It supported checkout, launch control, tracking, and astronaut training. After Gemini III, flight control was transferred to the new Mission Control Center at Johnson Space Center. In 1999, the control room consoles were removed and relocated to the KSC Visitor Complex, ESE exhibit. NASA and the SHPO agreed on mitigation measures in a 2009 MOA (**Exhibit 3-10**). The facility was demolished in 2010.

LC-5/6, constructed in 1955, is a dual pad facility with a shared blockhouse. It was built for the Redstone missile testing program and subsequently used to launch the Jupiter C, Juno I, Juno II, and Mercury/Redstone missiles. All of the Mercury/Redstone suborbital flights were launched from LC-5/6, including the launch of Alan Shepard in "Freedom 7" on May 5, 1961, and the launch of Gus Grissom in "Liberty Bell 7" on July 21, 1961. LC-5/6 and the NASA Space Museum are grouped with LC-26. In 2008, the NHL Condition Report noted that LC-5/6 was in satisfactory condition, with no current or potential threats.

LC-19 was built in 1959 to support the development and testing of large liquid fueled missiles and launch vehicles. The February 2, 1960 launch of a Titan I intercontinental ballistic missile (ICBM) marked the beginning of the Titan test program. LC-19 later became the launch site for the Gemini Program. Ten Gemini launches were flown from LC-19 in 1965 and 1966. Since the late 1970s, the launch complex has been stripped of many key features, including the umbilical tower, the launch stand, the fuel tanks, and all electrical equipment. KSC transferred the **Nitro Tube Bank Fill Station**, the **Storage Facility (Blockhouse)**, and the **Pond to the USAF in 2014.** These facilities were rated as "Watch (Priority 2)" in the 2008 NHL Condition Report. The Blockhouse was in good condition, the Nitro Tube Bank Fill Station was no longer extant, and the Pond was overgrown by vegetation. They were noted to face impending or potential actions that likely will cause a loss of integrity. NASA occupied the blockhouse until 2014 and used the facility for storage of Space Shuttle data tapes.

LC-34 was constructed between 1959 and 1961 to support the flight testing program for the Saturn I and Saturn IB launch vehicles. All of the Saturn I test flights from 1961 to 1963 were launched from LC-34. The complex was reconfigured between 1963 and 1965 to launch the Saturn IB. The Complex was the site of the first NASA spaceflight tragedy, Apollo 1 in January 1967, which took the lives of astronauts Gus Grissom, Edward White, and Roger Chaffee. Apollo 7 was launched from LC-34 in October 1968 and was the first manned Apollo mission. By serving as one of the primary facilities for testing the Saturn missile, LC-34 played a pivotal role in the success of the Apollo Program. The development of the larger, more powerful Saturn V necessitated the construction of LC-39 at KSC. As a result, LC-34 was deactivated (mothballed) in November 1971. The Service Structure and Umbilical Tower were demolished in April 1972 due to excessive deterioration. LC-34 was officially abandoned in place in October 1973. Soon thereafter, many of the structures were removed from the real property records, demolished, or moved to other complexes. The Administration Office was relocated to LC-30 in 1972. Although most of the control panels and machinery were removed, the Blockhouse remains largely intact, with the original periscopes and most of the original finishes in place (ACI 2003:37-38). The Operations Support Building (Environmental Support Building) was demolished in 2007 following documentation to HABS/HAER standards (HAER No. FL-8-6).

RELEASED - Printed documents may be obsolete; validate prior to use.

Table 4-5. List of NHL-designated NASA-Controlled Facilities at CCAFS.

Facility #	Facility Name	Year Built
15730	Storage Facility LC-19	1959
15830	Pond Contaminated Liquid/LC-19	1959
19015	Nitro Tube Bank Fill Stat/LC-19	1976
1207	Camera Pads/LC 5/6	1955
1207	Secondary Overhead/LC 5/6	1955
1207	Secondary Underground/LC 5/6	1955
1207	Roads/LC 5/6	1955
1207	Security Fence/LC 5/6	1955
1207	Sewage Disposal System/LC 5/6	1955
1207	Storm Drainage System/LC 5/6	1955
1207	Vehicle Parking/LC 5/6	1955
1207	Water Distribution System/LC 5/6	1955
1207A	Blockhouse/LC 5/6	1955
1207B	Launch Pad 5	1955
1207C	Launch Pad 6	1955
1207E	Pad Service Building/LC 5/6	1955
1207F	Electrical Distribution Bldg./LC 5/6	1955
1207G	Ready Room/LC 5/6	1955
1207H	High Pressure Air Bldg./LC 5/6	1955
1207J	Generator Building/LC 5/6	1955
1207M	Emergency Power Building/LC 5/6	1955
1207S	Septic Tank/LC 5/6	1955
1207W	Water Well N/Pot/LC 5/6	1955
1385	Administrative Building Mission Control Center	1958
21900H	Engineering Support Building/LC-34	1961
21917	Hazardous Waste Storage Shed/LC-34	1994
21918	Hazardous Waste Storage Shed/LC-34	1994
21919	Hazardous Waste Storage Shed/LC-34	1994

Demolished

Transferred to USAF

RELEASED - Printed documents may be obsolete; validate prior to use.

LC-34 was rated as "Watch (Priority 2)" in the 2008 NHL Condition Report. The Blockhouse was in good condition. Only the launch mount, pad, blast deflector, and several ancillary buildings remain. These historic properties are no longer maintained, and as a result, are experiencing slow deterioration due to the salt air environment.

In June 2008, Tom Penders, 45th Space Wing Cultural Resource Manager, conducted a survey of LC-34. Penders documented the complex as a Resource Group (8BR2279) that included 22 contributing resources. FMSF numbers were obtained for each facility. LC-34 is one of the six locations at CCAFS being preserved through 3-D imaging conducted by University of South Florida's Alliance for Integrated Spatial Technologies (Florida Today 2014). NASA has entered into a 20-year lease agreement for LC-34 with the USAF effective September 1, 2007. Under this agreement NASA is implementing a groundwater cleanup remedy for contamination at LC-34 that occurred during NASA operations at the launch complex.

4.4.4 Non-extant and Ineligible Historic Properties

The MSS and three MLPs/LUTs were included in the original (1973) NRHP LC-39 Site. However, the MSS was subsequently demolished, and thus, not included in the original (1998) NRHP Multiple Property submission. The "milkstool" used to raise the Saturn IB into position was not included in the original nomination. It is no longer extant, and therefore, was not evaluated as part of the Apollo or Space Shuttle Program historic facilities surveys.

The three MLPs/LUTs were drastically modified to serve the needs of the Space Shuttle Program (Butowsky 1984a:54-55; NASA n.d.:26; NASA 1974:9-87). Major modifications consisted of removing each umbilical tower from its two-story steel launch platform (now MLP) and relocating holddown posts and exhaust holes on the platform. Two of the LUTs were modified by the removal of select tower arms, the 25-ton hammerhead crane, and lower work platforms. These two towers were affixed (one each) to the built-up portion (the hardstand) of Launch Pads 39 A and B, where they are used as FSSs. The combined units consisting of the FSSs and the hardstands are considered contributing parts of the historic districts at Launch Pads 39 A and B (Butowsky 1981:54-55; NASA n.d.:26; NASA 1974:9-87).

The third LUT, from which the first successful lunar landing mission was launched, was dismantled in 1983. Eighteen tower sections, the hammerhead crane arm assembly and crane housing, and eight service arms were transported to an outdoor storage area in the Industrial Area. Two top sections of the LUT (platforms 320 and 380) with the crane arm assembly were moved from storage for display at the Apollo/Saturn V Center. The launch platform of this LUT was modified and used as a MLP to support the Shuttle Transportation System.

Since 2006 to 2014, many facilities and structures were evaluated and determined ineligible for listing in the NRHP (Exhibit 4-1). These facilities may become eligible at a later date.

RELEASED - Printed documents may be obsolete; validate prior to use.

EXHIBIT 4-1
PROPERTIES DETERMINED INELIGIBLE FOR LISTING IN THE NRHP

RELEASED - Printed documents may be obsolete; validate prior to use.

PROPERTIES DETERMINED INELIGIBLE FOR LISTING IN THE NRHP				
Facility #	**Name**	**Date**	**NRHP Status**	**FMSF #**
Agency-wide Space Shuttle Program Historic Survey				
J5-1197	SLF Air Traffic Control Tower	2003	Not Eligible	
J6-2465	Flight Vehicle Support Building	2002	Not Eligible	
K6-015	Convoy Vehicle Enclosure (T-Shelter)	2001	Not Eligible	
K6-1547	Logistics Facility	1986	Not Eligible	
J8-1564	Foam Building	1965	Not Eligible and Non-Contributing to LC39A Historic District (previously Contributing to Historic District within Apollo context)	
J7-1565	Pump House	1964	Not Eligible and Non-Contributing to LC39A Historic District (previously Contributing to Historic District within Apollo context)	
J8-1659	Compressed Air Building	1965	Not Eligible and Non-Contributing to LC39A Historic District (previously Contributing to Historic District within Apollo context)	
J8-1753	Remote Air Intake Building	1965	Not Eligible and Non-Contributing to LC39A Historic District (previously Contributing to Historic District within Apollo context)	
J8-1858	Azimuth Alignment Station	1965	Not Eligible and Non-Contributing to LC39A Historic District (previously Contributing to Historic District within Apollo context)	
J7-242	Foam Building	1968	Not Eligible and Non-Contributing to LC39B Historic District (previously Contributing to Historic District within Apollo context)	
J7-338	Compressed Air Building	1967	Not Eligible and Non-Contributing to LC39B Historic District (previously Contributing to Historic District within Apollo context)	
J7-432	Remote Air Intake Building	1967	Not Eligible and Non-Contributing to LC39B Historic District (previously contributing to Historic District within Apollo context)	
J7-537	Azimuth Alignment Station	1967	Not Eligible and Non-Contributing to LC39B Historic District (Previously Contributing to Historic District within Apollo context)	
K6-495	Support Building	1984	Not Eligible	
K6-497	Surge Building #1	1984	Not Eligible	
K6-345	Surge Building #2	1984	Not Eligible	

RELEASED - Printed documents may be obsolete; validate prior to use.

PROPERTIES DETERMINED INELIGIBLE FOR LISTING IN THE NRHP (cont.)				
Facility #	**Name**	**Date**	**NRHP Status**	**FMSF #**
Agency-wide Space Shuttle Program Historic Survey (cont.)				
L6-147	Chiller Building	1986	Not Eligible	
L6-146	Engineering and Administration Building	1986	Not Eligible	
L6-248	Service Building	1986	Not Eligible	
L6-295	Harzaroud Waste Staging Building	1992	Not Eligible	
L6-297	Storage Building	1988	Not Eligible	
L7-251	Aft Skirt Test Building	1986	Not Eligible	
1728	Hangar N*	1958	Not Eligible	
M7-1011	HMCA GSE Support Building	1988	Not Eligible and Non-Contributing to HMCA Historic District	
M5-1494	MILA Operations Building	1966	Not Eligible	
M7-505A	Launch Equipment Test Facility	1976	Not Eligible	
M7-505	Payload Support Building	1964	Not Eligible	
M7-1469	Vertical Processing Facility	1964	Not Eligible	
	Crew Transportation Vehicle (CTV)		Not Eligible	
	Astrovan		Not Eligible	
	Payload Canister Transporters (2)	2000	Not Eligible	
	Solid Rocket Motor Transporter		Not Eligible	
	Orbiter Transporter		Not Eligible	
HMP South and Boresight Control Building Historic Survey				
M7-0867	Boresight Control Bu9lding	1963	Not Eligible	8BR2934
45-50 Year Historic Survey				
54905	Paint Storage Building*	1958	Not Eligible	8BR2974
45928	Little N Storage Building*	1958	Not Eligible	8BR2190
55005	Hangar M Annex*	1963	Not Eligible	8BR2972
60425	Pressure Proof Test Cell	1958	Not Eligible	8BR2973
60540	Solar Array Test Building*	1966	Not Eligible	8BR2977
60650	E&O Building*	1961	Not Eligible	8BR2975
66220	Emergency Breathing Equipment Maintenance Building	1960	Not Eligible	8BR2961
J6-0553	Storage Facility (Weather Sub-Station B)	1964	Not Eligible	8BR2994
K7-0255	Magazine No. 1 – Ordnance Storage	1995	Not Eligible	8BR2978
K7-0306	Magazine No. 2 – Ordnance Storage	1965	Not Eligible	8BR2979
K7-0356	Magazine No. 3 – Ordnance Storage	1965	Not Eligible	8BR2980
K7-0405	Magazine No. 4 – Ordnance Storage	1965	Not Eligible	8BR2981
K7-0506	Ordnance Laboratory No. 1	1965	Not Eligible	8BR2982
M7-1417	Ordnance Laboratory No. 2	1966	Not Eligible	8BR2995
K7-0416	Operations Building No. 1	1967	Not Eligible	8BR2992
K7-0468	Converter/Compressor Operations Building	1965	Not Eligible	8BR2993
K7-0569	Converter/Compressor Opeations Building	1967	Not Eligible	8BR2991
L7-1557	Environmental Health Building	1965	Not Eligible	8BR2958
*Eligible under the NASA-owned CCAFS Industrial Area Historic Survey				

RELEASED - Printed documents may be obsolete; validate prior to use.

PROPERTIES DETERMINE INELIGIBLE FOR LISTING IN THE NRHP (cont).				
Facility #	**Name**	**Date**	**NRHP Status**	**FMSF #**
45-50 Year Historic Survey				
M6-0336	Electromagnetic Laboratory	1965	Not Eligible	8BR2967
M6-0399	Base Operations Building	1965	Not Eligible	8BR2959
M6-0409	Spaceport Central	1967	Not Eligible	8BR2998
M6-0486	Base Support Building	1964	Not Eligible	8BR2960
M6-0493	Industrial Area Support Building	1964	Not Eligible	8BR2963
M6-0495	Occupational Health Building	1964	Not Eligible	8BR2962
M6-0589	Support Building	1965	Not Eligible	8BR2964
M6-0688	Propellants Shop	1966	Not Eligible	8BR2965
M6-0689	Transportation Storage Building	1966	Not Eligible	8BR2968
M6-0695	Fire Station No. 1	1964	Not Eligible	8BR2966
M6-0794	Supply Warehouse No. 1	1965	Not Eligible	8BR2988
M6-0698	Supply Wareshouse No. 2	1965	Not Eligible	8BR2987
M6-0744	Central Supply	1964	Not Eligible	8BR2996
M6-0894	Paint & Oil Locker	1965	Not Eligible	8BR2997
M7-0351	Auditorium & Training Building	1964	Not Eligible	8BR2999
M7-0409A	EDL Equipmen Building	1966	Not Eligible or Contributing to EDL	8BR2970
M7-1472	Radiothermaliosotopic Generator Facility	1964	Not Eligible	8BR2989
P6-1435	Indoor Range & Clubhouse	1966	Not Eligible	8BR2985
P6-1638	Recreation Building	1963	Not Eligible	8BR2984
P7-1738	Arts & Crafts Building	1963	Not Eligilble	8BR2983
NASA-owned CCAFS Industrial Area Historic District Survey				
54905	Paint Storage Building	1958	Not Eligible	8BR2974
60425	Pressure Proof Test Cell	1958	Not Eligible	8BR2973
49637	Vehicle Shelter	1992	Not Eligible	
54945	Hazardous Waste Staging Shelter	1986	Not Eligible	
60541	Electrical Storage Building	1977	Not Eligible	
60628	POL	2009	Not Eligible	
60630	POL Facility, Hangar AF	1983	Not Eligible or Contributing to the Hangar AF Historic District	
60631	Blast Wall	1989	Not Eligible or Contributing to the Hangar AF Historic District	
60640	Payload Container and GSE Storage Building	1985	Not Eligible	
60674	Backup Generator	2011	Not Eligible	
60675	Diesel Fuel Tank	2011	Not Eligible	
60677	Antenna Structure	2006	Not Eligible	
60678	Antenna Structure	2006	Not Eligible	
60679	Antenna Structure	2006	Not Eligible	
60683	Equipment Pad	1968	Not Eligible	
60686	Antenna	2002	Not Eligible	
60687	Storage Building	1994	Not Eligible	
60690-1	Tank, Boiler	1980	Not Eligible	
60216	Propane Tank	1998	Not Eligible	
60232	Range Contractor Shop	1986	Not Eligible	

RELEASED - Printed documents may be obsolete; validate prior to use.

PROPERTIES DETERMINED INELIGLE FOR LISTING IN THE NRHP (cont).				
Facility #	**Name**	**Date**	**NRHP Status**	**FMSF #**
NASA-owned CCAFS Industrial Area Historic District Survey				
66237	Hazardous Waste Staging Shelter	1984	Not Eligible	
66238	Hazardous Waste Staging Shelter	1984	Not Eligible	
66241	Deionized Water Tank	1979	Not Eligible	
60257	Boiler Building	1966	Not Eligible	
66257A	Fuel Tank	1968	Not Eligible	
66259	Equipment Building	1994	Not Eligible	
66266	Drum Storage Building	1994	Not Eligible	
66267	Tank Farm Area	1994	Not Eligible	
66297	X-Band Radar pad	2007	Not Eligible	
66310-1	Tank, Waste Detergent	1984	Not Eligible	
66310-2	Tank, Waste Alodine	1984	Not Eligible	
66311	Substation	1984	Not Eligible	

RELEASED - Printed documents may be obsolete; validate prior to use.

Chapter 5.0 ADMINISTRATION, POLICY, AND PLANNING

5.1 INTRODUCTION

This chapter of the ICRMP includes the administrative framework, policies, and general strategies required to implement the CRM Program. It includes the responsibilities of the HPO; Agency and Center-specific policies; and long- and short-term resource management planning goals. A discussion of the internal and external personnel and agencies involved in the CRM Program (Section 5.2) is followed by policies and strategies for complying with the NHPA (Section 5.3), ARPA (Section 5.4), NAGPRA (Section 5.5), 36 CFR Part 79 (Section 5.6), and EO 13287, Preserve America (Section 5.7). Sections 5.8 and 5.9 continue with an overview of treatment strategies and mitigation measures for historic properties and archaeological sites. The final sections address records and data management (Section 5.10), CRM training (Section 5.11), public outreach (Section 5.12), and CRM Program planning (Section 5.13). Section 5.14 concludes with a note on implementation of the ICRMP.

5.2 CRM ADMINISTRATION

The CRM Program requirements are part of Center senior management and staff responsibilities to integrate the management and preservation of cultural resources in accordance with NPR 8510.1, NASA Cultural Resources Management. This is delegated to the EMB (TA-A4C) of the Medical and Environmental Management Division (TA-A4). Within the EMB, the HPO carries out the day-to-day CRM responsibilities on behalf of KSC and serves as the official point of contact (POC) for all historic preservation issues. The general duties of the HPO are listed in Section 5.2.1.

The HPO coordinates with the manager of the program/project that is subject to review under Section 106. The program/project is responsible for providing funds for the surveys and mitigation measures. Once funds are secured, the HPO implements the **historic preservation** activities. KSC has no budgetary line item for historic preservation; the majority of activities are program/project-driven.

5.2.1 Historic Preservation Officer

The administration of all cultural resources reviews and compliance issues, including official communications between KSC and external regulatory and review agencies, including the SHPO and ACHP, is the responsibility of the Center's HPO. The HPO may delegate certain CRM responsibilities, as deemed appropriate. Where the services of consultants are used, the HPO provides technical review of all phases of the investigation. The specific roles and responsibilities of the HPO include, but are not limited to:

- Oversees and develops policies, priorities, procedures, and budgets for the CRM Program
- Ensures compliance under Sections 106 and 110 of the NHPA
- Responds to NASA HQ data calls (e.g., ARPA, NAGPRA, andEO 13287, Preserve America)
- Prepares appropriate forms for use by the CRM Program and contractors
- Prepares project-specific Statements of Work (SOW)
- Records, documents, evaluates, and nominates archaeological and historic resources
- Determines the significance of cultural resources in accordance with the NRHP criteria of eligibility
- Prepares Determinations of Effects for undertakings
- Maintains and validates archaeological and historic resources inventories within the NASA Environmental Tracking System (NETS)
- Maintains and/or oversees the GIS database for cultural resources
- Serves as the primary POC with the SHPO and the ACHP
- Serves as the primary expert on cultural resources and provides support to facility program and planning
- Supports cultural resource activities for EAs, EISs, and the NEPA checklist process
- Assists in planning, scoping, development, design, and direction of major projects to minimize and/or avoid effects on cultural resources
- Seeks alternatives and solutions to undertakings with the potential to adversely affect historic properties
- Analyzes, reviews, and evaluates documents, proposals and studies that pertain to cultural resources

RELEASED - Printed documents may be obsolete; validate prior to use.

- Contracts for CRM studies, as needed, and oversees execution of studies by contractors and outside organizations
- Ensures that contractors are qualified professionals meeting the Secretary of the Interior's Professional Qualifications Standards
- Prepares budgets for mitigation measures in advance to minimize risks through avoidance of cost and schedule impacts
- Coordinates with the FPO and Project/Program Managers, as needed
- Completes CRM training on an annual basis
- Identifies potential consulting or interested parties to the Section 106 process, as needed for each project, and provides justifications to file for those decisions
- Develops a records retention policy for CRM documents
- Coordinates with the Real Property Officer to make sure that the NETS CRM Module and the Real Property Management System (RPMS) are consistent in the listing of "historic" (i.e., National Register listed or eligible) real property
- Meets with Master Planning and Program/Project managers to discuss strategic planning for historic properties
- Ensures that archaeological collections are maintained at a repository in accordance with 36 CFR Part 79 and that NASA KSC retains title to the collections
- Ensures that archaeological collections are reviewed by a trained professional to identify NAGPRA-related remains and objects of cultural patrimony
- Makes sure that any identified NAGPRA-related remains or artifacts have been identified by permanent repositories in NAGPRA reports to the NPS
- Provides training, as needed or requested, to contractor managers and other professional staff on cultural resources and historic preservation laws
- Interfaces and coordinates activities with the KSC Archivist, Photo Lab personnel, Public Affairs Media, and DVD Publication and Website Team
- Coordinates with the managers and Center Director for signatures on agreement documents or concurrence of properties eligible for listing in the NRHP
- Provides the FPO with an opportunity to review and comment on draft agreement documents such as MOAs and PAs, and also on controversial cases
- Informs the FPO of Section 106 consultation cases that may lead to a foreclosure from the ACHP or a decision to terminate consultation from the SHPO
- Leads consultation with federally-recognized Native American tribal representatives for Section 106 and NEPA actions
- Coordinates responses to emergency discovery situations (i.e., archaeological sites or human remains)
- Prepares presentation slides to management on CRM activities and status updates
- Prepares correspondence such as letters, briefing notes, etc., for CRM activities
- Tracks Section 106 undertakings and mitigation measures
- Coordinates and consults with other Center HPOs, when needed
- Participates in audits (EFR [Environmental Functional Review], records, etc.)
- Provides a yearly report to the SHPO on cultural resource activities at KSC

5.2.2 NASA Headquarters

Historically, each NASA Center operated independently, and the NASA HQ EMD provided technical support and guidance on cultural resource matters, when requested. Today NASA's FPO directs an Agency-wide, HQ-led, integrated CRM Program. The FPO works within NASA's Office of Infrastructure and Administration, EMD. Acting on behalf of the EMD, the FPO also conducts triennial reviews (audits) of the status of surveys and CRM plans. The FPO actively encourages the HPOs from all ten NASA Centers and three Component Facilities to share existing scopes of work, studies, and reports with each other and to generally share best practices. The FPO assists Center HPOs in interactions with the ACHP, the NPS, and the THPOs.

5.2.3 External Regulatory and Review Agencies

As part of the Section 106 process, the HPO regularly coordinates and consults with two outside regulatory and review agencies: the ACHP and the SHPO. Contact information is provided in **Exhibit 5-1**.

RELEASED - Printed documents may be obsolete; validate prior to use.

The **ACHP** is an independent federal agency established by Section 201 of the NHPA of 1966. It is charged with reviewing federal programs and policies to promote effectiveness, coordination, and consistency with national preservation policies. The ACHP may participate in resolving adverse effects, comment on proposals, and review agreement documents under Section 106. Its primary role is to consult and comment.

The **SHPO** administers federal and state historic preservation activities in Florida. This official participates in the Sections 106 and 110 review processes by advising and assisting in KSC's identification of historic properties and the determination of whether specific undertakings will or will not have an effect on historic properties, in accordance with 36 CFR Part 800.2(c)(1). The SHPO may also enter into agreements with KSC regarding historic properties.

In addition to the SHPO and ACHP, the regulations implementing the NHPA encourage the involvement of **other parties** in Section 106 consultations, including Indian Tribes "that attach religious and cultural significance to historic properties that may be affected by an undertaking," representatives of local governments, and certain individuals and organizations "with a demonstrated interest in the undertaking."

5.2.4 Interagency Coordination

NASA shares a complex land ownership and management history with the FWS and the NPS, both agencies of the DOI. On August 28, 1963, NASA and FWS (also known as the Refuge) entered into a cooperative agreement to establish the MINWR. In this agreement, **KCA-1649, Rev. B**, (**Exhibit 5-2**), amended in July 2012, NASA transferred management authority to the Refuge for a portion of KSC's land and water. By 1972, the area managed by FWS was expanded to include all nonoperational areas of the Center. On April 2, 1975, Congress established the CNS (also known as the Seashore) as a unit of the NPS. This act transferred management responsibility of Playalinda Beach and about 405 ha (1,000 ac) north of the Gomez Grant line to the NPS. An agreement between NASA and the DOI (**KCA-4307**) for use of property at KSC as a part of the CNS has been in place since April 2, 1975 (**Exhibit 5-3**). The Seashore was established partially as an overlay of KSC on lands and waters already managed as part of the MINWR. Congress outlined that the majority of the overlay area, consisting of 13,899 ha (34,345 ac), would be managed as a refuge (FWS 2008). **Figure 5-1** illustrates the overlapping jurisdictional lands of KSC, MINWR, and CNS.

RELEASED - Printed documents may be obsolete; validate prior to use.

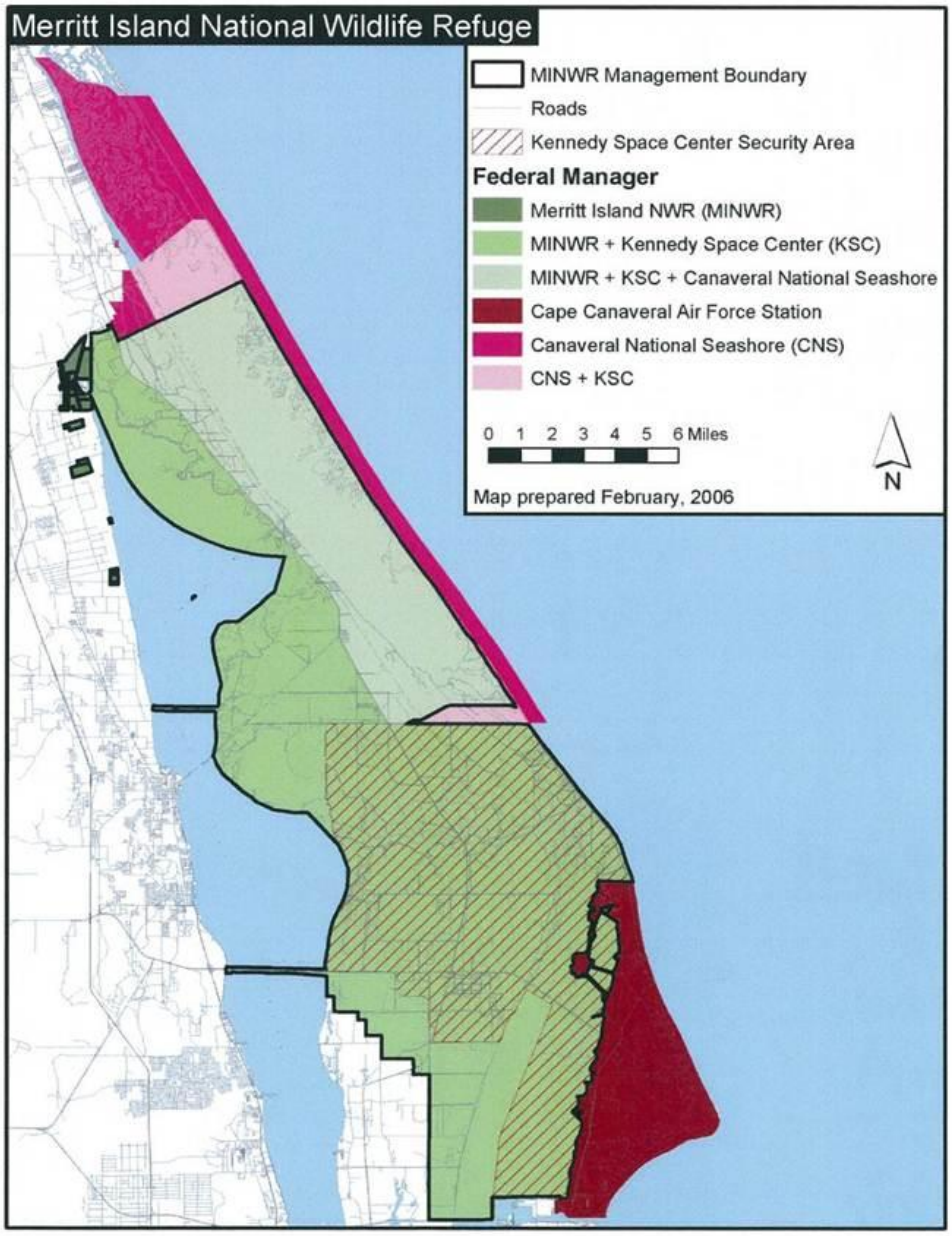


Figure 5-1. *Management Areas of KSC, MINWR, CNS, and CCAFS.*

RELEASED - Printed documents may be obsolete; validate prior to use.

Today, most of NASA's lands are managed by the DOI as a national seashore and national wildlife refuge. NASA retains title to the property and the agreement allows NASA to withdraw lands required to support space-related purposes. The Refuge manages over 56,251 ha (139,000 ac) of NASA-owned land. Within the Refuge/Seashore overlap or Joint Area (JA), located east of SR-3 (**Figure 5-1**), the NPS takes the lead on cultural resource management, including research, interpretation, and protection of archaeological and historical sites. Any site protection and/or development of these sites must be fully coordinated with the FWS, in accordance with an MOU between MINWR and CNS signed on July 10, 1975. A subsequent interagency agreement on June 18, 1981, amended in 1987, 1990, and 1997, and approved by NASA, establishes cooperation on mutual programs between the two agencies, including the management of cultural resources. The FWS is the lead agency for cultural resources located outside the JA and for enforcement activities within the JA. The FWS is also responsible for the citrus groves (inactive), maintenance of the mosquito control dikes and water control structures, fire management (i.e., controlled burns), boating, commercial fishing, hunting, and recreation (FWS 2008).

The HPO is the POC with personnel at the MINWR and CNS ensuring that future undertakings, including the development of recreational facilities, dike road construction, clearing and exotic vegetation removal, elimination of fallow groves, and fire management, among other activities, will take into account cultural resource concerns. The HPO will also work with the FWS and CNS to ensure that archaeological surveys at KSC precede undertakings that involve ground disturbance in all areas delimited as zones of high and moderate site location potential. Contact information for the MINWR, CNS, and NPS is provided in **Exhibit 5-1**.

5.2.5 Contractors

KSC retains the services of contractors to assist in their regulatory compliance efforts. Such work includes archaeological and historical surveys in compliance with Sections 106 and 110 of the NHPA and mitigation measures for significant historic properties, including archaeological excavation and documentation consistent with HABS/HAER standards. The HPO prepares the SOW for each project, serves as the POC, and provides oversight and quality assurance on all work performed by the contractors.

Personnel qualified to conduct cultural resource projects for KSC are those individuals who meet the training and experience criteria for historians, archaeologists, architectural historians, and other professionals as set forth in Archaeology and Historic Preservation: Secretary of the Interior's Standards and Guidelines.

5.3 NHPA COMPLIANCE

5.3.1 Section 110 Identification and Evaluation

Archaeological Resources: While a comprehensive KSC-wide archaeological survey has not been performed, approximately 5% of KSC has been surveyed. Between 1990 and 1996, a KSC-wide site location predictive model for aboriginal sites was developed, tested, and refined. The SHPO reviewed the sensitivity area maps and concurred with the locations of all ZAPs (Walker 1990, 1991, 1992; Kammerer 1993 in **Exhibit 3-1**). In 2008/2009, the predictive model was updated and expanded to include historic period archaeological sites. The SHPO concurred on February 2, 2010. The ZAPs for historic period archaeological sites were added to the GIS predictive model database.

The existing GIS-based predictive model is an important tool used to assist in the early stages of project planning. During the project review process, and prior to any land altering activities, the HPO examines the predictive model maps to determine if a systematic, professional Phase I archaeological survey is required. To the extent possible, such surveys will result in the location, description, and evaluation of any cultural resources present within the project APE.

The maps depicting the ZAPs, including both the USGS quadrangles as well as the digitized GIS version, will be reviewed and updated regularly, on a schedule to be determined by the HPO. The electronic version will be kept in a restricted access file and both these data and the original maps will be provided only to authorize personnel.

An update of the archaeological sites GIS layer was performed in 2009. A new GIS layer showing areas that have been surveyed was developed in 2014.

As a result of the 2008/2009 Predictive Model Survey, 20 historic features were recommended for a Phase I survey. The sites and associated ZAP numbers include (ACI 2009):

RELEASED - Printed documents may be obsolete; validate prior to use.

- Elliot Plantation/Ross Hammock (**ZAP #2**)
- Old Kings Road, Elliot Plantation Road (**ZAP #3, 12**)
- Elliot Plantation - sugar works and slave village (**ZAP #11**)
- Shiloh townsite (**ZAP #17**)
- Shiloh fish camp (**ZAP #27**)
- Beacon fish camp (**ZAP #31**)
- Clifton/Haulover townsite (**ZAP #32**)
- Allenhurst townsite (**ZAP #34**)
- Old Haulover, Fort Ann, Futch Homestead, Sykes grove (**ZAP #37**)
- Ragin fish camp (**ZAP #39**)
- Dummett Homestead (**ZAP #41**)
- Bull Camp fish camp (**ZAP #53**)
- Wilson's Corner townsite (**ZAP #64**
- Benecke Homestead/Happy Creek hunting and fishing camp (**ZAP #73**)
- Town of Heath (**ZAP #77**)
- Town of Orsino (**ZAP #91**)
- Town of Audubon (**ZAP #101**)
- Canaveral Club (**ZAP #118**)
- Chester Shoals House of Refuge/Coast Guard Station (**ZAP #119**)
- Titusville Beach homesites (**ZAP #121**)

In addition to ongoing surveys associated with planned development, 13 recorded archaeological sites pose a special concern, since their locations have not been verified. These sites include:

- No Name (**8BR60)**
- No Name (**8BR61**)
- Moore Mound (**8BR62**)
- No Name (**8BR84**)
- Butler Campbell's Mound (**8BR142**)
- Oyster Prong Creek (**8BR150**)
- No Name (**8BR156**)
- No Name (**8BR159**)
- Black Point Midden (**8BR160**)
- No Name (**8BR161**)
- No Name (**8BR191**)
- Titusville Beach West #1 (**8BR915**)
- Titusville Beach West #2 (**8BR916**)

Five of these sites (**8BR62, -142, -150, -160, and -191**) may contain human remains. None of the 13 sites were found during the 1990-1996 KSC-wide archaeological surveys due to inaccessibility by land, or because of vague or inaccurate site location data. Efforts to locate, archaeologically test, and evaluate these sites will be part of KSC's ongoing endeavors to identify and evaluate all significant cultural resources within KSC.

The location of **8BR84**, reportedly associated with the 1565 French fleet under Jean Ribault that was lost to a hurricane, is particularly problematic. In his 1951 publication on the archaeology of the Indian River area, Irving Rouse situated this site near LC-34 based on a previous description, which used the distance from the Canaveral Lighthouse as a point of reference. Long's 1967 Space Center report, on the other hand, plotted the site in the vicinity of LC-39B, on the basis of informant information. During the KSC-wide Archaeological Survey, neither the Ribault fortification nor cannons reportedly at the site could be found. A magnetometer survey of the general site area was conducted by SEAC archaeologists in 2006 with negative results (Hellman 2007).

To the extent possible, all NRHP-listed and eligible sites, in addition to all sites not yet evaluated, will be protected until their significance has been assessed.

Historic Properties: The KSC inventory of historic properties, and concurrence by the SHPO with the significance evaluations, is described in Section 3.3. Future surveys of historic facilities will be planned as NASA programs or missions end, as existing facilities reach 45 years of age, or if an undertaking includes demolition or major modifications to the property. A survey will be performed to determine its historic significance to the space program.

NRHP Nominations: In compliance with Section 110(a)(2) of the NHPA, National Register nominations have been prepared for archaeological sites and historic properties at KSC. The Center Director approves all nominations. These are signed by the FPO before they are submitted to the SHPO, who in turn conveys them to the National Register.

In the future, assets considered NRHP-eligible will be added to the Multiple Property nomination. If KSC and the SHPO disagree about the eligibility of any historic resource, KSC will obtain a formal Determination of Eligibility from the NPS's Keeper of the National Register, whose decision is final.

In 1973, Robert G. Yoder, Manager of the MINWR, prepared a National Register nomination for 10 archaeological sites:

RELEASED - Printed documents may be obsolete; validate prior to use.

- Dummit Cove Orange Grove (**8BR78D**)
- Fort Ann (**8BR175**)
- Old Haulover Canal (**8BR188**)
- Onion Island (**8BR141**)
- Ross Hammock Indian Mounds (**8VO131**)
- Butler Campbell's Indian Mound (**8BR142**)
- Nauman's Place Indian Mound (**8BR77**)
- Sugar Mill Ruins (**8VO160**)
- "Indian Mound Southeast of Sugar Mill Ruins" (**8VO148**)
- Ross Hammock Salt Rendering Plant (**8VO213**)

In 1978 the Old Haulover Canal (**8BR188**) was listed, followed in 1981 by the Ross Hammock Archaeological District (**8VO2569**) consisting of the Midden (**8VO130**), Burial Mounds (**8VO131**), and Salt Works (**8VO213**). Since that time, no other archaeological resources have been listed in the NRHP.

Several other archaeological sites have been evaluated as eligible or potentially eligible, based upon available data; whereby, the SHPO concurred with these findings (Walker 1991; Kammerer 1993 in **Exhibit 3-1**). The FMSF database may not accurately reflect prior SHPO determinations of eligibility, specifically, **12** sites listed in the FMSF database as "not evaluated" by SHPO were previously assessed as potentially eligible, and another **four** sites listed as "insufficient information" also were determined potentially eligible.

Following an archaeological survey in the KSC North Area (ACI 1992), a recommendation was made that three sites be nominated to the National Register: Fort Ann (**8BR175**), the Douglas Dummett Homestead and Orange Grove (**8BR78B and D**), and the Sugar Mill Ruins (**8VO160**). The SHPO concurred with these recommendations in a 1993 project review letter (Kammerer 1993 in **Exhibit 3-1**). In a FMSF submission, dated March 15, 2013, SEAC recommended at least a National Register Nomination be prepared for the Elliot Plantation Complex (**8VO9407**) and that a National Historic Landmark nomination be considered for the site.

In addition to these sites, other archaeological resources, including those identified as potentially eligible (Category B) in Section 4.3.2, should be nominated to the NRHP. A Multiple Property nomination is considered the most appropriate means of documentation. The majority of potentially eligible archaeological sites will require more archaeological research and field testing to fully document their significance. To be considered eligible, each site shall possess the following:

- Physical integrity, i.e., *in situ* remains, which have not been severely disturbed by natural disturbances or human activity
- Cultural integrity, i.e., distinct, datable components
- Informational yield sufficient to address research questions of regional importance
- Distinctive characteristics of type

Between 1996 and 1997, a Multiple Property nomination was prepared for historic facilities within the Launch Complex 39, VAB, and Industrial Areas of the KSC. This reassessment of the existing National Register-listed Launch Complex 39 Site included 10 historic properties, as described in Section 3.3.2.

In 2006, the historic context was updated with the addition of the Space Shuttle Program context, and the significant historic facilities associated with this program were identified and evaluated. Historic context updates since then include the ISS Program (2010), ELV Program (2013), and Project Mercury (2014). Additions to the Multiple Property cover nomination as well as individual property nominations are described in Section 3.3.4.

5.3.2 Section 106 Review

When a new undertaking is proposed, the HPO follows the steps in the Section 106 process from determining if the undertaking has the potential to affect historic properties, through the resolution of adverse effects. The specific steps of this process are elaborated in Chapter 1, Chapter 6, CRM Action Plan: Standard Operating Procedures, and **Figures 1-1 and 1-2**.

In May 2009, a "Programmatic Agreement among the National Aeronautics and Space Administration, Advisory Council on Historic Preservation, and the Florida State Historic Preservation Officer Regarding Management of Historic Properties at the John F. Kennedy Space Center, Florida" was executed. This agreement document, which focuses on historic properties, allows the HPO to make certain determinations of "No Significant Properties Affected" (No Effect) under Section 106 without public notification or consultation with the SHPO or

RELEASED - Printed documents may be obsolete; validate prior to use.

ACHP. The PA contains a list of proposed actions (undertakings) exempt from Section 106, as agreed to by the SHPO and the ACHP, pursuant to 36 CFR Part 800.14(c)(1). This list can be expanded by mutual agreement of the PA signatories.

Table 5-1, taken from Appendix C of the PA, provides a list of categories determined to have no adverse effect on existing or future listed or eligible historic properties (e.g., facilities). If the proposed action falls into one or more of these categories, KSC may proceed with their proposed project without public notification or consultation with the SHPO and/or the ACHP. The PA serves as the master agreement document for all undertakings that affect historic properties; no other MOAs or PAs are necessary for historic properties.

The KSC Environmental Checklist serves as a record of all undertakings. Each January, the HPO provides a yearly report to the SHPO on cultural resource activities that have occurred at KSC during the previous year. The report is broken into four sections: (1) those undertakings that were consulted with the SHPO and determined to have an Adverse Effect; (2) those that were excluded from consultation per the PA; (3) HABS/HAER recordation efforts completed or ongoing; and (4) ground disturbing activities performed at KSC that were not consulted with the SHPO.

5.3.3 Section 111

KSC has established procedures for leasing historic properties in KDP-KSC-P-1295 **(Figure 1-5)**. Real property agreements, as provided for in Section 111 of the NHPA, have been put in place for public stakeholders to occupy some of KSC's historic properties. For example, the O&C High Bay Facility is used by Lockheed Martin, under a lease agreement, to process the Orion vehicle for the SLS Program. KSC has leased 69 ha (170 ac) to the State of Florida for development of Exploration Park, a research site for aerospace contractors, universities, cyber security firms, and others conducting research in life sciences, clean energy, spacecraft fabrication, and other high-tech fields. Boeing, through Space Florida, has a 15 year lease agreement for OPF-3 for the manufacture and testing of the CST-100 spacecraft. A Commercial Space Launch Act (CSLA) agreement between NASA and Space Exploration Technologies (SpaceX) provides access to Launch Complex 39A to SpaceX in support of their commercial launch service programs.

In a February 10, 2014 statement before the Subcommittee on Government Operations Committee on Oversight and Government Reform, Center Director Robert Cabana discussed NASA's management of KSC Real Property holdings and commitment to streamline capabilities and reduce infrastructure. KSC actively pursues partnerships to maximize utilization of its launch infrastructure and facility commercial space operations. As facilities are determined to be excess to the Agency's needs, potential outside interest is assessed. The historical significance of each facility is a consideration in the processing of real property agreements, which include EULs, Use Permits, MOUs, MOA easements, and Space Act Agreements.

RELEASED - Printed documents may be obsolete; validate prior to use.

Table 5-1. NASA KSC Actions That Do Not Require Section 106 Consultation under the PA.

Antiterrorism and Force Protection Measures	Antiterrorism and force protection measures designed and constructed to prevent or mitigate hostile actions, including cyber threats, as well as to increase capacity and protection for access control, provided such construction does not alter or detract from the qualities that contribute to the significance of the historic property and/or structure. Any ground disturbing activities proposed shall comply with Stipulation VI.
Building Maintenance and Repair	General maintenance and repair of buildings and facilities, which includes, but is not limited to, painting, siding, roofing, door, ceiling, wall, window, floor covering repair/replacement, elevator repair, filter and light replacement, and repairs to existing equipment. If historic fabric must be replaced, it should be in-kind and match as practicable to the configuration, material, size, detail, and construction of the historic fabric as called for in the Secretary of the Interior's Standards for Rehabilitation.`
Building Removal	Demolition of buildings, structures, or facilities that are either not listed on or eligible in Appendix B or do not contribute to the significance of those historic properties, whether or not they lie within a historic district.
Electrical	Maintenance, repair, removal, modification, upgrading, or replacement of plant and building electrical systems (e.g., building conduit, wiring and lighting, emergency lighting, etc.) in all NASA KSC buildings and structures. Upgrading or additional new electrical lines between or among buildings within historic districts listed or determined eligible on the NRHP under Criteria A, B, or D.
Energy Conservation	Energy conservation measures, including installation, replacement, or modifications to the heating, ventilation, and air condition control systems and conversions to alternative fuels, provided that these elements do not detract from the qualities that make the historic property listed or determined eligible.
Erosion Control	Erosion control activities, such as gravel or riprap placement on slopes, planting or seeding ground cover, or cleanout of existing drainage ditches.
Facility Removal or Replacement	Removal or replacement of existing nonhistoric equipment or facility components where the equipment or component itself is not a feature that contributes to the historic significance of the historic property(ies) identified in Appendix B.
Fencing	Maintenance of existing fencing and installation of a new chain-link or post and rail fencing.
Fire Detection and Suppression	Changes to fire detection and suppression systems, including routine upgrades and modifications to fire alarm systems, smoke detectors, and sprinkler systems.
Green Building Technologies	Incorporation of green building technologies to existing buildings seeking certification under the U.S. Green Building Council's Leadership in Energy and Environmental Design standards for environmentally sustainable construction, provided such construction does not alter or detract from the qualities that contribute to the significance of the historic property(ies).
Health and Safety	Health and safety activities, including cleanup, encapsulation, and removal and disposal of asbestos-containing materials and lead paint from buildings and structures.
Hurricane Modifications	Modifications necessary to comply with hurricane codes provided the changes do not alter or detract from the qualities that contribute to the significance of the historic property(ies).
Landscaping	Landscaping, including mowing and trimming of grass, shrubs, or trees and routine vegetation already covered under control activities.

RELEASED - Printed documents may be obsolete; validate prior to use.

Table 5-1. NASA KSC Actions That Do Not Require Section 106 Consultation under the PA (cont.).

Lighting	Changes to interior and exterior lighting systems, including replacement of, or modification to, lighting systems in all buildings and facilities.
New Building Construction	New construction within historic districts listed or determined eligible for listing on the NRHP under Criteria A and B, provided such new construction does not directly impact or alter contributing resources as called for in the Secretary of the Interior's Standards for Rehabilitation.
Parking	Parking lot maintenance and repair of existing lots. Temporary parking or placement of mobile homes, tents, and portable structures on extant parking lots or other surfaces that does not require new ground disturbance.
Retrofitting	May include siting, installation, maintenance, repair, removal, or replacement of communications and computer systems, including public address systems, facsimile systems, microwave and radio systems, fiber optic cables, and phone systems.
Roads	Routine road maintenance and resurfacing where work is confined to previously maintained surfaces, ditches, culverts, and cut and fill slopes where there are no known historic properties or where properties would not be affected, because proposed work is clearly within disturbed context. Also included are paving extant roads or parking lots, or placing marl or shell on dirt roads or lots; small-scale road, sidewalk, and parking lot repair; and adding rock fill or gravel to roads where no new ground disturbance will occur.
Signage	Placement of signage and public interpretation, including the use of interpretive signs or exhibit structures that do not visually intrude on the historic property(ies).
Temporary Facilities	Construction or siting of temporary structures and sheds that does not physically affect historically significant properties or involve new ground disturbance.
Transfer of Real Estate	Transfer of ownership or management responsibilities of real property, including those listed or determined eligible in Appendix B, to be managed by another federal agency with equal responsibility for complying with Sections 106 and 110 of the NHPA.
Water Systems	Changes to water systems, including siting, installation, maintenance, repair, removal, and operation of plant water systems that include, but are not limited to, water wells, cooling water systems, potable water systems, storm sewers, waste water treatment systems, plant drainage, and plumbing.

RELEASED - Printed documents may be obsolete; validate prior to use.

5.4 ARPA COMPLIANCE

ARPA prohibits digging in or removal of artifacts from archaeological sites on federal land and makes such actions a felony offense. Artifacts removed and the vehicles and equipment used in connection with a violation are subject to forfeiture. KSC will actively ensure compliance with ARPA and will advise all staff and contractors against illegal collection of cultural materials and of the penalties for such collection imposed by the Act. Environmental checklist, excavation permit, and site plan review responses include instructions to stop work immediately and contact the KSC HPO if any archaeological material is found during land disturbing activities. An example of inadvertent discovery occurred in July 2009, when a contractor digging a stormwater pond for the Florida Power and Light (FPL) solar power site on KSC uncovered a bone. Work was stopped and the HPO and SHPO were both contacted. The fossilized bone was identified as a lower front leg bone from an extinct species of llama. This research and identification was conducted by Mr. Thomas Penders, Principal Investigator, Indian River Anthropological Society, and the Department of Vertebrate Paleontology, Florida Museum of Natural Natural History in Gainesville, Florida.

Appropriate measures will be developed, in cooperation with the FWS, for the protection of archaeological resources from looting and vandalism and for protection under ARPA. ARPA permits are required for all research that is **not** performed on behalf of, and under the direct supervision of the HPO, as part of a Section 106 undertaking. Section 4(a) of ARPA allows issuance of research permits to outside parties "to excavate or remove any archaeological resource" located on public or Indian lands. To date, KSC has had no ARPA violations. The HPO will work with the MINWR law enforcement officers to document suspected ARPA violations at KSC. In coordination with FWS-MINWR law enforcement, notices may be posted at KSC informing employees of these ARPA provisions and the felony penalties to which violators are subject.

ARPA Reporting: In January of each calendar year, the HPO responds to an ARPA Data Call from the FPO. The HPO prepares an annual report summarizing their archaeological activities completed during the past fiscal year. The Center response is submitted to the FPO. It is combined with similar reports from the other NASA Centers to make NASA's annual archaeological submittal, in accordance with ARPA. KSC's ARPA Report for 2013 is provided in **CRM NETS Module.**

5.5 NAGPRA COMPLIANCE

Under NAGPRA, and its implementing regulations 43 CFR Part 10, KSC is required to inventory Native American human remains and associated funerary objects and develop written summaries for unassociated funerary objects, sacred objects, and objects of cultural patrimony that are in the collections they own or control. An inventory and assessment of archaeological collections at KSC indicated that no Native American human remains or associated funerary objects are in the possession or control of KSC (ACI 1998b). Human remains from seven archaeological sites located at KSC are in the collections of the **Florida Museum of Natural History (FLMNH)** and the NPS's SEAC in Tallahassee. These holdings are listed in **Table 5-2**. Both SEAC and the FLMNH have possession and control of these cultural materials and include them in their respective NAGPRA inventories. A report stipulating the absence of NAGPRA-regulated cultural materials at KSC previously was prepared and forwarded to the Departmental Consulting Archaeologist for the NPS, Washington, D.C.

For future archaeological survey and excavation projects performed as part of a KSC undertaking, the SOW prepared by the HPO will stipulate that **no human remains shall be disturbed or collected**. The presence of human remains shall be recorded in the field notes and the remains respectfully covered and left in place. No future collections from KSC archaeological sites shall include human remains. Procedures to follow in the case of an inadvertent discovery of human remains are provided in **Chapter 6, SOP #6.**

RELEASED - Printed documents may be obsolete; validate prior to use.

Table 5-2. NAGPRA Inventory for all KSC Archaeological Collections.

Site No.	Collector	Acc. No./Cat. No./Inventory
FLMNH		
8BR141	G. Long, 1965	Acc. No. 4595/ Cat. No. 103728/6 pcs. human remains
8VO131	Bullen, Bullen, and Bryant, 1967	Acc. No. 4388/ Cat. No. 98344-98388; 98396-98442/ human remains (MNI* = 81)
SEAC		
8BR77	J. Ehrenhard, 1976	Acc. No. 191/Cat. No. CANA 000092/15 pcs. human remains (MNI = 1)
8BR142	J. Ehrenhard, 1976	Acc. No. 191/Cat. No. CANA 000061 and 000094/ 5 pcs. human remains (MNI = 2)
8BR145	J. Ehrenhard, 1976	Acc. No. 191/Cat. No. CANA 000028/ 10 pcs. human remains (MNI = 1)
8VO129	J. Ehrenhard, 1976	Acc. No. 191/Cat. No. CANA 000007/ 3 pcs. human remains (MNI = 1)
8VO130	J. Ehrenhard, 1976	Acc. No. 01000/ 16 pcs. human remains
8VO131	J. Ehrenhard, 1976	Acc. No. 921/ Cat. No. CANA 000105/ 5 pcs. human remains (MNI = 1)
8VO131	Unknown (looter)	Acc. No. 01001/ Cat. No. CANA 000104/ 5 pcs. human remains (MNI = 1)

* MNI= Minimum number of individuals.

RELEASED - Printed documents may be obsolete; validate prior to use.

5.6 36 CFR PART 79 (CURATION)

5.6.1 Existing Collections

As part of its mandate under federal historic preservation laws and regulations, KSC has a responsibility to ensure that archaeological collections, including material remains (i.e., artifacts, objects, specimens, and other physical evidence that are excavated or removed) and associated documentation, are managed and preserved, in accordance with the regulations set forth in 36 CFR Part 79 (Curation of Federally-Owned and Administered Collections). All artifacts, field notes and maps, and data generated or collected during a survey or excavation project on NASA-owned land, whether conducted by a contractor or cooperating federal agency, **shall be the property of KSC**.

Between June 1997 and November 2009, KSC with the support of ACI, undertook an inventory of existing archaeological collections from sites at KSC and also conducted a curation needs assessment (ACI 1998b). The KSC existing site collections were derived from archaeological surveys and excavations conducted since the 1960s.

The 1998 study indicated that archaeological collections from KSC sites were curated or stored at three locations: the NPS's **SEAC** in Tallahassee, the **FLMNH** in Gainesville, and the **Florida Bureau of Archaeological Research (BAR)** in Tallahassee. At that time, the majority of artifacts, derived from Phase II and III excavations at the Opposite Futch Cove Site (**8BR170**) were stored at SEAC through CNS agreement documents. The FLMNH accounted for only a small percentage of the overall collection. Volumes of collections housed at each repository are provided in **Table 5-3**. The collections at both the BAR and FLMNH are owned and controlled by these institutions. In the absence of a NASA-dedicated curatorial facility, archaeologists who conducted previous surveys at KSC sites turned their small collections over to these repositories. In this way, the artifacts recovered from KSC archaeological sites became part of the permanent collections of the BAR and the FLMNH.

SEAC's collection (Accession Nos. SEAC-191, -835, -963) as of 1998 was derived from 17 KSC sites, totaling .07 m^3 (2.5 ft^3). The sites that yielded these cultural materials are located in the area managed by NPS-CANA and were mostly collected as the result of surveys performed by SEAC archaeologists.

A table detailing KSC archaeological site collections, originally prepared in 1998 and updated in 2008, is contained in **Appendix F**. The table includes the FMSF number, the collector/donor for each collection, name and repository location, relevant accession and/or catalog numbers, description of each collection, and the approximate size. These data are summarized in **Table 5-3**.

Table 5-3. Locations and Volume of Archaeological Collections from Sites at KSC.

Repository	Total Sites	Cubic m/ft
BAR	8	.03/1.0
FLMNH	23	.07/2.5
SEAC (pre-2001)	17	.07/2.5
SEAC (2001)		
8BR170 Phase II and III	1	*1.2/44.0
ACI 1990-1992 Surveys	39	*.06/2.0
ACI 1996 Surveys	27	*.08/3.0
Totals	115	1.5/55.0

*Measurements are rough estimates made in 1998; they do not accurately reflect the actual volume.

Based upon the findings of the 1998 assessment study, in late 2001**,** KSC artifacts were transferred to SEAC as the repository for permanent curation of its archaeological collections through CNS loan agreement documents. This facility meets the federal curation standards contained in **36 CFR Part 79**. In accordance with Section 79.6(b) of the regulations, the SEAC repository is located in Florida and currently stores and maintains other collections from the same sites or location, or similar geographical region or cultural area.

The collection from KSC has not been subdivided, in order to maintain its integrity and research value. In November 2001, SEAC personnel retrieved 64 boxes of artifacts from KSC and transported them to SEAC for cataloging and rehousing, funded by NASA. Approximately 45,000 objects were processed during this period. Collections are currently on loan from NASA to the NPS CNS for long-term curatorial care and storage and then, in turn, on loan from CNS to SEAC**.** Formally, the original initiation date of the loan agreement between NASA KSC and the CNS was November 1, 2001; the termination date was November 1, 2003. Since then, the loan has been extended three times, each for a period of three years. **The current loan agreement was extended to July 10, 2015.** As a condition of the loan agreement, collections must be transported by motor vehicle from KSC to the NPS. The loan agreements for

RELEASED - Printed documents may be obsolete; validate prior to use.

Accession Nos. CANA-00096, CANA-00097, and CANA-00098 are provided in **Exhibit 5-4.**

KSC's Point of Contact (POC) at SEAC is Richard Vernon, Supervisory Museum Specialist, 850-580-3011, or Richard_Vernon@nps.gov.

The 45,000-object collection at SEAC is divided into three accessioned collections, as summarized in **Table 5-4**. The collections are derived from 77 archaeological sites, investigated by SEAC personnel (Brewer 1991a, 1991b; Bryne 1989a, 1989b; Ehrenhard 1976), as well as KSC contractors (ACI 1991, 1992, 1996a, 1996b; Johnson 1992; Ste. Claire and Johnson 1988). Curated materials include, but are not limited to, aboriginal and historic ceramics, shell tools and shell food remains, animal bone, lithics, and soil and flotation samples. Before the addition of the three collections listed in **Table 5.4**, the volume of catalogued materials from KSC was approximately .07 m^3 (2.5 ft^3). Associated documentation, including original field records, maps, and photographs, are generally complete and kept in a separate climate-controlled room. The additions made in 2001 represent approximately 1.9 m^3 (67 ft^3), of which about 1.8 m^3 (62 ft^3) is derived from the Phase II and Phase III excavations at the Opposite Futch Cove Site (8BR170). Approximately .3 linear m (1 linear ft) of associated records accompanied the three collections.

The NAGPRA Section 5 inventory prepared by SEAC includes culturally unaffiliated human remains from five KSC sites: Nauman's Place (**8BR77**), Butler Campbell's Mound (**8BR142**), Clark Slough (**8BR145**), Ross Hammock Midden (**8VO130**), and the Ross Hammock Burial Mounds (**8VO131**) (ACI 1998b:6).

Table 5-4. Summary of KSC Collections at SEAC.

Box Nos.	Accession Nos., Provenience, and General Contents
1-60	CANA Acc. No. 96 SEAC Acc. No. 1743 Phase III Excavation, 8BR170, 1988 7,574 lots; 173,866 objects
61 and 62	CANA Acc. No. 97 SEAC Acc. No. 1744 Survey of KSC Option Areas 1, 2, and 3, 1991-1992 462 lots; 1961 objects
63 and 64	CANA Acc. No. 98 SEAC Acc. No. 1745 Survey of KSC North Area, 1996 941 lots; 7281 objects

In 2006, selected archaeobotanical and archaeofaunal samples from **8BR170**, part of SEAC Accession No. 1743, were temporarily removed and analyzed, cataloged, and curated to NPS standards by scientists at the FLMNH (Ruhl et al. 2006).

The **FLMNH** curates collections from **23** KSC sites (**Appendix F).** The majority of these collections were made by George Long in the mid-1960s (Long 1967). Other collections are derived from site surveys conducted by Pat McMullen (Long 1967) and from excavation at the Ross Hammock Site complex (Bullen et al. 1967). The curated artifact collections include aboriginal and historic ceramics, shell tools, historic glass and metal, lithics, animal bone, and human remains. All have been cleaned, labeled, and archivally processed. Containers include non-acidic boxes of various sizes and archival-quality plastic bags. These are placed on open metal trays within metal cabinets. The condition of these collections (as of 1998 inspection) is excellent. Exclusive of the materials from Ross Hammock, the volume of collections curated at the FLMNH measures approximately .07 m^3 (2.5 ft^3). Associated records are kept in a separate documents room and indexed by accession number. Museum catalog cards contain site specific information including the investigator, date of work, number and types of artifacts, and in most cases, the volume (in cubic meters/feet) of the collections.

The NAGPRA Section 5 inventory prepared by the FLMNH indicates that culturally unaffiliated human remains from two KSC sites, Onion Island **(8BR141)** and Ross Hammock Mound 1 **(8VO131A)** are housed here. The latter site collection contains the

RELEASED - Printed documents may be obsolete; validate prior to use.

partial remains of 81 individuals. Accession and catalog numbers are noted in **Table 5-2.**

The POC at the FLMNH is Registrar Elise LeCompte. She can be reached at 352-273-1925, or lecompte@flmnh.ufl.edu.

The **BAR** curates collections from **eight** KSC sites, which collectively fit into a single cubic foot box. Among the sites are those investigated during the survey of MINWR (Griffin and Miller 1978). The collections consist of aboriginal and historic ceramics, historic metal and glass, shell tools, and lithics. No human remains or NAGPRA-related materials are included. All artifacts have been cleaned and some have been individually labeled. Secondary containers are 2- and 4-mil, plastic zip lock bags labeled in indelible ink. Primary containers are acidic cardboard boxes labeled directly on the box with the site and accession numbers. The collections were reported in excellent condition (in 1998). There are no associated records, with the exception of a Field Specimen (FS) Log provided by a single collector/donor. Accession files are included in the BAR's computerized database.

The POC at the BAR, Collections and Conservation, is Dr. Dave Dickel. He can be reached at (850)245-6322, or DDickel@dos.state.fl.us.

5.6.2 New Collections

All collections made from archaeological sites at KSC are the property of NASA. It is the responsibility of all contractors and researchers to provide the HPO with all artifacts and other data generated and collected, in addition to all associated records. The submittal of these collections shall be made within **30 days** of delivery of the final report. It is the responsibility of the HPO to ensure that language requiring the submittal of artifacts and associated records be incorporated into all SOWs for archaeological survey and excavation projects initiated by KSC. SOPs for archaeological collections are provided in **Chapter 6, SOP #10.**

5.7 EO 13287: PRESERVE AMERICA

5.7.1 Section 3 Reporting

The Preserve America Section 3 Report under EO 13287 is NASA's "report card" for compliance with Section 110 of the NHPA. NASA prepared its first Agency-wide status report in 2004, which included baseline information on NASA's CRM Program. The first progress report was submitted to the ACHP and the Secretary of the Interior by the FPO in 2005. Subsequent reports are prepared and submitted triennially and can be found in the CRM NETS Module.

The information contained in the Section 3 Report is used to determine Agency progress since the last report. It covers such areas as policy development and implementation, program goals, use of partnerships, challenges and successes, and opportunities.

Approximately seven months before the Final Section 3 Report is submitted, the FPO issues a data call to all NASA Centers. CRM activity data reported by Centers is entered through the CRM NETS Module and is then used in compiling the Agency triennial report to ACHP and the Secretary of the Interior, see Section 3.8 and Chapter 6, SOP #13 for more details.

Given the time required to prepare the responses and to gather supporting documentation, the HPO will update relevant CRM records on a yearly basis, in order to be prepared for the next triennial report.

5.7.2 Heritage Tourism

The use of historic properties to enhance community economic development through heritage tourism is emphasized in EO 13287, Preserve America. **Heritage tourism** is defined as "*the business and practice of attracting and accommodating visitors to a place or area based especially on the unique or special aspects of that locale's history, landscape (including trail systems), and culture"* (Section 5(b)).

Most of KSC's historic properties are in operational use and are located in restricted access areas. Therefore, they are not available for use in heritage tourism, because of safety and security access that limits the use of KSC's historic properties for public tours and on-site interpretation.

Located just outside the restricted access area, the KSC Visitor Complex is one of the most popular tourist destinations in Florida, affording 1.5 million visitors annually the opportunity to learn about the U.S. Space Program. Operated since 1995 by Delaware North Companies Parks & Resorts on behalf of NASA, the Complex contains educational exhibits, displays of space artifacts and models,

RELEASED - Printed documents may be obsolete; validate prior to use.

astronaut memorabilia, IMAX 3-D film theaters, and a rocket garden. The new Space Shuttle Atlantis exhibit allows visitors to stand "nose-to-nose" with the orbiter Atlantis, while the Shuttle Launch Experience simulates a launch aboard the Atlantis. A bus tour to part of the restricted area is also offered to the public. The tour includes a view of launch and landing facilities and stops at the Apollo/Saturn V Center. Up close and personal tours include Firing Room 4 in the LCC, Cape Canaveral (Mercury and Gemini launch sites, launch bunkers, and active rocket programs), and KSC (launch countdown clock, and SLF). Also at the Visitor Complex is the Astronaut Memorial honoring men and women who have given their lives for space exploration. The U.S. Astronaut Hall of Fame, located just across the Indian River to the west, is another stop for visitors. It contains displays dedicated to U.S. astronauts, including a large collection of personal memorabilia. The funds generated from visitors have helped to support the restoration and maintenance of historic artifacts, including the display of the original Mission Control Center consoles in the Early Space Exploration exhibit.

Future opportunities for heritage tourism may include "virtual tourism," which employs 3-D visualizations of a historic property, accessible via the Internet, as an alternative to on-site public access.

5.8 TREATMENT AND MITIGATION MEASURES FOR HISTORIC PROPERTIES

Most NASA-controlled facilities at KSC that are NRHP-listed or eligible (**Appendix E**) are in active use, abandoned, leased to commercial or governmental entities, or slated for demolition. Although the operational needs of the Space Shuttle Program resulted in structural changes to most of these significant structures and buildings, they retain their historical associations with the Apollo-era Manned Lunar Landing Program, as well as their significant engineering values. Additional modifications to some of these facilities are occurring to support SLS and commercial endeavors. A great deal of latitude is afforded in the modification of such highly technical and scientific facilities to accommodate NASA's ongoing mission (ACHP 1991). Few facilities will undergo modification to such an extent that all significance is lost. At the very least, their association with the advancement of space exploration will never be lost, unless demolished, dismantled, or moved. KSC needs to be able to take the actions necessary to maintain, modify, upgrade, and rehabilitate its facilities in order to carry out its mission. At the same time, as a federal agency, NASA has a responsibility under the NHPA to safeguard the public interest in the history of the U.S. Space Program. Therefore, this section of the ICRMP sets forth the appropriate treatment and mitigation strategies for KSC's significant historic properties, in conformance with applicable federal standards and guidelines.

The HPO will review all KSC Environmental Checklists that impact historic properties. While general maintenance and minor modifications is allowed under the PA, if major modifications are needed, the project will be reviewed and approved by a Facilities Board, in coordination with the HPO. The maintenance/repair/alteration methods selected will be those that most effectively preserve the historic, scientific, engineering, and architectural values of the facility, consistent with the Secretary of the Interior's Standards for Rehabilitation (**Exhibit 5-5**).

Under the PA, those undertakings involving facilities not individually NRHP-listed, eligible, or contributing to a historic district **may** proceed without SHPO consultation, after the project is evaluated by the HPO. Additionally, exclusive of the exceptions noted, the actions described in **Table 5-1** shall be considered categorically excluded from the Section 106 process, since they have little or no potential to adversely affect the qualities that contribute to the significance of the historic properties.

5.8.1 Condition Assessments

A team from NASA Headquarters performs an annual condition assessment (Deferred Maintenance Assessment) of all facilities. Each is rated on the Facility Condition Index using a scale of 1 through 5, with 5 being Excellent condition and 1 being Very Poor condition. Another more detailed facility assessment is conducted every 5 years under the Institutional Services Contract. The facility manager does not do an annual assessment on all facilities independently from these, but is involved in both.

It is the intent of KSC to monitor, maintain and improve the condition of its historic properties and to promote their rehabilitation and adaptive reuse to the extent feasible. Towards this end, a yearly condition assessment will be made by the facility manager of each NRHP-listed and eligible historic property,

RELEASED - Printed documents may be obsolete; validate prior to use.

including all contributing resources within historic districts.

5.8.2 Treatment Strategies

The Secretary of the Interior's Standards for the Treatment of Historic Properties provide standards and guidelines for the preservation, rehabilitation, restoration, and reconstruction of historic properties. With the exception of preservation, these treatments are generally not applicable to KSC historic properties.

In accordance with 36 CFR Part 68 **preservation** is defined as "*the act or process of applying measures necessary to sustain the existing form, integrity and materials of a historic property.*" It includes the ongoing maintenance and repair of historic materials and features rather than extensive replacement and new construction. The limited and sensitive upgrading of mechanical, electrical, and plumbing systems and other code-required work to make the properties functional is appropriate.

For historic properties no longer needed to support the Agency's mission, avoidance of adverse impacts and preservation should be the first consideration. Unoccupied and abandoned historic properties are a challenge for NASA to preserve given its limited resources. The decision to retain a historic property in its original place should take into account the following:

- Does the preservation of the historic property meet the Agency's goals and objectives?
- What will preservation accomplish?
- What is the cost of maintaining the property in a safe condition?
- Are there factors such as hazardous materials contamination that would make preservation unfeasible?
- Is the historic facility structurally sound?
- Does the historic property have educational or interpretive value? Is it suitable as a heritage tourism site, given its location?

When a historic property is identified as no longer needed to support NASA missions and is removed from active use (mothballed), if feasible, routine maintenance and repair to protect it from deterioration will be the minimal level of treatment to avoid adverse effects. **Maintenance** is defined as "*the act of removing a resource from active use and protecting it from deterioration*." **Repair** is "*the act of fixing an element of the resource that has deteriorated or is broken*." To avoid adverse effects, facility maintenance and repair activities, including cleaning and **replacing in-kind**, must comply with the Secretary of the Interior's Standards for Rehabilitation (**Exhibit 5-5**). **If maintenance is reduced or withdrawn from a NRHP-listed or eligible property, including resources that contribute to a historic district, such neglect may cause deterioration, which is considered an adverse effect (36 CFR Part 800.5(2) (vi)).**

The replacement of building materials with **non-compatible materials**, additions to NRHP-listed or eligible properties, **significant changes to floor plans**, as well as **partial demolition** are considered **alterations**. These actions have the potential to cause an adverse effect and cannot be undertaken without consultation with the SHPO and the ACHP, where appropriate. To lessen the potential for adverse effects and to facilitate the Section 106 review process, any specifications for significant changes including replacement of features or additions to buildings or structures, should follow these general guidelines:

- Massing and volume shall be consistent with that of the original building or structure.
- Profiles (facade setbacks) shall be complimentary to the original building or structure.
- Fenestration (window treatments) shall be of similar openings and style to that of the original.
- Materials, units, and assemblies shall be of similar color, texture, and style to those used in the original.

Emergency Situations: Unanticipated events such as floods, fires, and hurricanes may result in alterations of the structural stability of a historic property. In such cases, where the historic property is rendered an immediate health and safety hazard, KSC will take necessary steps to make the property safe and secure. Emergency actions may include the limited replacement of irreparably damaged features or materials and temporary measures that prevent further loss of historic material or that correct unsafe conditions until permanent repairs can be made. Within 10 days, or as soon as practicable, the HPO will notify the SHPO of such actions, providing a brief description of the nature of the emergency and the corrective work.

RELEASED - Printed documents may be obsolete; validate prior to use.

An example for KSC is the damage caused to the LC-39A flame trench during STS-124. The HPO informed the SHPO that an investigation board would determine the appropriate method of repair. In follow-up, the HPO notified the SHPO that a repair method had been selected and the emergency repairs made. The SHPO concurred with the repairs.

5.8.3 Mitigation Measures

The following undertakings involving NRHP-listed or eligible historic properties are considered adverse effects and will require the implementation of mitigation measures determined in consultation with the SHPO and ACHP, in accordance with Section 106 of the NHPA:

- Demolition and dismantlement, including the physical destruction of, or damage to all or part of the historic property.
- Alterations including, but not limited to, the replacement of building materials with non-compatible materials, and additions to historic properties; removal or excessing of historically significant elements/equipment; significant changes to floor plans; and partial demolition.
- New construction within or proximate to the boundaries of the historic property where such new construction adversely affects those qualities that make the property significant, including creating a visually intrusive element, or is of non-compatible design and placement.
- Repair and maintenance, if such actions result in a change in the existing structural integrity, operational function, or visual integrity of the historic property.
- Neglect, including the reduction or withdrawal of maintenance, resulting in the deterioration of historically significant elements.
- Transfer, sale, or lease of the historic property to another agency or non-federal entity without appropriate and enforceable preservation covenants.
- Removal of the historic property from its historic setting.
- 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 type and level of mitigation is generally negotiated on a case-by-case basis with the SHPO and agreed upon measures are formalized as stipulations under an MOA. **An MOA for each individual undertaking is no longer necessary due to the execution of the PA for Management of Historic Properties, dated May 18, 2009 (Exhibit 3-12).** During the mitigation process, all characteristics of a historic property that qualify it for inclusion in the NRHP must be considered.

NASA, as a rule, does not have the authority to directly transfer or dispose of facilities. Rather, NASA uses the General Services Administration (GSA) as the formal transferor. Transfer of a historic property between federal agencies (e.g., NASA and the Air Force) is not an adverse effect, per se. However, the potential adverse effects should be considered before the transfer.

5.8.4 Specific Mitigation Options

A variety of mitigation measures may be implemented by KSC to preserve important information about facilities and structures that must be altered or demolished. Many of these options are presented in the ACHP's *Consideration of Highly Technical and Scientific Facilities in the Section 106 Process* (1995:9-11) and all are consistent with the KSC 2009 PA. The primary mitigation options include recordation in accordance with the NPS's Heritage Documentation Programs (HABS/HAER/ HALS), salvage, public interpretation, offsite mitigation, and adaptive reuse. A discussion of each follows.

Historic American Building Survey/Historic American Engineering Record/Historic American Landscapes Survey (HABS/HAER/HALS) Documentation: At a minimum, for most undertakings, which involve modification to or demolition of significant historic properties, the adverse effects of such modification will be mitigated by means of **documentation** of the property to HABS/HAER standards, in accordance with the Secretary of the Interior's Standards for Architectural and Engineering Documentation, as originally published in the Federal Register (FR), 48 FR 190:44731-44734, September 29, 1983. The Guidelines were revised (effective April 1, 2003) in 68 FR 139:43159-43162. The goal of these Heritage Documentation Programs of the NPS is to create a permanent record of the historical, architectural, technological, or cultural significance of a historic

RELEASED - Printed documents may be obsolete; validate prior to use.

property. This record is placed on permanent deposit at the Library of Congress. In cases where the historic property will be demolished, the HABS/HAER documentation provides access to information that otherwise would be lost. Recordation materials subject to Export Control and the International Traffic in Arms Regulations (ITAR) (22 CFR Part 120-130) will be distributed to a publicly-accessible repository capable of managing classified or other secure materials such as the National Archives and Records Administration (NARA).

If there are **multiple assets** of a specific property type (e.g., three MLPs, two Payload Canisters, two Crawler Transporters, two Launch Pads) that are 95 percent identical, KSC shall provide recordation of only one of the assets as part of the mitigation for all assets as fulfillment of the Section 106 obligations.

Three levels of documentation are included in the Secretary's standards. These were devised to aid in the documentation of specific significant resources. The level of documentation should be appropriate to the nature and significance of the building, site, structure, object, or district being documented and will be determined in consultation with the SHPO. Thus, innovative structural and mechanical systems, as well as architectural features, are a typical focus of documentation where such equipment, rather than the "shell" of the building, is the character-defining element vis-a-vis NRHP eligibility. The documentation level selected derives from a consideration of both why the historic property is considered significant, as well as the management needs for which the documentation is being performed.

Documentation consists of measured drawings, perspective-corrected photographs, and a written narrative. It provides a detailed and comprehensive record of the property's significance. The documentation must reflect all events, features, and values that qualify the property for listing in the NRHP. In accordance with the NPS requirements, the written data must be printed on acid-free paper. Photos and negatives must be archivally processed and printed on non-resin-coated paper and safety film, respectively. Completed documents are filed with the NPS Library of Congress and SHPO.

Other media, such as films of industrial processes, can be used to document historic properties. The NPS Southeast Regional Office in Atlanta shall be contacted before such recording. The POC is Bethany Serafine, Historian, Southeast Region. She can be reached at 404-507-5788, or at Bethany_Serafine@nps.gov.

The primary use and content requirements for each of the levels of documentation are as follows:

Documentation Level I:

Use: Primarily used for nationally significant buildings and structures, defined as NHLs, and occasionally for NRHP-listed or eligible resources depending on the reason for mitigation.

Content: Drawings: A full set of measured drawings depicting existing or historic conditions.
Photographs: Photographs with large-format negatives of exterior and interior views; photocopies with large-format negatives of select, existing drawings or historic views that are produced in accordance with the U.S. Copyright Act, as amended.
Written data: History and description

Documentation Level II:

Use: Primarily for most NRHP-listed or eligible resources, but depends on the reason for mitigation.

Content: Drawings: Selected existing drawings, where available, may be photographed with large-format negatives or photographically reproduced on Mylar, in accordance with the U.S. Copyright Act, as amended**. This differs from Level I by substituting copies of existing drawings for measured drawings. Photocopies must be free of copyrights. If existing drawings are housed and preserved in accessible archives, their reproduction may not be necessary.**
Photographs: Photographs with large-format negatives of exterior and interior views, or historic views where available and produced in accordance with the U.S. Copyright Act, as amended.
Written data: History and description.

RELEASED - Printed documents may be obsolete; validate prior to use.

Documentation Level III:

Use: Primarily used for minor elements of a historic district.

Content: Drawings: Sketch plan
Photographs: Photographs with large-format negatives of exterior and interior views
Written data: Short form for historical reports

The NPS guidelines and standards also include general materials and presentation requirements for HABS/HAER/HALS documentation, as follows:

Measured Drawings:

- Ink on translucent material, such as Mylar
- Three sizes: 19" x 24", 24" x 36", or 34" x 44"
- Lettered mechanically or in a hand-printed equivalent style
- Include adequate dimensions on all sheets

Large-format Black and White (B&W) Photographs:

- One print per negative
- Negatives on safety film only
- Prints on fiber paper; no resin-coated paper
- Three sizes: 4" x 5", 5" x 7", or 8" x 10"
- **Level I** photos must include duplicate photos with a scale; **Level II** and **III** photos must include, at a minimum, at least one photo with a scale, usually of the principal façade.

Written History and Description:

- Archival 8½" x 11 bond paper
- Typewritten or laser printed
- Follow accepted rules of grammar

Salvage: Architectural or scientific/engineering elements from KSC's historic properties will be salvaged, where feasible. Prior to commencing any activities, a detailed mitigation proposal, including an illustration (drawings and/or photographs) of which elements are to be salvaged, shall be submitted by the HPO to the SHPO for review and approval. In cases of facility demolition, dismantlement, or removal of significant elements, KSC will apply its agreement with the Smithsonian Institution ("Agreement Between the National Aeronautics and Space Administration and the Smithsonian Institution Concerning the Transfer and Management of NASA Historical Artifacts, May 28, 1998" as set forth in NPR 4310.1A, dated August 20, 2008; **Exhibit 1-2**) to determine appropriate retention and curation activities with respect to significant artifacts. The agreement was extended five years on June 12, 2013 and expires on August 20, 2018.

Public Interpretation: A variety of initiatives may be undertaken to enhance the public's understanding of KSC's historic properties, including the following:

- Locate and archive copies of engineering and shop drawings for the historic facilities. These could be developed in consultation with HABS/HAER.
- Locate and archive photographs and video or movie footage of facilities at various stages of use over the years, or from selected scientific tests or research programs that relate to the "Man in Space" historic theme.
- Assemble collections of documents such as technical reports, annual reports, public relations press kits, etc., and donate to public libraries and schools.
- Prepare web-based products for educational purposes featuring the historic properties as part of the heritage of KSC.
- Conduct taped interviews and create oral histories from individuals associated with the U.S. Space Program, including long-term KSC employees. This information will, in part, contribute to a better public understanding of worker life and social history not available from other sources.
- Identify, collect, preserve, and display significant objects relating to the manned space programs, including astronaut memorabilia.
- Prominently display and describe the many scale models of historic structures, facilities, and hardware. These scale models were often constructed by the Agency or contractor who built the facility or equipment.

Offsite Mitigation: The following types of public education and outreach programs may be undertaken:

- Provide increased support for museums associated with scientific and technological institutions and additional on-site interpretation of historic sites. Under the provisions of the National Aeronautics and Space Act of 1958, NASA is charged with

RELEASED - Printed documents may be obsolete; validate prior to use.

development of public education and outreach programs. Some of these museums and visitor centers are small while others, such as those at KSC, attract over a million visitors each year.

- Encourage written popular and technical histories and other accounts.
- Increase support for the existing offices of agency historians and archivists and financially support the dissemination of historical documentation and official Agency histories, already available, but little known outside the Agency. Many federal agencies have on-staff official historians and/or archivists whose duties are to compile and provide historical information on the agency and to manage repositories of information generated by the agency in the past. Additionally, prominent agencies such as NASA, have been subjects of official and unofficial histories.
- Encourage increased private and public participation in an effort to preserve America's scientific and technological past.
- Integrate consideration for those significant structures and facilities that may be affected by an Agency project or program very early in mission planning.

Adaptive Reuse: While 71% of KSC's NRHP-listed and eligible historic properties are currently in active use, some have been taken out of service, vacated and safed from hazardous materials. Others have been altered and adaptively reused to serve similar functions in support of successive programs. Modifications have been made or are in progress for some of KSC's historic properties, such as the VAB, LCC, OPF-3, O&C, and Launch Complex 39, Pads A and B. Many of these facilities are being adapted for use by commercial crew and cargo programs and in support of NASA's SLS Program.

5.8.5 Property-specific Mitigation

For mitigation measures carried out in compliance with Section 106 of the NHPA, the specific mitigation measures for each property may vary, depending on the qualities that contribute to the significance of the historic property. For example, for properties eligible under Criterion C in the area of Architecture, proposed alterations to the exterior façade will need to be considered during SHPO consultation, whereas, for those properties significant in the area of Engineering, distinguished for their specialized interior equipment, modifications to the exterior building "shell" will not be important from a mitigation perspective. Similarly, computer consoles and specialized communications equipment may be character-defining features within historic properties eligible under Criterion A in the area of Communications. Thus, technological upgrades requiring the removal and replacement of such historic equipment must be addressed in the consultation process. For historic properties significant for their association to events important in the past (Criterion A), one or more "off-site" mitigation options, such as the collection and archiving of photos and written documents, may be more appropriate than extensive HABS/HAER documentation.

KSC's listed and eligible historic properties may be classified into five treatment categories based on their applicable significance criteria. These categories, along with suggested minimum treatment and mitigation measures, are as follows:

Category 1: Individually eligible under Criterion A only.

- HABS/HAER Level II documentation prior to removal or major alteration of significant historic equipment or features; change in function/use; abandonment, mothballing or demolition; or sale out of federal ownership.

Category 2: Contributing Resource to a Historic District eligible under Criterion A only; not individually eligible.

- HABS/HAER Level III documentation prior to removal or major alteration of significant historic equipment or features, change in function/use; abandonment, mothballing or demolition; or sale out of federal ownership.

Category 3: Individually eligible under Criteria A and C, where C is in the area of Architecture.

- HABS/HAER Level II documentation prior to removal or major alteration of significant historic equipment or features; change in function/use; abandonment, mothballing or demolition; or sale out of federal ownership.
- Salvage significant architectural features and retain them for historical purposes, for reuse, or for incorporation into other NASA programs.

RELEASED - Printed documents may be obsolete; validate prior to use.

- Alterations, modifications, and repairs to building exterior must follow the Secretary of the Interior's Standards for Rehabilitation.
- Avoid removal or alteration of character-defining features; treat and maintain.
- Repair rather than replace deteriorated historic features. If replacement is required, match the original in design, color, texture, and materials, where possible.
- Do not use chemical treatments, such as sand blasting, that could damage the historic materials.
- Minimize impacts to the exterior of the building.
- Adjacent or proximate new construction shall be of complimentary design and placement and should not create a visually intrusive element.
- If there is a change in use, changes to the character-defining features should be minimal.
- Flag and review all work orders and maintenance requests for possible impacts to character-defining features.

Category 4: Individually eligible under Criteria A and C, where C is in the area of Engineering.

- HABS/HAER Level II documentation prior to removal or major alteration of significant historic equipment or features; change in function/use; abandonment, mothballing or demolition; or sale out of federal ownership.
- Salvage significant scientific/engineering features and retain them for historical purposes, for reuse, or for incorporation into other NASA programs.
- Changes to the exterior façade of the building will not require any documentation measures.
- Avoid removal or alteration of character-defining features.
- Repair rather than replace deteriorated historic features.
- If there is a change in use, changes to the character-defining features should be minimal.

Category 5: Contributing Resource to a Historic District eligible under Criteria A and C, where C is in the area of Engineering; not individually eligible.

- HABS/HAER Level III documentation prior to major alteration, change in function, or demolition.
- Rehabilitate for a compatible new use, if feasible.
- Retain and repair historic materials that give historic character to the property.
- Replace deteriorated features.

No special mitigation measures are required for ineligible and noncontributing buildings, structures, and objects.

5.9 ARCHAEOLOGICAL SITE MANAGEMENT

5.9.1 Introduction

ARPA requires protection of significant archaeological sites on federal lands. This requirement is also extended, under the NHPA, to cultural resources that *might be affected* by federally licensed or assisted projects, activities, or programs.

Protection is defined as *"The act or process of applying measures designed to affect the physical condition of a property by defending or guarding it from deterioration, loss, or attack, or to cover or shield the property from danger or injury."*

Protection actions for archaeological sites may be necessary as the result of natural and/or human forces.

Natural forces that may result in the deterioration or loss of archaeological sites include, but are not limited to:

- wind and water erosion (e.g., from storms and floods)
- wildfires
- activity of wild animals (e.g., feral hogs)

Human forces that may affect significant archaeological sites include:

- **authorized actions** (formally approved projects, activities, or other undertakings)
- **illegal acts** (site looting and vandalism)

A variety of authorized actions may result in the deterioration, damage, or loss of archaeological resources at KSC. Examples include the following:

RELEASED - Printed documents may be obsolete; validate prior to use.

- **Agriculture:** Cultivation and maintenance of citrus groves including land clearing and grading, planting new trees, and tree or vegetation removal.
- **Mosquito Control:** Construction, maintenance and removal of dikes and impoundments, including the effects of inundation and coverage of archaeological sites under redeposited spoil.
- **Recreation:** Construction of visitors centers and displays, boat launches, restroom facilities, trail systems, and public access roads.
- **New Construction or Maintenance:** Construction and maintenance of operational and support facilities.
- **Fire Management:** Controlled burns and construction of fire breaks.
- **Wildlife habitat conservation:** Maintenance of wetlands and the installation of animal-control fencing or barriers.
- **Replacement of sewers and drains:** Excavation and trenching for utility ductwork modifications.
- **Erosion control measures:** Installation of silt fences, turbidity barriers, etc. to implement erosion control best management practices.

The HPO will implement protection procedures for all NRHP-listed and eligible archaeological sites. Within the non-operational areas of KSC, this responsibility will be shared with MINWR and CNS land managers.

5.9.2 Condition Assessments

During the 1990-1996 KSC-wide predictive model surveys, **31** archaeological sites were recommended for preservation and protection. One recorded site (**8BR2258**) was subsequently added to this list (See Appendix D, Recommendation Category 1). As part of these surveys, the condition of each site was evaluated in conformity with the NPS guidelines. As per these standards, site condition is assessed based on physical stability and the degree or amount of deterioration. In the case of multi-component sites (e.g., mound and midden complex), as well as relatively large sites, the relatively best condition was used to characterize the entire site. Each site was assigned a value of Good, Fair, Poor, or Destroyed, as well as Inundated/Uncertain and Not Relocated/Unknown, defined as follows:

Good: No evidence of noticeable deterioration by natural or human activities. Site is stable with no current threat.

Fair: Evidence of ongoing deterioration, which if not corrected, will eventually degrade to a poor condition and result in a lowering of the sites' potential research value.

Poor: Severe deterioration is evident. If left uncorrected, will eventually result in a total loss of the site or subsite.

Destroyed: Completely lost or so severely damaged that the data potential/scientific research value is deemed insufficient to warrant further archaeological monitoring or investigation.

Inundated/Uncertain: When terrestrial archaeological resources are inundated as a result of rising sea level, construction of a dam, or other factor which makes them inaccessible.

Not Relocated/Unknown: When the location where the site was last documented was visited and the site could not be relocated.

As summarized in **Table 5-5**, at the time of the 1990-1996 surveys, 21 (68%) of the 31 sites were assessed to be in **Good** condition, since they exhibited no clear evidence of major disturbance or deterioration by natural and/or human forces and their archaeological values appeared to be well preserved. No site treatment actions were recommended. Two (6%) of the sites were in **Fair** condition. There was evidence of minor disturbance and deterioration by natural and/or human forces and some degree of corrective action was recommended to stabilize the sites and prevent further harm. Six (19%) were in **Poor** condition. There was evidence of major disturbance and rapid deterioration by natural and/or human forces, and immediate corrective actions were recommended to protect and preserve the remaining archaeological values. None of the sites were evaluated as either totally **Destroyed or Inundated** and 2 (6%) were **Not Relocated/Unknown.** Available site file data was not sufficient to make a judgment about site condition.

In 2005 and 2006, 16 of the 31 sites were visited and assessed by SEAC archaeologists (Hellman 2007). Ten of the sites were found to be in Good condition, and six were assessed as Fair (**Table 5-5**). Compared with the survey results from the 1990s, the condition

RELEASED - Printed documents may be obsolete; validate prior to use.

of five sites remained unchanged (Good condition), and six degraded from Good to Fair condition (**Table 5-5**). Damage to the six deteriorated sites was noted as resulting from shoreline erosion and/or rooting by feral hogs. While four sites were evaluated as in better condition in 2005-2006 compared with 1990-1996 (from Fair or Poor to Good), these differences are interpreted to reflect the judgments of the respective evaluators, rather than an actual improvement in site condition.

Table 5-5. Comparison Summary of Site Condition Assessments.

Condition	ACI Surveys 1990-1996		SEAC					
			2005-06		2010		2014	
	#	%	#	%	#	%	#	%
Good	21	68	10	63	10	63	1	100
Fair	2	6	6	37	0	0	0	0
Poor	6	19	0	0	0	0	0	0
Destroyed	0	0	0	0	6	37	0	0
Inundated/ Uncertain	0	0	0	0	0	0	0	0
Not relocated/ Unknown	2	6	0	0	0	0	0	0
Totals	**31**	**100**	**16**	**100**	**16**	**100**	**1**	**100**

In June 2010, SEAC completed a follow-up condition inspection of sites from a mosquito control impoundment dike removal area. The conditions of these sites are noted below:

- Widgeon Bay (8BR184) Good
- No Official Name (8BR185) Good
- No Official Name (8BR1948) Good
- Long Shore Midden (8BR1949) Good
- No Official Name (8BR1950) Destroyed
- N. Mangrove Midden (8BR1951) Destroyed
- No Official Name (8BR1952) Destroyed
- Shell Dipper (8BR1953) Good
- No Official Name (8BR1954) Destroyed
- No Official Name (8BR1955) Destroyed
- Cut Corner Midden (8BR1956) Good
- Ephemeral Midden (8BR185) Good
- Canoer's Corner (8BR1959) Good
- Buried Midden (8BR2413) Good
- No Official Name (8BR2672) Destroyed
- No Official Name (8BR2673) Good

In addition, on February 10, 2014, SEAC personnel conducted a site condition assessment of the Max Hoeck Burial Mound (CANA-54). The inspection did not reveal any new disturbances to the mound, which had been subject to artifact hunting in the 1960s. The mound was found to be in **Good** condition (Hellmann 2014).

Most of the archaeological sites at KSC have not been revisited and evaluated since the 1990s. Thus, with the exception of sites in the Joint Area (KSC North Area east of SR-3) visited by SEAC personnel in 2005 and 2006 (Hellman 2007), and also in 2010 and 2014, the information regarding site condition requires updating. As funding and personnel allow, all the archaeological sites identified in **Table 5-6** should be visited and the condition documented. Subsequently all these sites should be monitored annually and assessed for evidence of vandalism and the adverse impacts of erosion, agriculture, wild fires and controlled burns, animal activity, and other potentially destructive actions. These inspections, scheduled and authorized by the HPO, may be conducted by professional contractors meeting the Secretary of the Interior's professional qualifications, or by SEAC or MINWR personnel, by prior agreement with KSC. If necessary, appropriate actions to ensure continued site protection shall be implemented. All monitoring and corrective measures should be documented and filed with the HPO.

5.9.3 Protection Strategies

KSC will strive to avoid adverse impacts to all archaeological sites at KSC, with the exception of those previously evaluated as ineligible for listing in the NRHP (Category E sites in **Appendix D**). These sites will require no further management considerations. No ground-disturbing activities or construction shall be permitted within 91 m (300 ft) of known burial sites, including aboriginal mounds and historic cemeteries.

When necessary, appropriate protective measures will be taken to prevent site degradation. These measures may include site stabilization, erosion control, road closure, patrolling sites, repair, and/or salvage of data threatened with imminent destruction or loss.

In reality, protection of archaeological sites at KSC is hampered by several factors. For one, the exact location of many sites is not known. Secondly, the FWS, responsible for law enforcement in the non-operational areas, is very short-staffed, with limited law enforcement officers to cover over 56,656 ha (140,000 ac) spanning 56 km (35 mi) in length

RELEASED - Printed documents may be obsolete; validate prior to use.

(USDOI-FWS 2008:70). In addition, the potential for site vandalism and disturbance is exacerbated by the more than one million annual visitors to the MINWR who have access to archaeological sites via boat and car.

RELEASED - Printed documents may be obsolete; validate prior to use.

Table 5-6. Protection Measures for Treatment and Mitigation of Archaeological Sites Recommended for Preservation and Protection.

Site No./Name	Site Type/ Component	Condition and Assessment/Date	Protection Measures/Comments
8BR77 (A, B) Nauman's Place	Burial Mound (A), Shell Midden (B)	Fair (A) to Good (B)/1992	Mound has been looted. Periodically monitor to assess damage. If evidence of vandalism, post penalty warning and erect physical barriers to prevent access.
8BR78 (B, D) Dummett's Place	Homestead Ruins (B), Historic Grove (D)	Poor/1992	Stabilize ruins; measured drawings of homestead ruins, including wells (2), to HABS standards; limited archaeological survey and mapping of homestead features; botanical survey of grove. Midden (A) and castle (C) have been destroyed.
8BR139 Dummett Grove NE	Shell Midden	Good/1996 Good/2006	Periodic monitoring to access damage due to erosion and disturbance due to feral pigs. Alterations to canal will require archaeological monitoring.
8BR143 Ragin Midden	Shell Midden, Historic Refuse	Good/1996 Fair/2006	Periodic monitoring to assess damage due to shoreline erosion and rooting by feral hogs. Prohibit further ditching.
8BR145 Clark Slough	Shell Midden	Good/1996 Good/2006	Periodic monitoring to assess damage due to erosion. Archaeological monitoring of alterations to adjacent dike road, or during ditching/dredging.
8BR151 No Name	Burial Mound, Artifact Scatter	Good/1991 Good/2006	Periodic monitoring to assess damage due to erosion and/or vandalism. If evidence of vandalism, post penalty warning, and erect physical barriers to prevent access.
8BR155 Granny Cove	Shell Midden	Good/1992	Periodic monitoring to assess damage due to erosion.
8BR170 Opposite Futch Cove	Midden, Historic Refuse	Good (southern part), Destroyed (northern part) /1996	Archaeological monitoring of future land altering activities in the southern portion of the site area, including the VIP seating area.
8BR175 Fort Ann	Historic fort	Poor (southern part), Destroyed (northern part) /1992	Documentary research; site mapping; limited archaeological excavation.
8BR188 Old Haulover Canal	Historic canal	Good (W of SR-3) Destroyed (E of SR-3)/1992 Good/2005	Documentary research; site mapping; archaeological survey of portion west of SR 3; restoration and repair.

RELEASED - Printed documents may be obsolete; validate prior to use.

Table 5-6. Protection Measures for Treatment and Mitigation of Archaeological Sites Recommended for Preservation and Protection (cont.).

Site No./Name	Site Type/ Component	Condition and Assessment/Date	Protection Measures/Comments
8BR191 No Name (SEAC equates this site with 8BR1624)	Historic cemetery	Not Relocated/ Unknown/1996	Site is unverified at recorded location. If human remains associated with this cemetery are accidentally uncovered, cease all work, notify the State Archaeologist, and proceed as directed. Fence cemetery after boundaries are ascertained.
8BR205 Max Hoeck Mound and Midden	Burial mound, Shell midden, Historic refuse	Good /2005	No disturbances noted in 2005.
8BR206 Pepper Hammock	Artifact scatter, Historic refuse	Good/1990	Periodic monitoring to access damage due to erosion and disturbance due to feral pigs.
8BR774 Astronaut Road	Artifact scatter	Good/1991	Avoid impact during future road improvements. Mark site boundaries.
8BR1622 Allenhurst Midden	Midden	Good/1992	Avoid agricultural impacts. Mark site boundaries.
8BR1624 Emma Watton Cemetery	Historic cemetery	Good/1992	Maintain fencing.
8BR1626 Crook/Watton Cemetery	Historic cemetery	Good/1992	Maintain fencing.
8BR1630 Shiloh Sand Hills	Artifact Scatter	Poor/1992	Avoid agricultural impacts. Mark site boundaries.
8BR1631 Griffis Cemetery	Historic cemetery	Good/1992	Maintain fencing.
8BR1632 Edgar/Campbell Midden	Shell Midden	Good/1996 Fair/2006	Periodic monitoring to assess damage due to shoreline erosion and rooting by feral hogs. Prohibit ditching.
8BR1633 Apiary #53	Artifact scatter, Midden	Poor/1996 Good/2006	Avoid agricultural impacts. Mark site boundaries.

RELEASED - Printed documents may be obsolete; validate prior to use.

Table 5-6. Protection Measures for Treatment and Mitigation of Archaeological Sites Recommended for Preservation and Protection (cont.).

Site No./Name	Site Type/ Component	Condition and Assessment/Date	Protection Measures/Comments
8BR1673 Haulover Sand Mound and Midden	Burial Mound, Midden	Good/1996 Good/2006	Mark site boundaries. Erect protective fencing around mound with at least a 15 m (49 ft) buffer around the perimeter. Prohibit further tree planting and removal within fenced zone. Periodic monitoring to assess damage to midden area done by feral pigs. Mark midden boundaries and avoid agricultural impacts.
8BR1674 76th Street NW Midden	Shell Midden	Good/1996 Fair/2006	Periodic monitoring to assess damage due to shoreline erosion.
8BR1676 Campbell/Jack-son Cemetery	Historic cemetery	Fair/1996 Good/2005	Maintain fencing; stabilize historic grave markers.
8VO129 Bill's Hill (also known as Scobey Place)	Shell midden; Burial mound	Midden is mostly destroyed, Mound is Fair/1996 Good/2006	Periodic monitoring to assess damage due to vandalism of mound. If evidence of vandalism, post penalty warning, and erect physical barriers to prevent access.
8VO130 Ross Hammock Midden	Shell midden	Good/1996 Fair/2006	Periodic monitoring to assess damage due to erosion and/or vandalism. Limited archaeological survey and mapping of midden located north and west of the saltworks.
8VO131 Ross Hammock Indian Mounds	Burial mounds (2)	Good/1996 Fair/2006	Periodic monitoring to assess damage due to vandalism.
8VO148 Griffis Place	Burial mound	Good/1992	Periodic monitoring to assess damage due to vandalism. If evidence of vandalism, post penalty warning and erect physical barriers to prevent access.
8VO160 Sugar Mill Ruins	Historic ruins	Poor/1992	Stabilize ruins; measured drawings to HABS standards; minimal archaeological testing; survey of surrounding area with mapping of all above-ground features.
8VO213 Ross Hammock Salt Rendering Plant	Historic ruins	Poor/1996 Good/2006	Stabilize ruins; measured drawings to HABS standards; minimal archaeological testing; survey of surrounding area with mapping of all above-ground features.

RELEASED - Printed documents may be obsolete; validate prior to use.

Table 5-6. Protection Measures for Treatment and Mitigation of Archaeological Sites Recommended for Preservation and Protection (cont.).

Site No./Name	Site Type/ Component	Condition and Assessment/Date	Protection Measures/Comments
8BR2258 New Haulover Canal	Historic Canal	Good/2008	Maintained by the U.S. Army Corp of Engineers.
8VO2599 Coast Guard Life Saving Station (also known as Mosquito Lagoon House of Refuge)	Historic ruins	Good/2006	Most of site covered by parking lot and vegetation.
8VO6786 Kuhl Midden	Shell midden, Historic refuse	Good/1996 Fair/2006	Periodic monitoring to assess damage due to shoreline erosion, rooting by feral hogs, and/or vandalism. Prohibit further ditching.
8VO8943 Brutus Midden	Shell midden	Good/2010	Periodic monitoring and scheduled condition assessments every five years.
8VO8944 Caesar Midden	Shell midden	Good/2010	Periodic monitoring and scheduled condition assessments every five years.

RELEASED - Printed documents may be obsolete; validate prior to use.

The general strategies KSC may implement or encourage for the protection of NRHP-listed or eligible archaeological sites include:

- **Avoidance:** For any known archaeological site that is listed or eligible for the NRHP, the preferred protection measure is the avoidance of any KSC activity or undertaking that could adversely affect it. For undiscovered sites, the project review process, which uses the ZAP maps as a management tool, will aid in the avoidance of impacts to listed, eligible, or potentially significant sites.

- **Monitoring:** Monitoring is defined as "*the periodic inspection of cultural resources to ascertain their condition and to assess the effects of natural and/or human forces.*" For example, periodic monitoring of significant shell midden sites along the shore of Mosquito Lagoon may be appropriate to ascertain the effects of erosion due to fluctuating water levels or severe storms. Sites previously damaged by unauthorized digging or disturbance by feral hogs should also be monitored on a regular basis.

- **Stabilization:** Stabilization involves *"the act or process of applying measures designed to reestablish a weather resistant enclosure and the structural stability of an unsafe or deteriorated property while maintaining the essential form as it exists at present."* For example, historic period archaeological sites with above-ground features, such as the Dummett Homestead ruins (**8BR78**) and Sugar Mill Ruins (**8VO160**) may require stabilization to prevent further deterioration. Shell midden sites located along Mosquito Lagoon, degraded by shoreline erosion, may also need to be stabilized. In cases where the growth of exotic vegetation threatens site integrity, stability may be enhanced through careful vegetation removal.

- **Physical Protection:** Physical protection of an archaeological site may include the installation of **fencing** around the site perimeter, allowing for a buffer zone of approximately 9 m (30 ft). **Marking** (with flagging tape, pin flags, stakes, or some other marking device) the site boundaries when ground disturbing activities are planned to occur within 30 m (100 ft) of an NRHP-listed or eligible site is another protective measure to be employed for authorized actions. To prevent illegal acts, the erection of physical barriers (e.g., felled tree across the road) or the closure of roads to prevent access to significant archaeological sites may be used to deter vandalism.

- **Restoration and Repair:** Restoration is defined as "*the act or process of accurately recovering the form and details of a property and its setting as it appeared at a particular period of time by means of the removal of later work or by the replacement of missing earlier work".* Sites damaged from natural deterioration, as well as by vandalism, may be protected through repair and restoration.

- **Site Confidentiality:** Information pertaining to the location or character of archaeological resources (as contained in reports and manuscripts, site file forms, and maps) will be restricted, to protect the sites from vandalism, theft, and unauthorized public visitation. **This includes disclosure to KSC personnel as well as the public through Freedom of Information Act requests.** On-site interpretive displays will be allowed only in secured areas of KSC and where adequate protective measures are in place.

  The legal authority for restricting information is provided by Section 304 of the NHPA and Section 9(a) of the ARPA. The National Register regulations (36 CFR Part 60) also provide that federal nominating authorities need not reveal the specific location or character of a resource listed in or being nominated for inclusion in the National Register if disclosing this information would endanger the resource. Access to records documenting human remains, funerary objects, and sacred materials or associated materials are protected under federal regulations and shall be restricted.

RELEASED - Printed documents may be obsolete; validate prior to use.

Confidentiality is also covered by state statute. Legislation enacted in January 2002 **exempts the locations of archaeological sites in Florida from the provisions of the "Sunshine Law"** (s. 119.07(1)) and s. 24(a) of Article I of the State Constitution. Chapter 267.135 (Location of archaeological sites) allows the DHR to restrict information identifying the location of an archaeological site if the DHR finds that such disclosure will create a risk of harm, theft, or destruction at the site (Chapter 267.135).

- **Public Education:** KSC encourages teaching the public about the need to preserve and protect our fragile cultural resources. All on-site interpretive displays, brochures, public lectures, and other forms of educational outreach will advocate a strong preservation ethic.

- **Detection, Investigation, and Prosecution of Illegal Acts:** In cases where ARPA or other laws or regulations protecting cultural resources at KSC are violated, MINWR law enforcement officers will have the lead responsibility for all aspects of crime detection, investigation, and prosecution, in cooperation with the Department of Justice. Assistance will be provided by the HPO or designees.

5.9.4 Data Recovery

All reasonable efforts will be made to preserve KSC's archaeological sites. Only when avoidance and in-place preservation is not feasible should mitigative excavation be carried out. If excavation is the agreed upon treatment, resulting from consultation with the SHPO and other interested parties, the work must always be governed by the stipulations of a formal MOA unless a PA has been implemented. The following basic principles, consistent with the ACHP's guidance, "Recommended Approach for Consultation on Recovery of Significant Information from Archaeological Sites," shall guide the data recovery project design and implementation:

- Excavation is destructive and the non-renewable nature of each site should be recognized.
- A research design and data recovery plan should be formulated and implemented. These "should be grounded in and related to the priorities established in regional, state, and local historic preservation plans, the needs of land and resource managers, academic research interests, and other legitimate public interests."
- The most cost-effective techniques for data recovery and analysis should be used.
- Appropriate arrangements for the curation of archaeological materials and records should be made.
- The report should be accessible to the public.
- Human remains and funerary objects should be treated respectfully.

SOPs for mitigative excavation (Phase III) and data recovery are provided in **Chapter 6, SOP #9**.

5.9.5 Site-Specific Recommendations

The recommendation category for all archaeological sites within KSC, current as of 2014, is included in **Appendix D** and summarized in **Table 5-7**. Summarizing these data, a total of 36 sites including all NRHP-listed (Category A) and most NRHP-eligible (Category B) sites, as well as all historic cemeteries (Category D and Category E) are classified as **Category 1** above. These significant (i.e., NRHP-listed or eligible) archaeological resources at KSC will be preserved and protected. It is the intent of KSC to avoid any adverse impact to all sites containing human remains, including aboriginal and historic period resources. For the other Category 1 sites, if adverse impact due to project development cannot be avoided, data recovery through systematic excavation, conducted in conformity with a problem-oriented research design, will be carried out. Protection procedures for the 35 Category 1 sites are summarized in **Table 5-6.** Among these archaeological resources are several outstanding NRHP-listed or eligible properties that should be afforded special consideration. These include the site of Fort Ann (**8BR175**) and the remains of the Dummett Homestead and Grove (**8BR78**).

RELEASED - Printed documents may be obsolete; validate prior to use.

Table 5-7. Summary of Site-Specific Recommendations by Category.

Category	Recommendation	No. Sites
1	Preservation and protection	36
2	Limited test excavation	8
3	Additional archaeological survey	69
4	No further actions	73
Total		**186**

Fort Ann (8BR175) is the site of a Seminole War period fort in use for less than one year, from 1837 until 1838. While a large part of this fortification has been destroyed, the southeastern portion is still intact. A contour map of the site, which ties in with the Old Haulover Canal directly to the south, should be prepared. Sufficient documentary research also should be carried out in order to complete a National Register nomination. For the future, as funding allows, limited excavation, analysis, and public interpretation may be conducted.

Douglas Dummett was a pioneer settler who most likely arrived in the present KSC North Area in the early 1840s. The ruins of the **Dummett Homestead (8BR78B)** and **Orange Grove (8BR78D)** are eligible for National Register listing. Following the suggestions originally made by Griffin and Miller (1978:126), the homestead ruins, including the massive fireplace and two wells, should be architecturally recorded. Limited archaeological testing to locate other parts of the Dummett complex should also be conducted. A botanical survey of the grove and homestead areas will also provide valuable information about this site. In the future, the Dummett homestead and grove area, as well as Fort Ann and the Old Haulover Canal, may be suitable as interpretive stops along a historic trail.

For the following eight sites (**8BR141, 8BR913, 8BR914, 8BR1619, 8BR1620, 8BR1680, 8BR2414, and 8BR2415**) assigned to **Recommendation Category 2 (Appendix D)**, limited test excavation is recommended in order to make a final determination of National Register eligibility. This work is recommended only in cases of proposed development within the respective site areas. Otherwise, to the extent possible, these sites will be protected through the avoidance of adverse impacts.

Sixty-nine sites in **Appendix D** are recommended for additional archaeological survey, **Category 3**. Most of these sites were recorded three decades ago, some based on informant information or limited surface reconnaissance. As a result, the horizontal and vertical dimensions, contextual integrity, and significance of these sites have not yet been determined. To the extent possible, these resources will also be protected.

No additional archaeological work is recommended for the 72 **Category 4** sites listed in **Appendix D**. These sites are characterized by non-remarkable assemblages of cultural materials, or have been severely degraded or destroyed. No special protective measures will be extended to these non-significant resources.

5.10 RECORDS AND DATA MANAGEMENT

5.10.1 Routine Records Management

In accordance with Section 112(a)(2) of the NHPA, CRM records and other data, including that produced by historical research and archaeological survey and excavation are to be **permanently maintained** in appropriate databases and made available to potential users. The KSC Archivist receives a copy of all final HABS/HAER and survey reports.

In 1998, KSC assessed its CRM records, with the assistance of ACI (ACI 1998c). The purpose of this project was to create a set of SOPs for the management of KSC's records pertaining to cultural resources. As a result, a set of procedures for the organization, treatment, and ongoing management of records associated with historic properties, including a disposition schedule, was developed. These recommendations were developed in conformance with the requirements of the KSC Records Management Program and the guidelines developed by the KSC Records Manager at that time (Wheeler 1997).

The CRM records are retained in accordance with the following NASA documentation, NPD 1440.6 (as revised), NASA Records Management, NPR 1441.1 (as revised), and NASA Records Retention Schedules as revised. The record holdings are maintained on the KSC-R-1352, Business Record Template. Official correspondence, such as Sections 106/110, HABS/HAER recordation efforts, surveys, and reports are considered permanent. These records may be transferred to NARA seven years after the program has ended. The ICRMP is destroyed five years after issuance of a new plan or procedure and

RELEASED - Printed documents may be obsolete; validate prior to use.

the postal records (certified mail receipts) are kept for one year.

All CRM records produced by contractors during their investigations at KSC are the property of NASA (e.g. field notes, maps, drawings, interview notes, artifact inventories, photographs, etc.) along with the final report and artifact collections and must be transferred to the HPO at the end of the contract period. This requirement shall be included as a clause in all contracts for professional CRM services. As funding allows, all project-related archaeological records will be inventoried and conserved.

The HPO will work with the KSC Records Manager and KSC Archivist to ensure that existing and new records are conserved, duplicated, catalogued, and prepared for archival storage, as appropriate. The HPO is responsible for preparing their cultural resource records for official retirement.

5.10.2 NETS CRM Database

NASA Headquarters EMD manages the NETS database, which is maintained at Glenn Research Center on behalf of the Agency. This information management tool assists "in the collection, maintenance, and reporting of environmental data related to KSC operations" (KNPR 8500.1, Rev. C-1). The CRM Module of this database contains quantitative information on historic properties. As modules are developed and implemented, the HPO will comply with all data input requests in a timely manner.

5.10.3 GIS-based Mapping

The KSC GIS database includes layers depicting the locations of recorded archaeological sites; historic buildings, structures, areas, objects, and districts that are listed or eligible for listing in the NRHP; survey areas; and zones of archaeological potential. This database, maintained by contractor support, is an important tool that facilitates the integration of CRM issues into planning and project review. In accordance with a schedule determined by the HPO, new information will be provided to the contractor for database updates. Each year the HPO reviews the maps for updating and management planning purposes. The information is provided to the NASA team (e.g., Master Planner, Real Property Office), contractor support, and land managers.

5.11 CRM TRAINING

All KSC personnel involved with cultural resource issues will be trained at a level commensurate with their responsibilities. Training will emphasize information on preserving and maintaining significant cultural resources, including archaeological sites and historic facilities, and will emphasize the need for ongoing stewardship and protection. Funding will be sought to ensure that EMB personnel working as cultural resource managers attend training courses that help them to develop their professional knowledge regarding the Section 106 and 110 processes, changes in federal CRM programs, legislative amendments, and policies affecting cultural resources, including Native American issues. Training is given at annual CRM Panel meetings. In general, training may be in a classroom setting, electronic media, meetings, or other formats. There are classes available in the SATERN Training Module including Course HQ-011-UNHD, "Understanding NASA's Historic Districts" and Course HQ-011-NNHPA, "NASA and the National Historic Preservation Act." Additional guidance can be obtained by consulting with the NASA Headquarters FPO.

5.12 PUBLIC OUTREACH

Under the provisions of the National Aeronautics and Space Act of 1958, NASA is charged with development of public education and outreach programs. Section 10(c) of ARPA also directs federal agencies to develop and implement programs to increase public awareness of the significance of cultural resources within their facilities and the need to protect them.

As part of its continuing public outreach efforts, KSC will work to develop partnerships with local historical societies, archaeological societies, and other groups that advocate historic preservation, and to involve such public groups in ongoing CRM work. For example, volunteers may assist KSC in the periodic monitoring of archaeological sites along the Mosquito Lagoon shoreline in the aftermath of severe storms, in order to assess damage. Volunteers will also be encouraged to participate in on-site test and mitigative salvage excavations, working under the direction of professional archaeologists under contract with KSC. Such hands-on involvement will provide the interested public with opportunities to learn firsthand about the prehistory and history of the

RELEASED - Printed documents may be obsolete; validate prior to use.

region and how archaeologists study and protect the past.

5.13 CRM PROGRAM PLANNING

Implementation of the cultural resource programs and procedures addressed in this plan will require the dedication of long-term funding. At the present time, appropriations are not sufficient to enable the policies outlined in the ICRMP, nor to maintain a level of staffing and contractor services to facilitate timely completion of these programs. Nevertheless, during the five-year period ending in fiscal year 2018, KSC's short- and long-term goals include, but are not limited to, the following programs and actions:

- Proactive HABS/HAER mitigation measures for historic properties adversely affected by future programs, lease agreements and modification or demolition activities
- Continue interagency coordination with the MINWR and CNS through data sharing, meetings, site visits, etc
- Develop onsite CRM training for program and project managers, facility managers, tenant organizations, etc
- Conduct archaeological field survey of historic period archaeological sites to validate the predictive model
- Updates to the GIS database when new survey have been completed
- Field identification and evaluation of archaeological sites with unverified locations
- Renew loan agreements for collections with CNS. In 2011 the agreements were extended until 7/10/2015
- Assess the condition of the NHLs owned by NASA at CCAFS
- Develop a protection program for archaeological sites
- Develop a maintenance and treatment program for historic properties
- Develop a PA with the SHPO and ACHP for management of archaeological sites

5.14 ICRMP IMPLEMENTATION

The KSC ICRMP will be updated every five years, with yearly review and supplementation, as needed, to ensure usefulness and continued compliance with all applicable federal laws and regulations. Updates will take into account all projects conducted at KSC in the interim period, as well as changing historic contexts for the historic facilities. All updates will be forwarded to the FPO for review and comment prior to incorporation. Managerial authority for the implementation and ongoing review of the ICRMP will reside with the HPO.

RELEASED - Printed documents may be obsolete; validate prior to use.

EXHIBIT 5-1
SELECTED AGENCY CONTACTS

RELEASED - Printed documents may be obsolete; validate prior to use.

SELECTED AGENCY CONTACTS

Advisory Council on Historic Preservation, Office of Federal Agency Programs
401 F Street NW, Suite 308, Washington, D.C. 20001-2637
Phone: 202-606-8503; achp@achp.gov
Mr. Milford Wayne Donaldson, Chairman
Mr. John M. Fowler, Executive Director
Dr. Tom McCulloch, Senior Program Analyst; Phone: 202-517-0222; tmcculloch@achp.gov
Mr. Brian Lusher, Program Analyst, Federal Property Management Section; Phone: 202-517-0221; blusher@achp.gov

Florida Department of State
Division of Historical Resources
R.A. Gray Building, 500 S. Bronough St., Tallahassee, Florida 32399-0250
Phone: 850-245-6333; Fax: 850-245-6437
Mr. Robert Bendus, SHPO and Division Director; Phone: 850-245-6300; Robert.Bendus@DOS.MyFlorida.com
Dr. Tim Parsons, Compliance Review Supervisor; Timothy.Parsons@DOS.MyFlorida.com
Ms. Alissa Lotane, Chief of the Bureau of Historic Preservation (for NRHP and NHL coordination); Alissa.Lotane@DOS.MyFlorida.com

Florida Department of State
Bureau of Archaeological Research
B. Calvin Jones Center for Archaeology at the Governor Martin House
1001 deSoto Park Drive, Tallahassee, Florida 32301
Phone: 850-245-6444; Fax: 850-245-6452
Dr. Mary Glowacki, Bureau Chief and State Archaeologist; Mary.Glowacki@DOS.MyFlorida.com

Merritt Island National Wildlife Refuge
P.O. Box 2683, Titusville, Florida 32781
Ms. Layne Hamilton, Refuge Manager; Phone: 321-861-2278; Fax: 321-861-1276; Layne_Hamilton@fws,com
Ms. Sandra Mickey, Supervisory Park Ranger; Phone: 321- 861-2384; Fax: 321-861-2310; Sandra_Mickey@fws.gov
Mr. Richard S. Kanaski, Regional Historic Preservation Officer and Regional Archaeologist, U.S. Fish and Wildlife Service, Southeast Region; Phone: 843-784-6310; Richard_Kanaski@fws.gov

National Aeronautics and Space Administration Headquarters
Environmental Management Division
Mail Suite: 5B52, 300 E Street, SW, Washington, D.C. 20546-0001
Phone: 202-358-7324; Fax: 202-358-2826
Ms. Jennifer Groman, Federal Preservation Officer; jennifer.a.groman@nasa.gov

National Park Service
Canaveral National Seashore
212 S. Washington Ave., Titusville, Florida 32796
Phone: 321- 267-1110; Fax: 321-264-2906
Ms. Myrna Palfrey, Superintendent; myrna_palfrey@nps.gov
Ms. Kristen Kneifl, Resource Manager; Kristen_Kneifl@nps.gov

RELEASED - Printed documents may be obsolete; validate prior to use.

National Park Service
Southeast Archaeological Center (SEAC)
2035 East Paul Dirac Drive, Johnson Building, Suite 120, Tallahassee, Florida 32310
Phone: 850-580-3011; Fax 850-580-2884
Mr. David Morgan, Director, 850-580-3011, ext. 123; David_Morgan@nps.gov
Ms. Margo Schwadron, Archaeologist, 850-580-3011, ext. 238; Margo_Schwadron@nps.gov
Mr. Richard Vernon, Curator, 850-580-3011; Richard_Vernon@nps.gov

National Park Service
Southeast Regional Office
Atlanta Federal Center, 1924 Building, 100 Alabama Street, NW, Atlanta, Georgia 30303
Phone: 404-507-5600
Mr. Stan Austin, Regional Director; 404-507-5604; Stan_Austin@nps.gov
NHL Program, 404-507-5792, Fax: 404-562-3202; SER_NHL@nps.gov
Bethany Serafine, Historian, HABS/HAER/HALS Division, Heritage Documentation Program, Phone: 404-507-5788; Fax: 404-562-3202; Bethany_Serafine@nps.gov

National Park Service
Heritage Preservation Services
1201 Eye Street, NW, Washington, D.C 20005
Phone: 202-513-7270
Mr. John Smith, Preservation Compliance Coordinator, 202-354-2095; jon_smith@nps.gov

U.S. Air Force
45 CES/CEVP
Mailing address: 1224 Jupiter Street, Mail Stop 9125, Patrick AFB, Florida 32925-3343
Physical address: Building 60600, Room 2008, Skid Strip Road, CCAFS
Phone: 321- 853-0886; Fax: 321-853-6517
Mr. Thomas E. Penders, 45th Space Wing Cultural Resources Manager
Thomas.Penders@patrick.af.mil

RELEASED - Printed documents may be obsolete; validate prior to use.

EXHIBIT 5-2
INTERAGENCY AGREEMENT BETWEEN NASA, KSC AND THE U.S. DOI, FWS FOR USE AND MANAGEMENT OF PROPERTY AT NASA, KSC KNOWN AS THE MERRITT ISLAND NATIONAL WILDLIFE REFUGE (MINWR)

RELEASED - Printed documents may be obsolete; validate prior to use.

INTERAGENCY AGREEMENT BETWEEN THE NATIONAL AERONAUTICS AND SPACE ADMINISTRATION, JOHN F. KENNEDY SPACE CENTER AND U.S. DEPARTMENT OF THE INTERIOR, FISH AND WILDLIFE SERVICE FOR USE AND MANAGEMENT OF PROPERTY AT NASA, JOHN F. KENNEDY SPACE CENTER KNOWN AS THE MERRITT ISLAND NATIONAL WILDLIFE REFUGE

I. AUTHORITY

This Agreement is entered into by the National Aeronautics and Space Administration (NASA), John F. Kennedy Space Center (KSC) located at KSC, FL 32899, and United States Department of the Interior, Fish and Wildlife Service (FWS), located at Merritt Island National Wildlife Refuge (MINWR), P.O. Box 2683, Titusville, FL 32781. This Agreement is entered into by NASA KSC pursuant to sections 203(c)(5) and (6) of the Space Act of 1958, 51 U.S.C §20113(c). This Agreement is entered into by FWS pursuant to the Acquisition of Property, 16 U.S.C. §459j-1, 4, 6, 7, and 8; the Economy Act, 16 U.S.C. §742e(c) and 742g(d); Coordination Act, 16 U.S.C. §661-666c; the Migratory Bird Conservation Act, 16 U.S.C §715(d); and the Refuge Administration Act, 16 U.S.C. §668dd(b).

II. BACKGROUND AND SCOPE OF AGREEMENT

NASA acquired certain lands and adjacent waters located in Brevard and Volusia Counties in the 1960s. The land acquired was necessary for administrative and launch operations, to include security and safety zones. These lands also held special value as a haven for migratory birds and other wildlife, citrus production, and a potential site for outdoor recreation and education. The U.S. FWS is the principal Federal agency responsible for conserving, protecting, and enhancing fish, wildlife, and plants and their habitats for the continuing benefit of the American people. The FWS manages the 150-million-acre National Wildlife Refuge System that encompasses more than 556 national wildlife refuges.

On August 28, 1963, the FWS was first permitted by Interagency Agreement to establish a national wildlife refuge on certain portions of KSC, to be called the MINWR. This Agreement will establish a joint Interagency Agreement between NASA KSC Environmental Management Branch (EMB), Real Property Management Office, and the

RELEASED - Printed documents may be obsolete; validate prior to use.

U.S. Department of Interior, Fish and Wildlife Service, for the use and management of the MINWR.

A map of NASA KSC and the areas that are currently being managed as the MINWR is included as Attachment A to this Agreement.

III. RESPONSIBILITIES

A. The FWS shall have the following responsibilities:

1. The FWS shall have primary administration over real property at NASA KSC which has not been withdrawn from MINWR in accordance with Kennedy Documented Procedures (KDP)-P-3235, "Land Withdrawal from FWS to Support NASA Missions."

2. The use of NASA KSC property by the FWS as described herein shall be subject to all valid easements, rights-of-way, licenses, and present or future interests in, upon, across, or through said property granted by NASA for purposes related to the space program. Programs and activities of the FWS shall be carried out on a basis of noninterference with the space program, and any program or activity shall be terminated by the FWS upon a determination by NASA KSC of incompatibility with the space program, provided, however, that no such determination shall be made without prior notice to the FWS. The FWS shall take into account NASA's future development plans when implementing or changing its land management activities.

3. The FWS shall conduct habitat management activities, including prescribed burning, control of exotic plants and animals, water-level management, planting and harvesting trees, and any other program to enhance and protect wildlife and fish populations.

4. The FWS shall be a party to an Interagency Agreement for Mosquito Control with the Brevard County Mosquito Control District and NASA KSC to ensure the existence of an effective mosquito control program that is compatible with sound wildlife management practices and National Wildlife Refuge System policy. Kennedy Customer Agreement (KCA)-1456, "Agreement Between National Aeronautics and Space Administration (NASA), United States Fish and Wildlife Service, and Brevard Mosquito Control District (BMCD)," establishes mosquito control policies for the MINWR as well as the NASA KSC operational areas.

5. The FWS shall administer a comprehensive public use management program for educational and recreational purposes compatible with refuge purposes. This may include concessions, permits, leases, and other use of commercial activities related to the public. FWS shall inform NASA of such permits, leases, and other uses.

6. The FWS shall coordinate prescribed burns on MINWR in accordance with the "Joint Operating Procedure Between the 45th Space Wing, U.S. FWS, and KSC for Prescribed Burning on the MINWR, KSC, and Cape Canaveral Air Force Station, Florida," KCA-

RELEASED - Printed documents may be obsolete; validate prior to use.

4205. The list of fire management units to be burned in a given calendar year will be provided to NASA KSC, Facilities Systems and Services Division, in January of each year for coordination and planning purposes. NASA KSC management will assist the FWS in resolving any operational or other barriers in order to accomplish prescribed burns.

7. The FWS shall coordinate on proposals for research projects proposed by NASA, its contractors, grantees, and other partners who are outside the annual ecological monitoring plan and issue special use permits for research activities proposed within areas managed by FWS, provided these proposals meet compatibility requirements and are consistent with National Wildlife Refuge System policy.

8. The FWS shall, upon request by NASA KSC, close all or any part of MINWR to the public during checkout and launch periods or during emergencies or other situations involving safety and security of property or personnel.

9. The FWS may construct, alter, operate, and maintain dikes, impoundments, sub-impoundments, and water control structures, fire lanes, and secondary roads essential to MINWR operations which do not interfere with or otherwise affect NASA KSC operations, subject to KSC asset management procedures as outlined in KNPR 8830.1, "Facility Asset Management Procedural Requirements," and environmental requirements in accordance with KNPR 8500.1, "KSC Environmental Requirements."

10. The FWS may construct, alter, and maintain field offices, storage and maintenance buildings, and related facilities which do not interfere with or affect NASA operations. Siting of any such construction shall be approved by NASA KSC in accordance with its master plan siting procedures. FWS will complete and submit environmental checklists to NASA KSC for projects in accordance with KNPR 8500.1. All such construction shall meet NASA KSC building and fire inspection standards and applicable Federal, state, and local environmental regulations. The FWS shall, in general, fund any and all facilities constructed, maintained, or used by the FWS in its program, provided, however, that services, such as minor construction and maintenance, may be provided by NASA at no cost to the FWS when personnel and equipment are available for the requested purpose.

11. The FWS shall enforce such rules and regulations as are necessary, and within its legal authority, in exercising the privileges granted in this Agreement. The rules and regulations prescribed by NASA to govern the use of KSC property shall have priority. NASA's determinations shall be controlling in all matters pertaining to the space program of the United States, particularly with respect to such matters as security, safety, public health, overflights, and radio and instrumentation interference.

12. The FWS shall, at its own expense and without cost or expense to NASA, preserve, maintain, and keep in good repair and condition the premises authorized to be used as a National Wildlife Refuge, provided, however, that NASA KSC shall continue to maintain all major highways (including associated railroad crossings, traffic signals, bridges, and drainage ditches) used by employees and the public for access to KSC and all secondary

RELEASED - Printed documents may be obsolete; validate prior to use.

roads essential to KSC operational requirements.

13. The FWS shall be a member of all working groups at NASA KSC where the outcome may affect working relationships between NASA KSC and the FWS.

14. The FWS shall be responsible for all maintenance, management, and compliance aspects of the apiary program.

15. The FWS shall partner with NASA KSC regarding the restoration of wetland and upland habitats selected as appropriate mitigation sites for environmental impacts resulting from NASA KSC projects and programs. The FWS will inform NASA KSC of other restoration efforts planned to determine if NASA KSC desires to participate or reserve that location for future mitigation. Restoration efforts shall be coordinated with the NASA Historical Preservation Officer when the restoration will impact known archaeological sites.

16. The FWS shall support NASA KSC regarding the development and implementation of projects and programs to support the Indian River Lagoon Basin Action Management Plan (BMAP) and the Banana River BMAP developed under the Total Maximum Daily Load program by the Florida Department of Environmental Protection where compatible with FWS management needs and policies.

17. The FWS shall be responsible for removal of nuisance wildlife at NASA KSC and be reimbursed for this effort under NASA KSC Interagency Purchase Request NNK11CA44I.

B. The NASA KSC shall have the following responsibilities:

1. NASA KSC shall provide services, such as telephone and electrical service and computer networking capability, hazardous and nonhazardous waste disposal, spill cleanup, emergency police and property protection assistance, and secondary emergency medical and ambulance service when local services are unavailable or insufficient to meet the need.

2. NASA KSC shall provide asset management services, such as real property inventory and site request processing, when required for development.

3. NASA KSC shall conduct routine sampling and analysis of drinking water wells used in FWS operations and provide the results to FWS.

4. NASA KSC shall partner with the FWS in the restoration of wetland and upland habitats to be used for the mitigation of impacts to these habitats resulting from NASA projects and programs. NASA KSC shall identify the need for mitigation credits and develop a restoration plan(s) with the FWS. NASA KSC shall fund the full cost of these restorations and shall implement the associated monitoring plans. The specifics of these restoration efforts shall be negotiated under separate contracts.

RELEASED - Printed documents may be obsolete; validate prior to use.

5. NASA KSC shall reimburse the FWS for the removal of nuisance wildlife from NASA facilities in accordance with NASA KSC Interagency Purchase Request NNK11CA44I.

6. NASA KSC shall update, as needed, a map of NASA KSC and the areas that are currently being managed as the MINWR to incorporate and reflect any changes of the use and management of property in accordance with the provisions of this Agreement. NASA will maintain the official file of this map on a Geographic Information System and will provide a copy to FWS.

IV. CURRENT LAND USE AND ENVIRONMENTAL COMPLIANCE

The right is hereby expressly reserved to NASA KSC, its officers, agents, employees, grantees, and contractors to enter upon the said land and water areas at any time and to make any use of said land which may be necessary in connection with the space program of the United States. NASA KSC will conduct routine assessments of FWS operations (including, but not limited to, waste management and disposal services provided by the Medical and Environmental Support Contract (MESC) and industrial wastewater management) to ensure compliance with applicable Federal, state, and NASA KSC environmental requirements in accordance with KNPR 8500.1. NASA KSC is not responsible for the compliance aspects of the FWS programs or operations. FWS will be responsible for any and all costs to bring operations into compliance.

V. FUTURE LAND USE

NASA KSC retains the right to site any future space program facility at any location within the area being managed as the MINWR, taking into consideration the FWS's utilization of the property in order to ensure compatibility between NASA KSC activities and wildlife management wherever practicable. The decision to site a new facility on lands being managed as part of the Refuge will, however, be within the sole discretion of NASA KSC and will follow KDP-KSC-P-1295, "Processing of KSC Real Property Agreements." For tracking and accountability purposes, the parties will utilize the process outlined in KDP-P-3235, "Land Withdrawal from FWS to Support NASA Missions," as a result of NASA KSC exercising this discretion.

Upon completion of the land conveyance, adjustments will be made to the master plan and the KSC real property report(s) to reflect the addition of land for use by NASA. The Appendix A map will be updated and a copy provided to FWS.

RELEASED - Printed documents may be obsolete; validate prior to use.

VI. ENVIRONMENTAL PERMITS

FWS will obtain and hold the operation permit for any septic tanks operated by the FWS. FWS will prepare said permit applications and forward to NASA KSC for review at the earliest available opportunity, and NASA KSC will return the application package to the FWS in a timely manner. FWS shall be responsible for any engineering signatures required on these applications and will be responsible for submitting them to the appropriate regulatory agency, as well as implementing their terms and conditions.

VII. FIRE PROTECTION

NASA KSC will have primary responsibility for all structural fires (including FWS structures), automobile fires, and aircraft firefighting and rescue within the NASA KSC boundaries. FWS is primarily responsible for wildland firefighting in all areas of the KSC (including NASA operational areas), except those fires that involve structures. Both parties will respond in the event that both vegetation and structures are threatened by a single conflagration. Both parties may request assistance from the other to respond to a fire emergency when necessary.

VIII. MEETINGS

In order to foster communication and the frequent exchange of information related to management of the refuge and NASA KSC's activities in the operational areas, the parties will meet at least quarterly to discuss their respective activities. Topics to be addressed may include, but will not be limited to:

- Changes in land management strategies
- Proposed research projects and programs
- Planned construction or renovation activities and projects
- Annual ecological monitoring data needs
- Cultural resource activities/management

Attendance at these meetings should, at a minimum, include representatives from the FWS, the NASA EMB, the Real Property Accountable Officer, and the MESC. Other attendees should be included as necessary and as requested by the parties in regular attendance. Minutes of the meetings shall be kept by the EMB and provided to the attendees of the meetings. Special topic meetings will be scheduled upon request of either party.

IX. FINANCIAL OBLIGATIONS

There will be no transfer of funds or other financial obligations between NASA and FWS in connection with this Agreement except for the contract for management of nuisance

RELEASED - Printed documents may be obsolete; validate prior to use.

wildlife, which is managed under NASA KSC Interagency Purchase Request NNK11CA441. Each party will fund its own participation. However, a separate instrument may provide for a transfer of funds or other NASA KSC resources within the scope of the Agreement based on NASA KSC program goals and availability of funding. Such instruments will be subagreements to this Agreement and will be executed on an as-needed basis. Those subagreements will incorporate all of the terms and conditions of this Agreement by reference and describe with specificity the additional financial and other terms and conditions that may be required by the individual program or project.

All activities under or pursuant to this Agreement are subject to the availability of appropriated funds and no provision shall be interpreted to require obligation or provision of funds in violation of the Anti-Deficiency Act, 31 U.S.C. §1341.

X. KEY PERSONNEL

The following personnel are designated as the key officials and or representatives for their respective party. These key officials are the principal points of contact between the parties in the performance of this Agreement:

For NASA KSC:

KSC Real Property Accountable Officer
Mail Code: TA-B4C
Kennedy Space Center, FL 32899

Phone: 321-867-8047
Fax: 321-861-7946

Chief, Environmental Management Branch
Mail Code: TA-A4C
Kennedy Space Center, FL 32899

Phone: 321-867-1599
Fax: 321-867-4446

For FWS:

Refuge Manager
P.O. Box 2683
Titusville, FL 32781

Phone: 321-861-0667
Fax: 321-861-1276

XI. TERM OF AGREEMENT AND RIGHT TO TERMINATE

This Agreement becomes effective on the date of the last signature of the parties. Either party, upon a 180-day written notice to the other party, may terminate this Agreement, without liability, at any time and for any reason it deems substantial.

Fixtures, equipment, facilities, or other property of the FWS constructed or maintained on the said premises shall be and remains the property of the FWS and may be removed at any time prior to the termination of this Agreement and at any time within 90 days after

RELEASED - Printed documents may be obsolete; validate prior to use.

any termination of this permit. Any property of the FWS not removed from the premises within three months after termination of this Agreement shall become the property of NASA.

This Agreement shall remain in effect until terminated by the parties. Annual reviews shall be conducted by the parties to ensure that the provisions of this Agreement remain current and accurately reflect the relationship of the parties.

XII. SIGNATORY AUTHORITY FOR MODIFICATIONS AND EXTENSIONS

1. Any modification to this Agreement shall be executed in writing and signed by an authorized representative of each party. Any modification which creates an additional commitment of NASA KSC resources must be signed by the original NASA KSC signatory authority, or successor, or a higher-level NASA KSC official possessing original or delegated authority to make such a commitment.

2. All requests by NASA KSC regarding modifications to or termination of this Agreement will be addressed to the Regional Director, U.S. Fish and Wildlife Service, at 1875 Century Boulevard, NE, Suite 400, Atlanta, GA 30345, and all such requests by the FWS will be addressed to the Director, NASA, Kennedy Space Center, Mail Code: AA, Kennedy Space Center, FL 32899.

3. For updates or changes to Appendix A of this Agreement, the parties hereby delegate the authority for that activity as follows: for the FWS, the Refuge Manager; and for NASA KSC, the Director, Center Operations. This authority does not extend to eliminating existing or creating additional appendices.

XIII. ASSIGNMENT OF RIGHTS

Neither this Agreement nor any interest arising under it will be assigned by FWS or NASA KSC without the express written consent of the officials executing the Agreement.

RELEASED - Printed documents may be obsolete; validate prior to use.

XIV. EXECUTION

This document has been executed in duplicate originals by the undersigned.

National Aeronautics and
Space Administration
JOHN F. KENNEDY SPACE CENTER

BY: Robert D Cabana
Robert D. Cabana
Director

Date: 29 JAN 12

Department of Interior
FISH AND WILDLIFE SERVICE

BY: Cindy Dohner
Cindy Dohner
Regional Director

Date: 7/25/2012

RELEASED - Printed documents may be obsolete; validate prior to use.

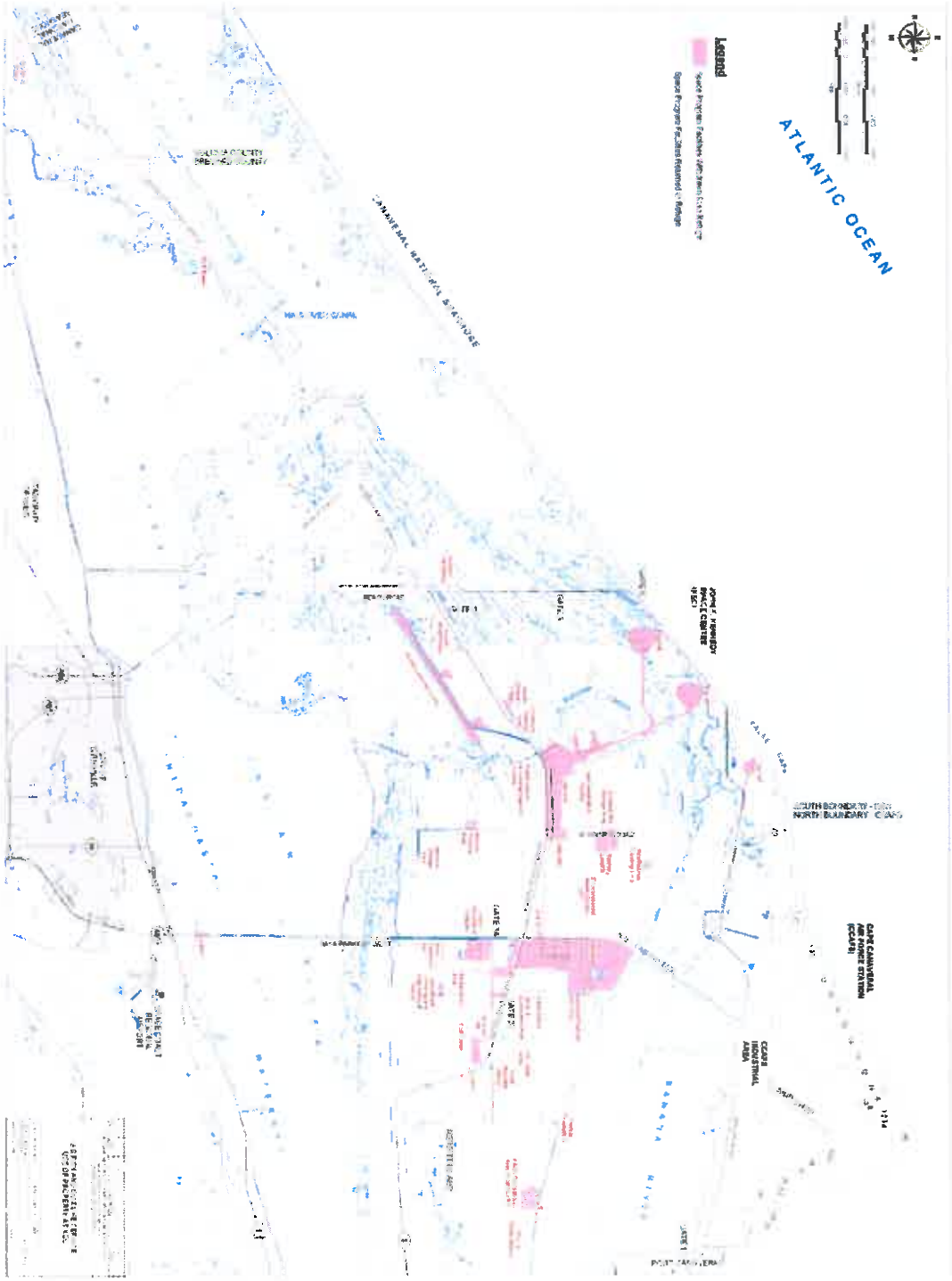
APPENDIX A

MAP: CANAVERAL NATIONAL SEASHORE
MERRITT ISLAND NATIONAL WILDLIFE REFUGE
APRIL 2012

RELEASED - Printed documents may be obsolete; validate prior to use.

APPENDIX A

MAP: CANAVERAL NATIONAL SEASHORE
MERRITT ISLAND NATIONAL WILDLIFE REFUGE
APRIL 2012



RELEASED - Printed documents may be obsolete; validate prior to use.

EXHIBIT 5-3
AGREEMENT BETWEEN NASA AND DOI FOR USE OF PROPERTY AT KSC, NASA AS A PART OF THE CANAVERAL NATIONAL SEASHORE

RELEASED - Printed documents may be obsolete; validate prior to use.

ATTAC MENT A to NMI 1052.188

KCA-4307
Rev. Basic

*AGREEMENT BETWEEN NATIONAL AERONAUTICS AND SPACE ADMINISTRATION AND DEPARTMENT OF THE INTERIOR FOR USE OF PROPERTY AT JOHN F. KENNEDY SPACE CENTER, NASA, AS A PART OF THE CANAVERAL NATIONAL SEASHORE

WHEREAS, the National Aeronautics and Space Administration has acquired certain lands and adjacent waters located in Brevard and Volusia Counties, Florida; and

WHEREAS, these lands include launch operation areas and necessary buffer zones; and

WHEREAS, a portion of these lands and adjacent waters have now been included within the boundaries of the Canaveral National Seashore by Public Law 93-626, 88 Stat. 2121; and

WHEREAS, the Congressional enactment requires the Administrator of the National Aeronautics and Space Administration to grant to the Secretary of the Interior such use and management authority of that portion of the John F. Kennedy Space Center included within the Canaveral National Seashore as the Administrator determines is not inconsistent with public safety and the needs of the space and defense programs of the Nation;

NOW, THEREFORE, the National Aeronautics and Space Administration (hereinafter called NASA) makes available to the Department of the Interior (hereinafter called the Department) for the purposes set forth in the Act and subject to the terms and conditions hereinafter set forth, all those lands, submerged lands and waters, comprising approximately 41,000 acres described in the Act and located within the perimeters of the John F. Kennedy Space Center, NASA (hereinafter called KSC), less and except those areas on which Space Program facilities have heretofore been constructed, as described in Attachment A hereto.

I. AREA I

That portion of KSC transferred by the Act to the Department, described in the Act as bounded by the northern boundary of the H. M. Gomez Grant and containing 1,088 acres more or less (hereinafter referred to as "Area I") which is

* This agreement implements Public Law 93-626 establishing the Canaveral National Seashore. NASA has been notified by the Department of the Interior that, pursuant to the last paragraph of this agreement, it is effective April 2, 1975. Thus, with respect to the lands described in this agreement, it supersedes the agreement of June 2, 1972 (NMI 1052.91A). That 1972 agreement, however, remains in effect for KSC lands not included within the Canaveral National Seashore.

RELEASED - Printed documents may be obsolete; validate prior to use.

depicted on Attachment B, shall be used in accordance with the Act for the purpose of establishing such facilities as are needed for the administration of the Seashore, for the construction of the principal Visitor Center and for a central access to the Seashore; Provided, however, that the siting and nature of any such construction shall be coordinated with KSC to assure consistency with public safety and with the needs of the space and defense programs of the Nation; and Provided, further, that the entire Area I or any part so transferred shall, upon request of the Director of KSC, be closed to the public when necessary for space operations.

II. AREA II

The Department shall enter upon and use the remainder of the property (comprising approximately 39,912 acres and hereinafter referred to as "Area II") which is depicted on Attachment B, covered by this Agreement for Seashore and Refuge purposes. The Department shall have primary administration over Area II for all purposes unrelated to the Space Program of the United States of America, subject to the following conditions:

1. Programs and/or activities of the Department shall be carried out on a basis of noninterference with the space and defense programs and any program or activity shall be terminated by the Department upon a determination by NASA of incompatibility with the space and defense programs; Provided, however, that prior to arriving at such a determination NASA shall obtain and consider the views of the Department.

2. The Department shall, upon request by the Director of KSC, close all or any part of Area II to the public during checkout, launch and landing periods or during emergencies involving safety and/or security of property and/or personnel; Provided, that NASA will furnish on request from the Department assistance on an as-available basis in such closing.

3. The use and occupation of Area II by the Department shall be without cost or expense to NASA, except as hereinafter provided.

4. NASA shall furnish fire protection in Area II at no cost to the Department, provided that in the event of controlled burning by the Department, control of such fire

RELEASED - Printed documents may be obsolete; validate prior to use.

shall be the primary responsibility of the Department and assistance by NASA shall be furnished on an as-available basis. Further, NASA may, at its discretion, continue to furnish telephone and electrical service, and when local and Department services are unavailable or insufficient to meet the need, secondary riot or other emergency police/property protection assistance, and secondary emergency medical/ambulance service in Area II; Provided, that NASA will not alter policies in this regard without adequate notice to the Department which would give the Department a reasonable time to obtain replacement services.

5. The Department is authorized to construct, alter, operate and maintain dikes, impoundments, subimpoundments, and water control structures in Area II which do not interfere with or adversely affect NASA operations. These activities will be coordinated with KSC and the Brevard Mosquito Control District to assure an effective mosquito control program which as nearly as possible is compatible with good recreational, wildlife, and habitat management of the area.

6. The Department is authorized to construct, alter and maintain in Area II those facilities needed to accommodate the health, safety, and recreation needs of the visiting public, which do not interfere with or adversely affect NASA operations. Siting of any such construction shall be subject to approval by KSC in accordance with the public safety and the needs of the space and defense programs of the Nation. All such construction shall meet NASA building and fire standards for comparable buildings.

7. The appropriate Services within the Department may make and enforce such rules and regulations as are necessary, and within their respective legal authority, in exercising the privileges granted in this Agreement; Provided, however, that rules and regulations prescribed by NASA to govern the use of the Space Center shall be controlling in all matters pertaining to the Space Program of the United States, particularly with respect to such matters as security, safety, over-flights and radio/instrumentation interference. NASA and the Department shall coordinate the promulgation of regulations concerning public use of Area II.

8. NASA reserves the right to site any future Space Program facility at any location in Area II, but in such siting, as well as other Space Program operations, NASA

RELEASED - Printed documents may be obsolete; validate prior to use.

will take under consideration the Department's utilization and administration of said property in order to insure compatibility of NASA activities with those of the Department wherever practicable.

9. The Department shall, at its own expense and without cost or expense to NASA, preserve, maintain, and keep in good repair and condition the premises made a part of the Seashore; Provided, however, that NASA shall continue to maintain all existing cemeteries.

10. The Department, its employees, contractors, and the public are authorized to use State Road 3, State Road 402 and Camera Pad Road for access to the Seashore; Provided, however, that the public shall be excluded from use thereof when such roads are closed for space operations. NASA shall maintain State Road 3 and State Road 402 (including associated railroad crossings, traffic signals, bridges and drainage ditches), less and except that portion of State Highway 3 (Kennedy Parkway) abutting Area I, maintenance of which shall be the sole responsibility of the Department; Provided, that NASA may agree to provide maintenance of such portion to the Department on a reimbursable basis. Further, in the event a traffic increase attributable to the creation of the Seashore results in increased deterioration of other portions of State Road 3 (Kennedy Parkway) and/or State Road 402 (Beach Road) serving both NASA and the Deparment, the Department shall reimburse NASA for a proportionate share of the cost of maintenance thereof, subject to agreement between NASA and the Department concerning the proportionate share allocable to each of the parties. Further, NASA shall continue to maintain Camera Pad Road leading from State Road 402 to Camera Pads 9 and 10, to the extent necessary for space programs; Provided, that in the event the Department desires to open this road to use by the public for access to portions of the Seashore the Department shall reimburse NASA for all maintenance required on such road for that purpose, subject to agreement between NASA and the Department in such event.

11. The Department shall fund for and provide any and all facilities constructed, maintained or used by the Services in their programs.

12. The use of Area II by the Department shall be subject to all valid easements, rights-of-way, licenses, and present or future interests in, upon, across, or through

RELEASED - Printed documents may be obsolete; validate prior to use.

said property granted by NASA for purposes related to the Space Program; Provided, however, that prior to granting any future interests in the Seashore, NASA shall obtain and consider the views of the Department with respect to the design, nature and location thereof. Out-grants which are unrelated to the Space Program and the primary administration and management thereof shall be the responsibility of the Department; Provided, however, that the Department shall to the fullest extent feasible, follow the policy of out-leasing citrus groves in order that such groves may be continued in an operational status.

13. The right is hereby expressly reserved to NASA, its officers, agents, employees, grantees and contractors to enter upon Area II at any time and to make any use of said land which may be necessary in connection with the Space Program of the United States.

14. The Department shall cooperate to the fullest extent possible with the Brevard Mosquito Control District for the suppression and control of arthropod production in that portion of the Seashore covered by this Agreement, under terms and conditions, including funding arrangements, as may be agreed to in any agreement with the District.

15. Any agreement between the Department and any other government agency concerning the use or occupancy of Area II shall be subject to prior approval by KSC in accordance with the public safety and the needs of the space and defense programs of the Nation. Except as specifically otherwise authorized by law, NASA shall be the sole interface with the Department of Defense concerning use or occupancy of any portion of Area II by the Department of Defense.

16. Fixtures, equipment, facilities, or other property of the Department constructed or maintained on Area II shall be and remain property of the Department and may be removed at any time prior to the termination of this Agreement and at any time within three months after such termination. Any property of the Department not removed from the premises within three months after termination of the Agreement shall become property of NASA.

III. GENERAL PROVISIONS

1. In order to insure the greatest possible compatibility between the Space Program and the National

RELEASED - Printed documents may be obsolete; validate prior to use.

Seashore, the parties hereto shall meet at least once annually and communicate from time to time on matters of mutual concern and interest.

2. In making its review of the area within the Seashore as to the suitability of any portion thereof for preservation as wilderness, as required by Section 8 of the Act, the Department shall obtain and consider the views of NASA and, prior to giving any public notice with respect to a Departmental recommendation of suitability for preservation, shall notify NASA of its intention to make such a recommendation.

3. All notices by NASA to the Department concerning this Agreement will be addressed to the Refuge Manager, Merritt Island Wildlife Refuge, Florida 32780, and the Superintendent, Canaveral National Seashore, National Park Service, and all notices by the Department to NASA will be addressed to Director, John F. Kennedy Space Center, NASA, Kennedy Space Center, Florida 32899.

4. Notwithstanding any other provision of this Agreement, implementation of the Agreement and any obligation hereunder shall be subject to the availability of appropriated funds.

5. This Agreement may be amended at any time upon mutual consent of the parties.

6. This Agreement may be terminated as to Area II in whole or in part in the event the Administrator determines that use of Area II as a Seashore is inconsistent with public safety and the needs of the space and defense programs of the Nation; Provided, however, that the Administrator shall make no such determination without first obtaining and considering the views of the Department.

This Agreement shall become effective when executed on behalf of both parties and shall remain in effect until terminated or amended as provided herein. With respect to Area II, upon notification to NASA of implementation hereof by the Department, this Agreement will supersede the Agreement of June 2, 1972,[1] between NASA and the Department for use of property at the John F. Kennedy Space Center, NASA, by the Bureau of Sport Fisheries and Wildlife to the extent that property included in the 1972 Agreement has been incorporated

1/ See NMI 1052.91A.

RELEASED - Printed documents may be obsolete; validate prior to use.

into the Canaveral National Seashore and is covered by the terms and conditions of this Agreement. In the meantime, NASA and the Department agree to continue operation under said Agreement of June 2, 1972.[1]

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

Associate Administrator for Center Operations

Date: [illegible]

DEPARTMENT OF THE INTERIOR

Assistant Secretary of the Interior

Date: 4/2/75

[1] See NMI 1052.91A

RELEASED - Printed documents may be obsolete; validate prior to use.

ATTACHMENT "A"

Camera Pad 9

Camera Pad 10

Weather Station 10

KSC constructed railroad

State Highway 3 - Kennedy Parkway
(from northern boundary south to the intersection with State Road 402)

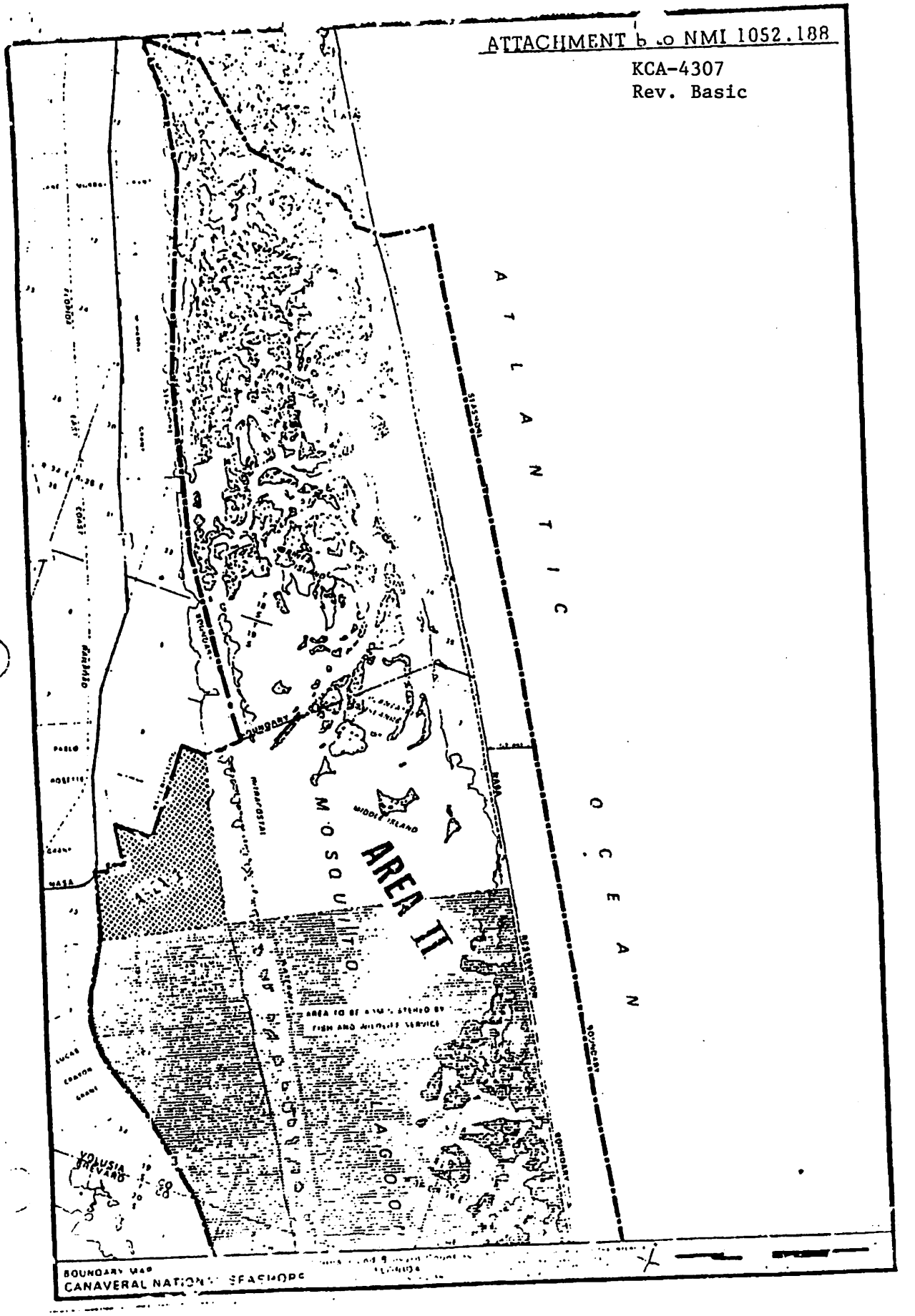
State Highway 402 - Beach Road
(from intersection with State Road 3 east to the beach)

Camera Pad Road
(from State Highway 402 north to Camera Pads 9 and 10)

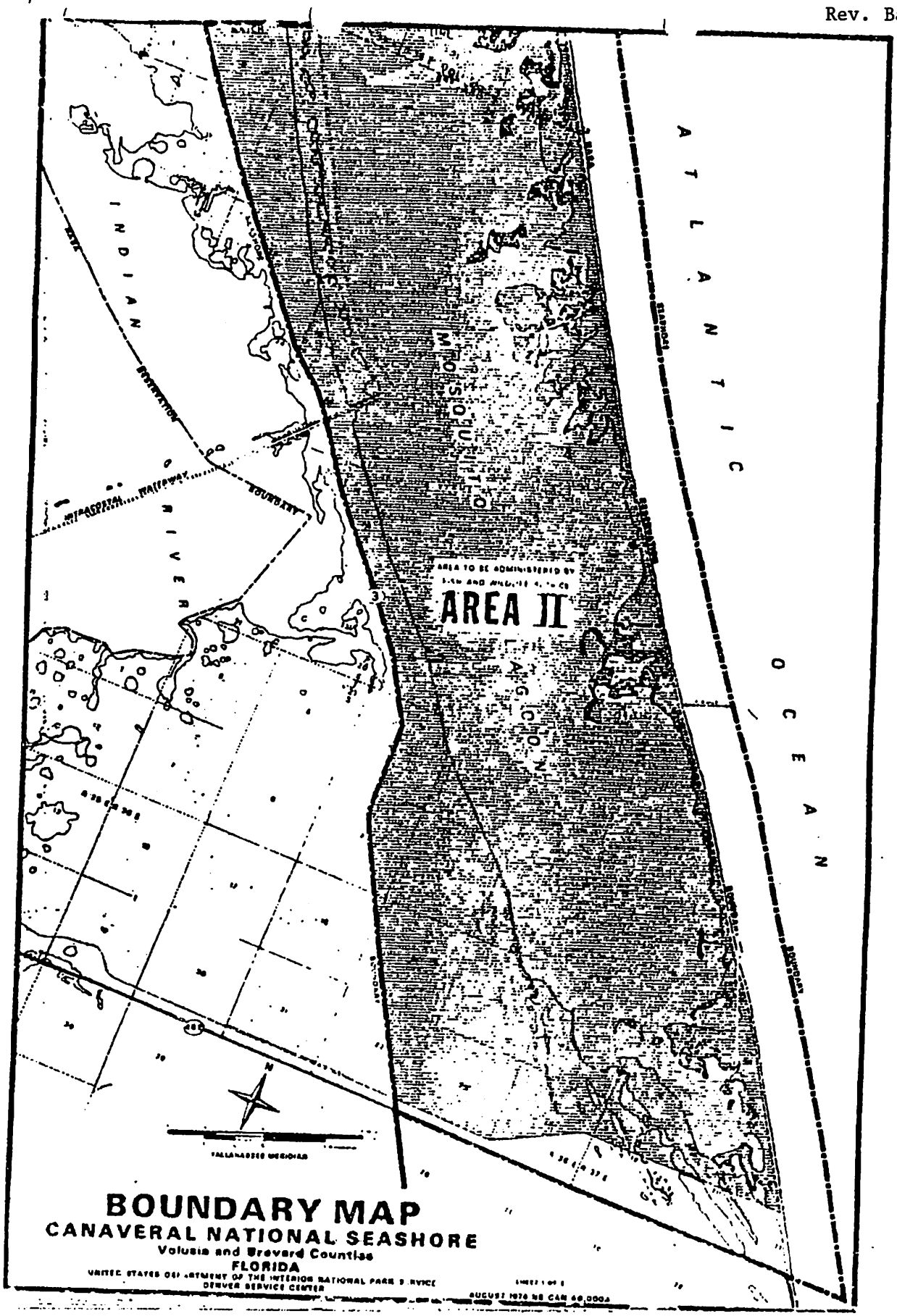
RELEASED - Printed documents may be obsolete; validate prior to use.

ATTACHMENT b to NMI 1052.188

KCA-4307
Rev. Basic



RELEASED - Printed documents may be obsolete; validate prior to use.



RELEASED - Printed documents may be obsolete; validate prior to use.

NMI 1052.188

April 2, 1975
Effective date

Responsible Office: AC/Center Operations

Management Instruction

* SUBJECT: NASA-INTERIOR AGREEMENT USE OF PROPERTY AT KENNEDY SPACE CENTER, AS PART OF CANAVERAL NATIONAL SEASHORE

1. PURPOSE

This Instruction incorporates into the NASA Issuance System as Attachment A the Agreement Between the National Aeronautics and Space Administration and the Department of the Interior for Use of Property at John F. Kennedy Space Center, NASA, as a Part of the Canaveral National Seashore.

Angela M. Murphy

Angela M. Murphy,
Chief, Management Issuances &
Information Branch
Administrative Services Division

DISTRIBUTION:
SDL 1

* This agreement implements Public Law 93-626 establishing the Canaveral National Seashore. NASA has been notified by the Department of the Interior that, pursuant to the last paragraph of this agreement, it is effective April 2, 1975. Thus, with respect to the lands described in this agreement, it supersedes the agreement of June 2, 1972 (NMI 1052.91A). That 1972 agreement, however, remains in effect for KSC lands not included within the Canaveral National Seashore.

RELEASED - Printed documents may be obsolete; validate prior to use.

EXHIBIT 5-4
KSC ARCHAEOLOGICAL RESOURCES LOAN AGREEMENTS WITH CNS

RELEASED - Printed documents may be obsolete; validate prior to use.

US Department of the Interior
National Park Service

Incoming Loan Extension

Accession No. CANA-00096

NPS Unit (Borrower): Canaveral National Seashore
(Street/Box)212 S. Washington Ave.
Telephone: 321-267-1110

(City/State/Zip)Titusville, FL 32796
Fax Number:

LENDER: NASA (Kennedy Space Center)

(Department)
(Street/Box)
Telephone:321-867-1599

(City, State, Zip, Country)
Fax Number:

Responsible Official (Lender):Denise Thaller
Title:Chief Environmental Management Branch

LOAN DATES:
Original initiation date of loan agreement:11/01/2001
Original termination date of loan agreement:11/01/2003
Length of extension requested: 7/10/2015

ITEMS IN LOAN: Artifacts and documentation from Futch Cove Site (8BR170)
CANA-96, (SEAC-1743)

EXTENSION REQUEST:
Borrower requests permission to extend the duration of the Incoming Loan Agreement.

Extension Requested by: Myrna Palfrey-Perez Myrna D. Palfrey 4-25-11
Signature of Superintendent Date

EXTENSION APPROVED OR DENIED:
Length of Extension granted: Extended termination date:7/10/2015

Extension granted by: Denise Thaller 5-4-11
Signature of Lender Date

☐ Extension not granted. Provide explanation:

PREVIOUS EXTENSIONS AND COMMENTS:
Previous Extensions: 11/01/2003 – 7/13/2005, 7/13/2005 – 7/10/2008, 7/10/2008 – 7/10/2011
Additional Conditions/Comments:

NPS Form 10-98b
May 2006

RELEASED - Printed documents may be obsolete; validate prior to use.

US Department of the Interior
National Park Service

Incoming Loan Extension

Accession No. CANA-00097

NPS Unit (Borrower): Canaveral National Seashore
(Street/Box)212 S. Washington Ave.
Telephone: 321-267-1110

(City/State/Zip)Titusville, FL 32796
Fax Number:

LENDER: NASA (Kennedy Space Center)

(Department)
(Street/Box)
Telephone:321-867-1599

(City, State, Zip, Country)
Fax Number:

Responsible Official (Lender):Denise Thaller
Title:Chief Environmental Management Branch

LOAN DATES:
Original initiation date of loan agreement:11/01/2001
Original termination date of loan agreement:11/01/2003
Length of extension requested: 7/10/2015

ITEMS IN LOAN: Artifacts and field documentation from the archeological survey of KSC Option Areas 1,2, and 3 1991-1992.
CANA-97, (SEAC-1744)
Catalog Numbers 14588-15046, 16491-16493

EXTENSION REQUEST:
Borrower requests permission to extend the duration of the Incoming Loan Agreement.

Extension Requested by: Myrna Palfrey-Perez Myrna S. Palfrey 4-25-11
Signature of Superintendent Date

EXTENSION APPROVED OR DENIED:
Length of Extension granted: Extended termination date:7/10/2015

Extension granted by: Denise Thaller 5-4-11
Signature of Lender Date

☐ Extension not granted. Provide explanation:

PREVIOUS EXTENSIONS AND COMMENTS:
Previous Extensions: 11/01/2003 – 7/13/2005, 7/13/2005 – 7/10/2008, 7/10/2008 – 7/10/2011
Additional Conditions/Comments:

NPS Form 10-98b
May 2006

RELEASED - Printed documents may be obsolete; validate prior to use.

US Department of the Interior
National Park Service

Incoming Loan Extension

Accession No. CANA-00098

NPS Unit (Borrower): Canaveral National Seashore
(Street/Box)212 S. Washington Ave. Telephone: 321-267-1110

(City/State/Zip)Titusville, FL 32796 Fax Number:

LENDER: NASA (Kennedy Space Center)

(Department)
(Street/Box) Telephone:321-867-1599

(City, State, Zip, Country) Fax Number:
Responsible Official (Lender):Denise Thaller Title:Chief Environmental Management Branch

LOAN DATES:
Original initiation date of loan agreement:11/01/2001
Original termination date of loan agreement:11/01/2003
Length of extension requested: 7/10/2015

ITEMS IN LOAN: Artifacts and field documentation from the archeological survey of KSC north area.
1994
CANA-98, (SEAC-1745)
Catalog Numbers 15047-15987

EXTENSION REQUEST:
Borrower requests permission to extend the duration of the Incoming Loan Agreement.

Extension Requested by: Myrna Palfrey-Perez Myrna S. Palfrey 4-25-11
Signature of Superintendent Date

EXTENSION APPROVED OR DENIED:
Length of Extension granted: Extended termination date:7/10/2015

Extension granted by: Denise Thaller 5-4-11
Signature of Lender Date

☐ Extension not granted. Provide explanation:

PREVIOUS EXTENSIONS AND COMMENTS:

Previous Extensions: 11/01/2003 – 7/13/2005, 7/13/2005 – 7/10/2008, 7/10/2008 – 7/10/2011

Additional Conditions/Comments:

NPS Form 10-98b
May 2006

RELEASED - Printed documents may be obsolete; validate prior to use.

EXHIBIT 5-5
SECRETARY OF THE INTERIOR'S STANDARDS FOR REHABILITATION
(36 CFR Part 67)

RELEASED - Printed documents may be obsolete; validate prior to use.

The Secretary of the Interior's Standards for Rehabilitation (36 CFR Part 67)

The Secretary of the Interior's Standards for Rehabilitation are ten basic principles created to help preserve the distinctive character of a historic building and its site, while allowing for reasonable change to meet new needs. The Standards apply to historic buildings of all periods, styles, types, materials, and sizes. They apply to both the exterior and the interior of historic buildings. The Standards also encompass related landscape features and the building's site and environment as well as attached, adjacent, or related new construction.

The Standards are applied to projects in a reasonable manner, taking into consideration economic and technical feasibility.

1. A property shall be used for its historic purpose or be placed in a new use that requires minimal change to the defining characteristics of the building and its site and environment.

2. The historic character of a property shall be retained and preserved. The removal of historic materials or alteration of features and spaces that characterize a property shall be avoided.

3. Each property shall be recognized as a physical record of its time, place, and use. Changes that create a false sense of historical development, such as adding conjectural features or architectural elements from other buildings, shall not be undertaken.

4. Most properties change over time; those changes that have acquired historic significance in their own right shall be retained and preserved.

5. Distinctive features, finishes, and construction techniques or examples of craftsmanship that characterize a historic property shall be preserved.

6. Deteriorated historic features shall be repaired rather than replaced. Where the severity of deterioration requires replacement of a distinctive feature, the new feature shall match the old in design, color, texture, and other visual qualities and, where possible, materials. Replacement of missing features shall be substantiated by documentary, physical, or pictorial evidence.

7. Chemical or physical treatments, such as sandblasting, that cause damage to historic materials shall not be used. The surface cleaning of structures, if appropriate, shall be undertaken using the gentlest means possible.

8. Significant archeological resources affected by a project shall be protected and preserved. If such resources must be disturbed, mitigation measures shall be undertaken.

9. New additions, exterior alterations, or related new construction shall not destroy historic materials that characterize the property. The new work shall be differentiated from the old and shall be compatible with the massing, size, scale, and architectural features to protect the historic integrity of the property and its environment.

RELEASED - Printed documents may be obsolete; validate prior to use.

10. New additions and adjacent or related new construction shall be undertaken in such a manner that if removed in the future, the essential form and integrity of the historic property and its environment would be unimpaired.

RELEASED - Printed documents may be obsolete; validate prior to use.

Chapter 6.0 STANDARD OPERATING PROCEDURES

6.1 INTRODUCTION

This Chapter provides a set of prescribed **Standard Operating Procedures (SOPs)** for the ongoing identification, evaluation, treatment, and preservation of significant historic properties (including archaeological sites and historic facilities) at KSC, in compliance with Sections 106 and 110 of the NHPA, and in accordance with other federal laws, regulations, and guidelines; NASA policies; and state standards for historic preservation projects.

The SOPs include a variety of activities that involve cultural resources, from planned identification and evaluation surveys to procedures in response to inadvertent discoveries. Each SOP follows a format, which includes the initial goals and objectives, triggering events, the principal participants, as well as the specific steps to follow. In some cases, example scenarios are offered.

This guide is intended for use by the HPO and other NASA and contractor personnel actively engaged in CRM activities at KSC. The HPO is KSC's lead in Section 106 and 110 processes and all other activities regarding cultural resource management. The HPO also serves as the single point of contact between KSC and the SHPO. For all the SOPs described in this chapter, the HPO defines the undertaking, notifies and consults with representatives of Florida's federally-recognized Indian Tribes and other interested parties, prepares SOWs and contracts for professional services, if needed, and ensures that all documentation submitted by contractors meets the requirements of pertinent federal and state laws and regulations.

6.2 STANDARD OPERATING PROCEDURES

The SOPs discussed in this chapter include the following:

- SOP #1: Project Review for New Undertakings
- SOP #2: Assessment and Resolution of Adverse Effects
- SOP #3: Public Participation in the Section 106 Consultation Process
- SOP #4: Native American Consultation
- SOP #5: Unanticipated Discoveries of Archaeological Materials
- SOP #6: Inadvertent Discoveries of Human Remains
- SOP #7: Phase I Archaeological Survey
- SOP #8: Phase II Test Excavation
- SOP #9: Phase III Mitigative Excavation and Data Recovery
- SOP #10: Archaeological Collections Management
- SOP #11: Identification and Evaluation of Historic Properties
- SOP #12: HABS/HAER Documentation
- SOP #13: Administrative Tasks for Completing Data Calls and Uploading Correspondence and Documentation into the CRM Nets Module

RELEASED - Printed documents may be obsolete; validate prior to use.

SOP #1: PROJECT REVIEW FOR NEW UNDERTAKINGS	**Page 1**
Goals and Objectives	1. Determine whether a proposed project or action is an undertaking subject to Section 106 or Section 110 review. 2. Determine whether the undertaking has the potential to cause effects to significant archaeological sites and historic properties.
Triggering Event	NEPA Compliance (KSC Environmental Checklist), Section 106, Section 110, and Remediation Projects.
Participants	Project proponent, EMB, HPO, SHPO, Native American tribal representatives, and interested parties.
Action Plan/Step 1: KSC Environmental Checklist	1. The project proponent completes the KSC Environmental Checklist (EC), KSC Form 21-608V2 NS (rev 01/08), by submitting maps and a project description of the undertaking. The EC process flow chart is illustrated in KDP-P-1727 (**Figure 1-4**). Completion of the checklist (**Exhibit 6-1**) begins the process of environmental review by the KSC EMB. 2. The EC electronic form filler, PDF or Word document form can be downloaded from the KSC Environmental Program website NEPA page. The EMB evaluates the proposed project and develops a Record of Environmental Consideration (REC) (**Exhibit 6-2**), which provides a summary of environmental requirements associated with the project. The REC sets the permitting and non-permitting requirements that must be met to assure compliance with all environmental laws and regulations, including the level of documentation (e.g., EA, EIS). 3. The REC is part of the NEPA process, but it includes more environmental requirements or recommendations than those related to NEPA regulations.
Project Review for Archaeological Sites	1. The project proponent completes the EC and submits it along with all required maps, project scope, and description to the EMB to determine impacts of the planned action including those to archaeological sites and historical areas. 2. The EMB reviews the completed EC form and forwards it to the HPO for review and concurrence. After consolidating all the impacts, the EMB prepares a REC and distributes it to the project proponent and other interested parties. 3. If Item 10.b, "Land Impacts," is checked on the EC form (includes "land disturbance, soil addition or removal, digging, grading, trenching, alteration, or removal of vegetation"), the EMB checks the GIS predictive model maps to determine if the proposed project falls within a **"High"** or **"Moderate" ZAP** or whether it is situated **within or adjacent to a recorded archaeological site**. If either situation is applicable, the HPO will **consult with the SHPO t**o determine whether the project warrants a Phase I archaeological survey in compliance with Section 106 of the NHPA. 4. If a Phase I survey is required, the Project Proponent is informed. The HPO prepares a SOW for such an investigation and retains the services of a professional CRM contractor. The requirements for a Phase I survey are provided in SOP #7, Phase I Archaeological Survey. 5. If the proposed action is **not in a ZAP,** or is located **within or adjacent to an archaeological site or historical area** assessed to be **ineligible** for NRHP listing, **no further review is required**, in accordance with prior SHPO clearance resulting from the KSC-wide Archaeological Survey.

RELEASED - Printed documents may be obsolete; validate prior to use.

SOP #1: PROJECT REVIEW FOR NEW UNDERTAKINGS (cont.).	**Page 2**
Project Review for Historic Properties	1. If Item 10.a, "Construction/Modification/Demolition," is checked on the EC form, the HPO evaluates whether the project or action has the potential to affect a property that is listed or eligible for listing in the NRHP. If the facility is **not listed or eligible**, the HPO may need to see SOP #11, Identification and Evaluation of Historic Property. 2. If the facility **is listed or eligible** as a historic property, the HPO initiates an **assessment of effect**, as detailed in SOP #2, Assessment and Resolution of Adverse Effects.
Action Plan/Step 2: Initiating the Section 106 Process	1. If the HPO determines that there is **no undertaking/no potential to cause effects**, the review process is completed. KSC has no further obligations under Section 106. 2. If the HPO determines that there is an **undertaking with the potential to cause effects**, consultation with the SHPO and representatives of the federally-recognized Native American tribes (see SOP #4, Native American Consultation) is initiated and other potential consulting parties are identified. The public is afforded the opportunity to receive information on the project and to express their views (see SOP #3, Public Participation in the Section 106 Consultation Process). 3. The HPO prepares a SOW for the identification and evaluation of historic properties, including archaeological sites and historic resources, within the project APE, and contracts for the needed services with a CRM professional meeting the Secretary of the Interior's standards. 4. The CRM Contractor prepares a draft Cultural Resources Assessment Survey (CRAS) or Historic Survey for the HPO's review and comment. 5. The HPO submits comments back to the CRM Contractor on the draft CRAS or Historic Survey to be finalized. 6. The CRM Contractor provides a final CRAS or Historic Survey to the HPO. 7. The HPO submits the final CRAS or Historic Survey to the SHPO for review and concurrence. 8. If the HPO determines that **no historic properties are affected** within the CRAS, then barring any objection within **30 days**, KSC may **proceed with the undertaking**. 9. If any archaeological sites, historic areas, or historic properties are identified and the HPO determines that the proposed project or action has the **potential to cause effects**, KSC in consultation with the SHPO and any other consulting parties **must find that "Historic Properties Are Affected"** and initiate SOP #2, Assessment and Resolution of Adverse Effects.

RELEASED - Printed documents may be obsolete; validate prior to use.

SOP #1: PROJECT REVIEW FOR NEW UNDERTAKINGS (cont.).	**Page 3**
Example Scenarios	1. **Routine maintenance** to an NRHP-eligible historic property is proposed. Under the terms of the PA, routine maintenance is categorically excluded from Section 106 review since it has little or no potential to alter the characteristics, which make the historic property significant (see Section 5.3.2, Section 106 Review, Table 5-1, NASA KSC Actions that do not require Section 106 Consultation). 2. **New construction** is proposed. Initial project review indicates that the APE contains no recorded archaeological sites, no ZAPs, no historic properties, and no impacts to historic areas. No further action under Section 106 is required. The project may proceed. 3. Project review indicates that the APE contains a "**Moderate**" ZAP and a Phase I archaeological survey was conducted. This investigation resulted in the identification of six new archaeological sites. None were eligible for listing in the NRHP. Conclude that no historic properties are affected. The SHPO has **30 days** to review and comment on the survey. If the SHPO concurs with the survey findings, proceed with the project. 4. Proposed facility modifications will result in the demolition of three buildings that are contributing resources within an NRHP-eligible historic district. Conclude that historic properties are affected and begin the assessment of effects in consultation with the SHPO per SOP #2, Assessment and Resolution of Adverse Effects.

RELEASED - Printed documents may be obsolete; validate prior to use.

SOP #2: ASSESSMENT AND RESOLUTION OF ADVERSE EFFECTS	**Page 1**
Goals and Objectives	After archaeological sites and historic properties have been identified within the project APE, the HPO, in consultation with the SHPO, determines if the effects (direct, indirect, and cumulative) will be adverse, and if so, how the effects may be resolved.
Triggering Event	Section 106 of the NHPA. Cultural resources may be affected.
Participants	Project Proponent, HPO, FWS, CNS, SHPO, and the ACHP, as well as any interested parties.
Action Plan/Step 1: Assessing Adverse Effects	The HPO applies the Programmatic Agreement for Management of Historic Properties developed among NASA KSC, SHPO, and the ACHP and signed in May 2009; and the Criteria of Adverse Effect, 36 CFR Part 800.5(a)(1), and determines whether there is an adverse effect, pursuant to 36 CFR Part 800.5(a)(2) (see Section 1.4.3 Assess Adverse Effects, page 1-12). **No Adverse Effects**: 1. If the undertaking <u>does not</u> meet any of these criteria, the HPO makes a finding of **No Adverse Effect** and provides the pertinent information to the SHPO, pursuant to 36 CFR Part 800.11(e), and interested parties upon request. 2. The SHPO has **30 days** from receipt to review the findings. Failure of the SHPO to respond within **30 days** from receipt of the documentation permits the HPO to assume concurrence, pursuant to 36 CFR Part 800.5.(c)(1). 3. If the HPO and SHPO **agree** on the finding of **No Adverse Effects,** KSC has fulfilled its responsibilities under Section 106 and the project may proceed. **Adverse Effects**: 1. If the HPO and SHPO **agree** that historic properties are adversely affected, go to Step 2 below, Resolving Adverse Effects. 2. If the HPO and SHPO **disagree** on the determination within the **30**-day review period, the HPO can either continue consultation with the SHPO to resolve the adverse effects or request the ACHP to participate in the consultation process (36 CFR Part 800.5(c)(2)(i)).
Action Plan/Step 2: Resolving Adverse Effects for Historic Facilities	The HPO applies the Programmatic Agreement for Management of Historic Properties to determine the appropriate mitigation measure(s).
Action Plan/Step 2: Resolving Adverse Effects to NRHP-listed or Eligible Archaeological Sites	1. The HPO continues consultation with the SHPO and other interested parties to resolve the adverse effects by avoidance, minimization, or mitigation and considers alternatives to the project. 2. The ACHP is invited to participate or can decide to enter into consultation, pursuant to 36 CFR Part 800, Appendix A. The ACHP has **15 days** to notify the Agency and copy the HPO and consulting parties whether they will participate in the adverse effect resolution.

RELEASED - Printed documents may be obsolete; validate prior to use.

SOP #2: ASSESSMENT AND RESOLUTION OF ADVERSE EFFECTS (cont.).	**Page 2**
Action Plan/Step 2: Resolving Adverse Effects to NRHP-listed or Eligible Archaeological Sites (cont.)	3. If the ACHP does not participate and the HPO and the SHPO agree on the ways to resolve adverse effects, the measures are outlined in an MOA or other formal agreement document such as a "**Conditional No Adverse Effect**" determination pursuant to 36 CFR Part 800.5(b) and follows #4 - #8 below. If they fail to agree, proceed to #9 below. 4. The HPO drafts an MOA (reference Chapter 1, Section 1.4.4 Resolve Adverse Effects, page 1-15) or another appropriate agreement document and coordinates the document with all parties affected (including project proponent) as well as the KSC Legal Office. 5. Following review and revision(s), the final MOA or agreement document is executed by the Center Director or the HPO depending on the level of documentation. 6. The signed MOA or agreement document is sent to the SHPO for execution; a copy of the MOA or agreement document is provided to all interested parties (including the project proponent and ACHP). 7. An original copy of the MOA is provided to the KSC Legal Office for official files and is also uploaded to Agency Read Only Agreement Search for employee reference. 8. The HPO prepares a SOW to meet the terms of the MOA or agreement document and retains the services of a qualified CRM contractor to conduct the mitigation measures in coordination with the project proponent. 9. Continue with the Action Plan in SOP #9, Phase III Mitigative Excavation and Data Recovery. 10. The proposed undertaking proceeds according to the MOA or agreement document terms and/or stipulations. The HPO has met all of its obligations under the NHPA, Section 106 process. 11. If the HPO **does not** accept the SHPO's conditions or if the HPO and the SHPO **fail to agree**, the HPO requests comments from the ACHP and forwards a copy of the documentation package pursuant to 36 CFR Part 800.11(3) along with other information relevant to the disagreement. 12. The ACHP has **45 days** to comment. The ACHP's comments are provided to the NASA Administrator with copies to the FPO, KSC Center Director, HPO, and all consulting parties. 13. If the ACHP **terminates** consultation, they will notify the NASA Administrator, FPO, HPO, and consulting parties pursuant to 36 CFR Part 800.7(c). 14. The NASA Administrator/FPO takes into account the ACHP's comments, and the Center Director/HPO must consider their comments. The Center Director/HPO may choose to implement or not implement the comments.

RELEASED - Printed documents may be obsolete; validate prior to use.

SOP #2: ASSESSMENT AND RESOLUTION OF ADVERSE EFFECTS (cont.).	**Page 3**
	15. The HPO documents the final decision in accordance with 36 CFR Part 800.7(c)(4), all consulting parties are notified, and the project may proceed. 16. All documentation, correspondence, and other records regarding the process shall be retained and filed by the HPO and entered into the NETS CRM module.
What is the appropriate form of agreement document to prepare?	KSC's PA for Management of Historic Properties contains stipulations for mitigation measures that cover all situations where demolition, major alterations, or other actions resulting in adverse effects to NRHP listed or eligible historic facilities cannot be avoided. Therefore, preparation of an MOA for each undertaking is not needed. For significant archaeological sites or historic areas where avoidance is not feasible, an MOA is the most appropriate type of agreement document. Standard stipulates for an MOA are available on the National Preservation Institute website. The MOA signatories are able to terminate or amend the MOA. Concurring parties do not have this right. Their signature of the document simply shows their familiarity with the terms of the agreement.

RELEASED - Printed documents may be obsolete; validate prior to use.

SOP #3: PUBLIC PARTICIPATION IN THE SECTION 106 CONSULTATION PROCESS	
Goals and Objectives	To seek and consider the views of the public for undertakings that may have an effect on archaeological sites, historic areas, or historic properties. Public participation in the Section 106 consultation process will assist in the identification of issues, enhance the decision-making process, minimize project delays, and foster community support.
Triggering Event	Compliance with the NHPA and its implementing regulations during all steps of the Section 106 process (**Figure 1-2**), consistent with 36 CFR Part 800.2(d), including project development and initial review (pursuant to Part 800.3), identification and evaluation of historic properties (800.4), and the resolution of adverse effects (800.6). NEPA scoping and project review. Compliance with the Section 106 public involvement requirements may be coordinated with NEPA. Although NEPA does not require that public comments be gathered during the EA process, KSC considers such involvement to be in the best interests of both the public and the mission. Public scoping is required during the EIS process.
Participants	HPO, Project Proponent, Environmental Lead, Contractor, and Public. The public-sector stakeholders generally include local governments, historical and archaeological societies, historic preservation groups (**Exhibit 6-3**), and other special interest groups, and land users (e.g., recreational boaters, birders).
Action Plan	1. The HPO will identify all parties that may be reasonably expected to have an interest in the undertaking and will provide project specific information to all interested parties and the public as a means of notification and an invitation to participate in the consultation. In addition to a brief description of the undertaking, a copy of the relevant SHPO correspondence may be included. **Be sure NOT to include the locations of any archaeological sites.** Any member of the public can request that the HPO include them as a consulting party. 2. The HPO will develop and maintain a memorandum for the record which includes a summary of the parties contacted, the means of contact (e.g., telephone, email, formal letter), dates, and pertinent information. Include copies of correspondence and file with other associated project materials.
What are the specific ways to involve the public?	1. Notification in local newspapers (e.g., Florida Today and the Daytona Beach News Journal). 2. Announcements on KSC website created for the project. In addition to the initial public notification regarding the purpose and need for the project, cultural resource documents such as survey reports, and agreement documents can be made available on the website for review by interested parties. 3. Letters, emails, or telephone calls to individuals and groups. 4. Workshops and public hearing as part of the NEPA process. Usually there are two stages in the NEPA process where public input is solicited: (a) during scoping and (b) after the draft EA or EIS has been prepared.

RELEASED - Printed documents may be obsolete; validate prior to use.

SOP #4: NATIVE AMERICAN CONSULTATION	**Page 1**
Goals and Objectives	To comply with all federal laws, Executive Orders, and regulations that require consultation with Indian (Native American) tribes that attach religious and cultural significance to archaeological sites, historic areas, and historic properties that may be affected by an undertaking or other circumstances. These authorities include: **Federal Laws:** • NHPA of 1966, as amended • AIRFA of 1978 • NAGPRA of 1990 • ARPA of 1979 **Executive Orders:** • Executive Memorandum, April 29, 1994: Government-to-Government Relations with Native American Tribal Government • EO 13007: Indian Sacred Sites, May 24, 1996 • EO 13175: Consultation and Coordination with Indian Tribal Governments, 2000 **Regulations:** • ACHP's "Protection of Historic Properties" (36 CFR Part 800) • NAGPRA Regulations (43 CFR Part 10)
Triggering Event	1. All phases of the Section 106 review process (**Figure 1-2**), including project development and initial review; identification and evaluation of archaeological sites, historic areas, and historic properties that may be of religious and cultural significance; assessments of effect when a proposed project may affect a significant site; and during resolution of adverse effects to develop and evaluate alternatives or modifications to the undertaking to avoid, minimize, or mitigate adverse effects (ACHP 2005). 2. The advance notification process under NEPA. 3. In the event of an inadvertent discovery of human remains (see SOP #6, Inadvertent Discoveries of Human Remains).
Participants	HPO, Center Director, SHPO, and the federally-recognized Indian Tribes affiliated with Florida: 1. Miccosukee Tribe of Indians of Florida 2. Muscogee Creek Indians 3. Poarch Band of Creek Indians 4. Seminole Tribe of Florida 5. Seminole Nation of Oklahoma. The Miccosukee Tribe of Indians of Florida and the Seminole Tribe of Florida reside and have tribal lands in Florida. The other tribes have direct historical and cultural associations with Florida. The Poarch Band and the Seminole Tribe of Florida have a formally recognized THPO certified by the NPS. For tribes without a NPS certified THPO, consultation takes place with the designated representative of the tribe and the SHPO. An attempt should be made to identify any non federally-recognized Native American groups that may eventually be brought into the consultation process.

RELEASED - Printed documents may be obsolete; validate prior to use.

SOP #4: NATIVE AMERICAN CONSULTATION (cont.).	**Page 2**
Action Plan	The HPO shall: 1. Acknowledge the sovereignty of each tribe and respect the Government-to-Government relationship between each Tribe and NASA. 2. Respect each tribal culture and the respective tribal representatives. 3. Recognize tribal expertise in heritage site matters. 4. Guard heritage sites from public disclosure. 5. Avoid impacts to sites of significance to tribal governments and their members. 6. Where impacts are unavoidable, work with the tribal representatives to reach the most reasonable mitigation measures. 7. Consult in the form of a notification letter to each of the federally-recognized tribes or enter into a comprehensive agreement with the tribes, pursuant to 43 CFR Part 10.5(f), to limit the number of consultations. 8. The letter is prepared by the HPO and signed by the Center Director or designated official. The original letter should be sent via certified mail (with a return receipt requested) to the Chief or Chair of each of the tribes, with a copy to the THPO or tribal historic preservation representatives. Names and addresses are provided in **Exhibit 6-3**. The notification letter, under NEPA or Section 106, should include: a. A clear statement that the project is being conducted pursuant to applicable law(s) (e.g., Section 106 of the NHPA). b. A statement that the letter is intended to initiate project-specific consultation between NASA KSC and the federally-recognized tribe and is intended to identify any issues of importance to the tribe. c. A brief description of the project. d. A map showing the location of the project. e. A statement that a CRAS will be conducted and a copy of the report forwarded to the tribe, if requested. f. A request for comments from the tribe, including the deadline for response. g. The name(s) of the KSC contact person(s).

RELEASED - Printed documents may be obsolete; validate prior to use.

SOP #5: UNANTICIPATED DISCOVERIES OF ARCHAEOLOGICAL MATERIALS	**Page 1**
Goals and Objectives	To protect potentially significant archaeological sites that do **not** contain human remains, funerary objects, sacred objects, or objects of cultural patrimony covered under NAGPRA. Note: After a Phase I survey has been conducted, it is not always possible to discover deeply buried archaeological deposits. They may be exposed by construction or other ground disturbing activities.
Triggering Event	36 CFR Part 800.13. When land is disturbed from construction projects, maintenance activities, or remediation activities where artifacts and/or other cultural materials could be uncovered.
Participants	HPO, SHPO, and contractor.
Action Plan	1. The archaeological materials (including artifacts and/or cultural features) discovered during ground-disturbing activities will be reported immediately to the HPO. These materials are turned over to the HPO and are the property of NASA KSC (See SOP #10, Archaeological Collection Management). 2. All ground-disturbing activities in the immediate vicinity of the discovery (within an approximately 6 m (20 ft) radius) are stopped and the discovery area is protected from further disturbance until inspection by the HPO or designee. 3. Within one working day of notification the HPO or designee inspects the area to determine if the deposits are natural or cultural in origin. 4. If the findings are **not considered significant**, the HPO provides approval for the project to proceed. 5. If human remains are present, proceed to SOP #6, Inadvertent Discoveries of Human Remains. 6. If the inspection reveals archaeological materials other than human burials or remains (or other cultural items covered under NAGPRA), and if disturbance is minor, the HPO consults with the SHPO to determine appropriate actions. 7. If requested by the SHPO, the HPO or designee gathers data and takes photographs of the discovery site and prepares a report for the SHPO, which shall include: a. A description of the number and type of cultural materials exposed. b. The depth of these deposits. c. A determination of age and cultural affiliation, if possible. d. An evaluation of the extent of the damage. e. An assessment of site significance to the extent possible. 8. If the HPO and SHPO **agree** that the archaeological materials **are not significant**, the HPO provides approval for the project to proceed and prepares a summary memo for the file. 9. If the SHPO and HPO consider the cultural materials to be insufficient to make an assessment of significance, the HPO arranges for limited testing (**Phase II**) to be conducted by a professional archaeologist. A report of findings is prepared and provided to the SHPO. 10. If the results of testing indicate that the archaeological site **does not meet the NRHP criteria of eligibility**, and the SHPO concurs, the project may proceed. 11. If the results of testing indicate that the archaeological site **does meet the NRHP criteria of eligibility**, and the SHPO concurs, the HPO and SHPO consult to determine appropriate measures to avoid or mitigate adverse effects.

RELEASED - Printed documents may be obsolete; validate prior to use.

SOP #5: UNANTICIPATED DISCOVERIES OF ARCHAEOLOGICAL MATERIALS (cont.). Page 2	
Action Plan (cont.)	12. If the proposed action or project cannot be modified to avoid adverse effects to the archaeological resources and if the SHPO and HPO agree that the data recovery plan is limited in scope, a Phase III excavation proceeds without an MOA. Follow the plan of action referenced in SOP #9, Phase III Mitigation Excavation and Data Recovery. 13. If an MOA is developed for a Phase III mitigative excavation, follow the steps in SOP #9. 14. Within **10 working days** of completion of site excavation, the contractor provides a management summary to the HPO for review by the SHPO. 15. The undertaking or project may resume within **five days** of receipt of a notification of project approval from the SHPO. 16. Artifacts collected will be treated in accordance with SOP #10, Archaeological Collections Management.
What constitutes "artifacts or cultural features that may be significant?"	Generally, the **discovery of one or more artifacts,** such as whole or broken stone tools or pottery sherds is not considered significant. Ideally, these findings should be reported to the HPO, but work in progress does not need to be halted. On the other hand, the following types of cultural materials and features **should trigger work stoppage** and notification of the HPO: • Wooden dugout canoes. • Artifacts made of exotic stone or metal, which may indicate the presence of an aboriginal burial. • Ground surface concentrations of shells, including clam, oyster, whelk, and coquina, with or without artifacts and/or non-human animal bones. • Buried layers of darkened soil containing visible inclusions of shells, artifacts, and/or non-human animal bones. • Unusual and patterned stains in the soil, which may represent aboriginal hearths, refuse pits, or the remnants of structural features. • Rectangular stains in the soil containing the remains of wood planks and nails. These may represent historic burials. • Concentrations of bottles, ceramics, metal artifacts, etc., which may represent historic refuse deposits. • Arrangements of cut coquina blocks or bricks, which may indicate early historic residential or industrial features.
Example Scenarios	1. The undertaking was cleared for development, following a systematic Phase I archaeological survey in compliance with Section 106. Artifacts or cultural features that may be significant are discovered during construction or land altering activities. 2. The project was reviewed and did not require a Phase I professional archaeological survey. Artifacts or cultural features that may be significant are discovered during construction or land altering activities.

RELEASED - Printed documents may be obsolete; validate prior to use.

SOP #6: INADVERTENT DISCOVERIES OF HUMAN REMAINS	**Page 1**
Goals and Objectives	To protect human burials and human skeletal remains inadvertently discovered at KSC and to comply with all applicable federal and state laws and regulations regarding the required course of action.
Triggering Event	Human remains are uncovered during an in-progress project, during an undertaking that has previously been cleared for development, or as the result of natural actions such as erosion, storms, or animal activity (e.g., rooting hogs). Human burials and human skeletal remains on NASA-owned lands are protected by both federal (NAGPRA, Section 3(d) and Section 10.4 of 43 CFR Part 10) and state (Chapter 872, F.S.; Chapter 1A-44, Florida Administrative Code) law and regulations.
Participants	HPO, FWS-MINWR, State Archaeologist and/or District Medical Examiner (DME), Indian Tribes, SHPO, and other interested parties.
Action Plan/Step 1: Initial Compliance with state laws and regulations	1. If human remains are discovered, all project activity on or near the discovery site must stop immediately. 2. The HPO and MINWR law enforcement officer are notified. 3. The human remains are left in place. Protect them and any associated cultural items from further disturbance. Covering the human remains with soil may be an appropriate protective measure. 4. Within one working day, the HPO will assess the discovery with the law enforcement officer and will notify the DME or coroner. 5. The DME will determine whether the **remains are under the DME's jurisdiction** (i.e., the remains may be involved in a legal investigation or represent the burial of an individual who has been dead less than 75 years) or that of the State Archaeologist. 6. If the DME finds that **the remains are not under his/her jurisdiction**, he/she should notify the **State Archaeologist, (850) 245-6444,** who should designate an archaeologist and human skeletal analyst to examine the remains and report within **15 days** as to their cultural and biological characteristics. 7. If the human remains are **not Native American**, public notice should be given for the removal of any historic burials to allow for the identification of kin. 8. If marked gravestones are present, genealogical research should be conducted to identify living relatives. 9. In the event that the human remains are **identified as Native American**, the notification and consultation requirements specified in 43 CFR Part 10 should apply. See Step 2.
Action Plan/Step 2: Compliance with NAGPRA	1. The HPO must take immediate steps to further secure and protect the inadvertently discovered human remains, funerary objects, sacred objects, and objects of cultural patrimony, including as appropriate, stabilization or covering. 2. Within **three working days** after notification of the inadvertent discovery, the HPO must notify by telephone, with written confirmation, representatives of the six federally-recognized tribes (**Exhibit 6-3**), other groups believed to have cultural affiliation, and the SHPO. Written notification should be followed up by telephone contact if there is no response within **15 days**.

RELEASED - Printed documents may be obsolete; validate prior to use.

SOP #6: INADVERTENT DISCOVERIES OF HUMAN REMAINS (cont.).	**Page 2**
Action Plan/Step 2: Compliance with NAGPRA (cont.)	3. The written notification must include information as to the kinds of human remains, funerary objects, sacred objects, and objects of cultural patrimony; their condition; and the circumstances of their discovery. 4. The HPO follows the consultation requirements pursuant to Section 10.5 of 43 CFR Part 10. The notice to the tribal representations and SHPO must propose a time and place for meeting or consultation to consider the proposed treatment and disposition of human remains, funerary objects, sacred objects, and objects of cultural patrimony. 5. If the human remains, funerary objects, sacred objects, and objects of cultural patrimony must be excavated or removed, the HPO must complete a written plan of action which includes at a minimum the following pursuant to 43 CFR Part 10.5(e): a. The kinds of objects to be considered as cultural items. b. The specific information used to determine custody. c. The planned treatment, care, handling, and archeological recording of the human remains, funerary objects, sacred objects and objects of cultural patrimony recovered. d. The kinds of analysis planned for each kind of object. e. Any steps to be followed to contact Indian Tribe officials at the time of excavation or discovery. f. The kind of traditional treatment, if any, to be afforded to the human remains, funerary objects, sacred objects, and objects of cultural patrimony by members of the Indian Tribes. g. The nature of reports to be prepared. h. The planned disposition of human remains, funerary objects, sacred objects, and objects of cultural patrimony. 6. The actions described in the plan are executed. 7. The HPO ensures that disposition of all human remains, funerary objects, sacred objects, and objects of cultural patrimony are carried out pursuant to 43 CFR Part 10.6. 8. The activity that results in the inadvertent discovery may resume **30 days** after certification by the HPO.

RELEASED - Printed documents may be obsolete; validate prior to use.

SOP #7: PHASE I ARCHAEOLOGICAL SURVEY	**Page 1**
Goals and Objectives	To locate and identify all archaeological sites within the proposed project APE, to assess their significance in terms of NRHP eligibility, and to determine if the undertaking will affect historic properties.
Triggering Event	Section 106 of the NHPA; NEPA compliance; Secretary of the Interior's Standards and Guidelines for Archeology and Historic Preservation, and Chapter 1A-46, Florida Administrative Code (Archaeological Report Standards and Guidelines).
Participants	HPO, SHPO, and contractor. Consults with SHPO, Native American tribal representatives, and other interested parties, as appropriate.
Action Plan/Step 1: Identification and Evaluation	1. The HPO prepares a SOW, which contains a description of the proposed undertaking, the required tasks and deliverables, as well as a project schedule. 2. The HPO selects a contractor and kicks off the project. 3. The HPO or designee arranges for the contractor's security clearance. 4. The HPO provides the contractor with an aerial photograph showing the limits of the project APE. 5. At least **seven working days** prior to the start of field survey, the contractor completes a "Utility Locate/Excavation Permit Request" or "Dig Permit" (**Exhibit 6-4**) and faxes it to the **Excavation Permit Administrator at 867-1175**. At least **72** hours prior to the scheduled start of field survey, the contractor will schedule an appointment with the **Excavation Permit Inspectors** by calling **861-3375/6869 or cell 749-4840 or 289-2372.** At the conclusion of the field survey, the contractor will notify the **Excavation Permit Administrator** at **867-2406**. 6. The contractor conducts background research, archaeological field survey, and artifact analysis, and evaluates each previously recorded and newly discovered site within the project APE as per the NRHP criteria of eligibility. 7. The contractor prepares a draft CRAS report, in accordance with the specifications below, and submits **two** copies to the HPO for review. 8. The HPO reviews the draft CRAS report and provides comments to the contractor. 9. Upon receipt of the HPO's comments, the contractor makes the requested changes and, within **five working days**, prepares and submits five copies of the final report and one copy on CD along with a set of original FMSF forms and a Survey Log Sheet to the HPO. 10. The contractor provides the HPO with all artifacts and associated records (e.g., field notes, maps, artifact analysis and inventory sheets, photographs, and other associated records) within **60 days** of KSC's acceptance of the final report.
Action Plan/Step 2: Determine Effects	In accordance with Section 106, based upon the results of the Phase I archaeological survey, the HPO will make a determination of effect, as follows: Determine "**No Historic Properties Affected**" if either: • No previously recorded or newly discovered archaeological sites were identified within the project APE. • Archaeological sites were identified with the project APE and are assessed as ineligible for listing in the NRHP. Determine "**Historic Properties Affected**" if archaeological sites were identified within the project APE, and one or more meets the criteria of eligibility for listing in the NRHP.

RELEASED - Printed documents may be obsolete; validate prior to use.

SOP #7: PHASE I ARCHAEOLOGICAL SURVEY (cont.).	**Page 2**
Action Plan/Step 3: HPO Coordination with SHPO	1. The HPO submits one copy of the final report, the set of original FMSF forms, and the Survey Log Sheet to the SHPO for review and concurrence (allow **30 days**). The **cover letter** shall provide the following information: a. Description of the undertaking. b. Applicable laws and regulations for conducting the CRAS. c. Summary of survey results. d. Summary of effects (**No Historic Properties Affected**; **Historic Properties Affected**). 2. Review by the Compliance Review Section staff of the office of the SHPO makes use of the Sufficiency Checklist (**Exhibit 6-5**). The SHPO will provide written notification when documents are incomplete and/or insufficient and will give specific directions so that additional information can be provided. 3. If the SHPO concurs with the findings, the concurrence letter is filed in the EMB with the report and the HPO distributes copies of the final report, as appropriate. 4. If the SHPO requests additional information, the HPO requests the contractor to provide the data. 5. The revised CRAS report and corrected supporting documentation, if applicable, is provided by the HPO to the SHPO. 6. The HPO files one copy of the final report in the EMB and enters it in the NETS CRM module.
General Requirements for Contractors	All archaeological work must be consistent with the Secretary of the Interior's Standards and Guidelines for Archeology and Historic Preservation, as well as Chapter 1A-46, Florida Administrative Code (Archaeological Report Standards and Guidelines). Standard field survey methods must include a combination of surface reconnaissance and systematic subsurface testing. **Shovel testing and screening are mandatory**. The intensity of subsurface testing shall be guided by the likelihood for site occurrence, as described in the research design. **Human remains shall not be collected.** If any human remains are found during the archaeological survey, work must cease and the HPO notified, in accordance with SOP #6. **Human remains are not to be disturbed in any way.** For **non-official copies** of the report, such as those distributed to interested parties or public repositories, **figures depicting the locations of archaeological sites shall not be included.** Federal law (**ARPA Section 9a and NHPA Section 304**) protects information on the nature and location of archaeological resources, including disclosure of such information through the Freedom of Information Act request.

RELEASED - Printed documents may be obsolete; validate prior to use.

SOP #8: PHASE II TEST EXCAVATION	**Page 1**
Goals and Objectives	To provide archaeological data sufficient to allow for both a determination of site significance in terms of NRHP eligibility criteria and recommendations for future treatment of the site. The specific goals are to define site boundaries, internal stratigraphy, temporal/cultural affiliations, function, intrasite structure, and integrity to the extent possible. The testing strategy should focus primarily on that portion of the resource to be directly affected by the proposed undertaking.
Triggering Event	Insufficient data for evaluation of site significance resulted from a Phase I survey conducted in accordance with Section 106 of the NHPA or as the result of an inadvertent discovery.
Participants	HPO, SHPO, contractor, and Native American tribal representatives, and other interested parties, as appropriate.
Action Plan/Step 1: Site Testing and Evaluation	1. The HPO consults with the SHPO, Native American tribal representatives, and other interested parties, as appropriate. 2. The HPO prepares a SOW, which contains a description of the proposed undertaking, the required tasks and deliverables, as well as a project schedule. 3. The HPO selects a contractor and kicks off the project. 4. The HPO or designee arranges for the contractor's security clearance. 5. The HPO provides the contractor with an aerial photograph showing the limits of the project APE. 6. The contractor prepares a **Research Design,** which will guide the excavation and analysis phases of work. Relevant research questions must be included in the research design (See Research Domains in Chapter 2, Section 2.5.2,). 7. The Research Design is submitted to the SHPO via the HPO for review and approval prior to the beginning of fieldwork. 8. The contractor completes the Excavation Permit Request (**Exhibit 6-4**) process prior to starting the fieldwork (See SOP #7 for details). 9. The contractor conducts archaeological test excavation and artifact analysis and prepares an initial Management Summary, followed by a draft Phase II Test Excavation Report. The report includes a full justification for why the site does or does not meet the NRHP eligibility criteria. 10. The contractor submits **two copies** of the draft report to the HPO for review. 11. The HPO reviews the draft CRAS report and provides comments to the contractor. 12. The contractor makes the requested changes and within **five working days** prepares and submits **10 copies** of the final report and one copy on CD along with a Survey Log Sheet with attached map depicting project boundaries and an updated FMSF. 13. The contractor provides the HPO with all artifacts and associated records (e.g., field notes, maps, artifact analysis and inventory sheets, photographs, and other associated records) within **60 days** of KSC's acceptance of the final report.

RELEASED - Printed documents may be obsolete; validate prior to use.

SOP #8: PHASE II TEST EXCAVATION (cont.).	**Page 2**
Action Plan/Step 2: HPO Coordination with SHPO	1. The HPO submits one copy of the final report, the updated FMSF form, and a Survey Log Sheet to the SHPO for review and concurrence. The cover letter shall provide the following information: a. Description of the undertaking. b. Applicable laws and regulations for conducting the CRAS. c. Findings and summary of survey results. d. Evaluation of site significance. e. Recommendations for further actions. 2. The SHPO reviews the findings and consults with the HPO regarding future actions, if needed. 3. If the results of Phase II test excavation indicate that the site is **not eligible for listing in the NRHP** and the SHPO concurs, the action or project may move forward without further review. 4. If the results of Phase II testing indicate that the site is **potentially eligible for listing in the NRHP**, the HPO, in consultation with the SHPO and the ACHP, shall prepare an MOA or agreement document stipulating the actions necessary to mitigate the adverse effects of the proposed development, then proceed to SOP #9, Phase III Mitigation Excavation and Data Recovery. 5. The HPO files all correspondence in the EMB with the report and distributes copies of the final report, as appropriate. The report is also entered into the NETS CRM module.
General Requirements for Contractors	**Field methods** shall include initial controlled surface collection and systematic shovel testing followed by the excavation of a limited number of units measuring no smaller than 1 m x 1 m (3.3 ft x 3.3 ft). **Human remains shall not be collected.** If any human remains are found during the excavation, work must cease and the HPO notified, in accordance with SOP #6, Inadvertent Discoveries of Human Remains. Human remains are not to be disturbed in any way. **Analysis** shall be oriented toward the evaluation of the site's ability to answer important research questions as described in the Research Design. Following completion of the Phase II test excavation, the contactor shall prepare a **Management Summary** presenting the project methods, preliminary findings and recommendations. This document should be sufficient for SHPO review and comment.

RELEASED - Printed documents may be obsolete; validate prior to use.

SOP #9: PHASE III MITIGATIVE EXCAVATION AND DATA RECOVERY	**Page 1**
Goals and Objectives	To provide archaeological data when a site is threatened with unavoidable physical destruction or damage, when preservation in place is not feasible, and when the primary significance of the resource is embodied in the information it contains. The Phase III archaeological excavation will be conducted in accordance with the stipulations of an MOA or agreement document. The objective of the archaeological excavation and data recovery is to mitigate the adverse effects of the proposed undertaking.
Triggering Event	Section 106 resolution of adverse effects.
Participants	HPO, SHPO, contractor, and Native American tribal representatives, and other interested parties, as appropriate.
Action Plan/Step 1: Excavation	1. The HPO consults with SHPO, Native American tribal representatives, and other interested parties, as appropriate. 2. The HPO prepares a SOW, which contains a description of the required tasks and deliverables, as well as a project schedule. 3. The HPO selects a contractor and kicks off the project. 4. The HPO or designee arranges for the contractor's security clearance. 5. The contractor prepares a Data Recovery Plan and submits **2 copies** to the HPO. The HPO concurs with the plan and forwards for SHPO review and approval prior to the initiation of fieldwork. Allow **30 days** for SHPO review. If no response is received after **30 days** proceed with the project. 6. The contractor completes the "Excavation Permit Request" (**Exhibit 6-4**) process prior to starting fieldwork (see SOP #7 for details). 7. The contractor conducts archaeological excavation and artifact analysis and prepares an initial Management Summary, followed by a draft Phase III Mitigative Excavation Report. 8. The contractor submits **two copies** of the draft report to the HPO for review. 9. The HPO reviews the draft CRAS report and provides comments to the contractor. 10. Upon receipt of the HPO's comments, the contractor makes the requested changes and within **10 working days**, prepares and submits **5 copies** of the final report and one copy on CD along with an updated FMSF form. 11. The contractor provides the HPO with all artifacts and associated records (e.g., field notes, maps, artifact analysis and inventory sheets, and photographs) within **60 days** of KSC's acceptance of the final report.
Action Plan/Step 2: HPO Coordination with SHPO	1. The HPO submits one copy of the final report, a CD, and the updated FMSF form to the SHPO for review and concurrence. The cover letter shall provide the following information: a. Description of the project and the agreement document guiding the work. b. Applicable laws and regulations for conducting the excavation. c. Summary of excavation results. 2. The SHPO reviews the findings and acknowledges that all the terms of the MOA or agreement document have been carried out. 3. The action or project proceeds. 4. The HPO files the SHPO correspondence in the EMB office with the report and distributes copies of the final report, as appropriate. The report is entered into the NETS CRM module.

RELEASED - Printed documents may be obsolete; validate prior to use.

SOP #9: PHASE III MITIGATIVE EXCAVATION AND DATA RECOVERY (cont.).	**Page 2**
General Requirements for Contractors	Prior to fieldwork, the consultant shall develop a **Data Recovery Plan** consistent with the Secretary of the Interior's Standards for the Treatment of Historic Properties, the Secretary of the Interior's Standards and Guidelines for Archeology and Historic Preservation, and the guidance provided in the ACHP's "Recommended Approach for Consultation on Recovery of Significant Information from Archaeological Sites" (2002). The content also shall reflect the guidelines set forth in 36 CFR Part 66 (Recovery of Scientific, Prehistoric, Historic, and Archaeological Data: Methods, Standards, and Reporting Requirements), and take into account the DHR's Historic Preservation Compliance Review Program Guidelines (revised November 1990). In accordance with the ACHP's guidance (2002), the **Data Recovery Plan** shall specify at a minimum: • The results of previous research relevant to the project. • Research problems or questions to be addressed with an explanation of their relevance and importance. • The field and laboratory analysis methods to be used with a justification of their cost-effectiveness and how they apply to this particular property and these research needs. • The methods to be used in artifact, data, and other records management. • Explicit provisions for disseminating the research findings to professional peers in a timely manner. • Arrangements for presenting what has been found and learned to the public, focusing particularly on the community or communities that may have interests in the results. • The curation of recovered materials and records resulting from the data recovery in accordance with 36 CFR Part 79 (except in the case of unexpected discoveries that may need to be considered for repatriation pursuant to NAGPRA). • Procedures for evaluating and treating discoveries of unexpected remains or newly identified historic properties during the course of the project, including necessary consultation with other parties. **Archaeological Excavation** shall clearly define site boundaries, internal site structure, and the cultural affiliation of the component(s) present. Standard methods shall include site mapping, systematic shovel testing (only if Phase II test excavation was **not** conducted), unit and/or block excavation, and mechanical excavation and monitoring (if appropriate). **Human remains shall not be collected.** If any human remains are found during the excavation, work must cease and the HPO notified, in accordance with SOP #6, Inadvertent Discoveries of Human Remains. Human remains are not to be disturbed in any way. Following completion of the Phase III excavation, the contactor shall prepare a Management Summary presenting the project methods, preliminary findings and recommendations. This document should be sufficient for SHPO review and comment.

RELEASED - Printed documents may be obsolete; validate prior to use.

SOP #10: ARCHAEOLOGICAL COLLECTIONS MANAGEMENT	
Goals and Objectives	To comply with the curation requirements pursuant to **36 CFR Part 79** and to ensure that archaeological collections from sites at KSC are preserved and made available for research. Since 2001, all archaeological collections from KSC sites located in FWS/CNS land management areas have been curated at the SEAC facility in Tallahassee, Florida. SEAC is responsible for the cleaning, cataloging, and archival processing of these materials.
Triggering Event	Collection of artifacts and other cultural materials from archaeological sites at KSC (reference Chapter 5, Section 5.6. Curation).
Participants	HPO, NPS/CNS, SEAC, FWS, and contractor.
Action Plan	1. The HPO will prepare a SOW including stipulations requiring the transfer of artifacts and other cultural materials as well as associated records. 2. The contractor will ensure the integrity of new collections made from archaeological sites by performing the following procedures: a. Store all artifacts in secondary containers consisting of 4-mil resealable polypropylene bags with acid-free paper labels inside the bags and an indelible ink label indicating provenience on the outside of the bag. b. Label on the outside of each primary container (cardboard box) with the project name and date. c. Inventory each box and provide a list printed on acid-free paper placed inside the box. d. Prepare an Excel spreadsheet or Word table to contain a master inventory for all box contents printed on acid-free paper and included with the submission of artifacts and records to the HPO. e. Prepare a duplicate (or original) set of all work products, including, but not limited to, field notes, survey and excavation forms, field maps and sketches, interview notes, photographs, and artifact analysis and inventory sheets, f. Submit a final report of the project with the artifact collections no later than **30 days** after the final approval and acceptance of the draft (or revised) report to the HPO. g. Provide, if applicable, digital photographs on CD accompanied by a photographic log. h. Hand deliver all artifacts and associated records to the HPO. If this is not feasible, send to the HPO by certified mail. 3. The HPO will validate that the collection and associated records are prepared for proper transfer. 4. Loan agreements will be reviewed by the HPO prior to date of expiration.

RELEASED - Printed documents may be obsolete; validate prior to use.

SOP #11: IDENTIFICATION AND EVALUATION OF HISTORIC PROPERTIES	**Page 1**
Goals and Objectives	To complete a "gate-to-gate" historical/architectural survey of NASA-owned real property and/or personal property (which is typically large and/or mobile) at KSC and CCAFS; to re-evaluate existing historic properties, as needed; and to make amendments to existing NRHP and NHL[1] nominations. The standardized methods (criteria/property types outlined in **Exhibit 3-4**) used in the previous historic facilities surveys (Apollo and SSP assets) shall be used in all historical/architectural surveys.
Triggering Event	Section 110 or Section 106 of the NHPA.
Participants	Real Property Officer (RPO), Facility Managers, HPO, SHPO, ACHP, NPS, NASA FPO, 45th Space Wing Cultural Resource Manager, KSC and CCAFS Historian/Archivists, and interested parties.
Action Plan	1. The HPO examines the Real Property Inventory to determine the number of facilities that have reached 45-**50** years of age, or to determine which potentially significant facilities may be affected by the closure of a specific program (i.e., Apollo, Space Shuttle). 2. The HPO may conduct an in-house survey of those facilities and structures that might not meet the Criteria of Eligibility (36 CFR Part 60.4) and prepare a package for the SHPO's concurrence. The package must contain the following: a. Map showing location of properties b. Facility name/number and description of facility and its function c. Program supported, and day-to-day Center operations conducted at the facility d. Is the facility contributing to a historic district? 3. The HPO prepares a SOW that contains a description of tasks and deliverables, as well as a project schedule. 4. The HPO selects a contractor and kicks off the project. 5. The HPO or designee arranges for the contractor's security clearance, assists with the collection of research materials, and addresses all logistical issues, including access to facilities. 6. The contractor conducts onsite archival research, including examination of historic photographs, site/floor plans and drawings, real property records, technical facility catalogs, and master plans. 7. The contractor performs interviews with selected informants, such as Facility Managers. 8. The contractor conducts facility survey, including inspection of each facility's exterior, interior, and specialized features, and photographs representative views. 9. The contractor evaluates each facility as per the NRHP criteria of eligibility. 10. The contractor prepares a draft report, which includes the relevant historic context, survey methods, facility descriptions and evaluations, and FMSF and NRHP nomination forms, as applicable, and submits it to the HPO for review and comments. 11. The HPO reviews the draft survey report and provides comments to the contractor.

RELEASED - Printed documents may be obsolete; validate prior to use.

SOP #11: IDENTIFICATION AND EVALUATION OF HISTORIC PROPERTIES (cont.).	**Page 2**
Action Plan (cont.)	12. The contractor finalizes the survey report and submits the required number of copies pursuant to the SOW to the HPO. Deliverables will include a set of original FMSF and NRHP nomination forms as well as a Survey Log Sheet. 13. The HPO prepares a briefing note for Center management concurrence. 14. If Center management **concurs** with the findings, the HPO forwards the survey to the SHPO for concurrence. 15. The HPO submits the nomination forms to the FPO. If the FPO **concurs** with the eligibility determination(s), the NRHP nomination form(s) are signed and forwarded to the SHPO. The FPO notifies the HPO of this action by email or phone. If the FPO does not concur, then the FPO, HPO and the contractor resolve all issues. 16. If the SHPO concurs with the eligibility determination(s), a letter is forwarded to the FPO and HPO. If the SHPO does not concur, the FPO, HPO and the contractor resolve all issues. 17. After signing the nomination form(s), the SHPO forwards the documentation package to the Keeper at the NPS in Washington, D.C. for evaluation. If accepted the property will be listed in the NRHP. The SHPO informs the HPO of this action by letter or email. Correspondence and documentation is filed, and entered into the NETS CRM module.

[1] The **NRHP** and **NHL designation** of a historic property may be considered for **withdrawal** in cases where the property has lost its ability to convey its national significance (i.e., loss of integrity) through alteration, addition, or demolition. Withdrawal of NHL designation is done either at the request of KSC, in coordination with the NPS regional office, or on the initiative of the Secretary of the Interior.

RELEASED - Printed documents may be obsolete; validate prior to use.

SOP #12: HABS/HAER DOCUMENTATION	**Page 1**
Goals and Objectives	To mitigate the adverse effects of an undertaking involving demolition or major alteration of a NRHP-listed or eligible archaeological site or historic property through the performance of documentation in accordance with HABS/HAER standards (ref **Exhibit 6-6** and Section 5.8.4 Mitigation Measures). For archaeological resources, the level of required documentation is agreed upon and contained in the MOA or agreement document developed by the HPO in consultation with the SHPO and the ACHP. For historic facilities, recordation is in accordance with the stipulations of the PA.
Triggering Event	Section 106 resolution of adverse effects; Section 110(b) records requirements.
Participants	HPO, NPS, SHPO, and the contractor.
Action Plan	1. The HPO prepares a SOW and Support Request, which specifies the level of documentation that has been agreed upon by all parties, the estimated number of views, the required number of both archival and non-archival sets of the completed documentation package, and a schedule for completion of services. Typically, **two** archival and **two** non-archival sets are requested for the undertaking. 2. The HPO contracts for professional services pursuant to the Secretary of the Interior's Standards, as well as experience with comparable projects. 3. The HPO arranges for both security clearance for members of the consultant team and access to the facility to be documented. 4. The HPO also facilitates procurement of architectural/engineering drawings and other archival materials for use by the consultant. The repository for the as-built drawings of facilities, prepared by the U.S. Army Corps of Engineers, is the **Engineering Documentation Center (EDC)**. These drawings are indexed by building number and building code drawing number. An automated database at the EDC contains all the drawings. The drawing number for all pre- 1980 as-built drawings begins with "203-." After 1979, the number is "K79-." Examples of significant facilities with their building (in parentheses) and drawing numbers, are as follows: LCC (K6-900), Drawing No. 203-100; LC-39 Pad A (J8-1708), Drawing No. 203-101. 5. The contractor conducts onsite research and photographic documentation and prepares the documentation package, including the written narrative. 6. The contractor submits a draft package to KSC and to the **NPS Southeast Regional Office** at the **Atlanta Federal Center, 1924 Building, 100 Alabama St., SW., Atlanta, Georgia 30303** for review with a copy of the letter of transmittal provided to the HPO. 7. The NPS has a minimum of **30 days** to review the package. The package should include: a. A copy of the signed MOA or agreement document. b. Written narrative printed on standard photocopy paper. c. Set of archival photographs labeled in numeric order (mount cards are not necessary for this submission). d. Blank negative and archival print. 8. Once the NPS has reviewed the draft, they will assign the official HABS/HAER number for the project and send the package back to the consultant with a list of comments that need to be addressed. 9. The contractor revises the documentation as necessary, and labels the photographs, mount cards, negatives, and negative sleeves using the NPS-assigned number.

RELEASED - Printed documents may be obsolete; validate prior to use.

SOP #12: HABS/HAER DOCUMENTATION (cont.).	**Page 2**
Action Plan (cont.)	10. The final package for the NPS and additional number of archival and non-archival set, as specified in the contract, are provided to the HPO. The archival set(s) must include the following: a. A copy of the signed MOA, which clearly states the approved level of documentation. b. Cover Sheet (printed on archival stock paper). c. Index to photographs (printed on archival bond paper). d. A written narrative including the relevant Historic Context and Physical Description of the resource (printed on archival bond paper). The text should not include any photographs. Historic views, maps, and other images may be attached as an appendix. e. Bibliography (printed on archival bond paper). f. Archival prints of all large-scale photographs taken of the historic resource. The size of the prints should always match the size of the negatives (for example, if 4" x 5" negatives are used, the prints should be 4" x 5"). Each photo must be mounted on archival stock paper and labeled in the upper right corner. g. Architectural drawings are included as an appendix. Full-size scans in pdf format of each drawing in the appendix are included in the field notes on the CD provided to the NPS. One set of large-scale negatives is included. Each negative should be labeled in the clear margin on the base side of the negative using a carbon- or acetate-based ink. Each negative should be placed in an archival sleeve labeled with the corresponding photograph number in the upper right corner. h. One blank negative and archival print for testing purposes. i. One photocopy of the documentation package (excluding the negatives) on standard photocopy paper for the records of the NPS Regional Office. j. Signed copyright release (**Exhibit 6-7**). k. CD of the written history. 11. The HPO checks the documentation package for completeness prior to submittal to the NPS and SHPO. 12. The HPO sends the following: a. One archival set is sent to the NPS Southeast Regional Office. The NPS will forward to the Library of Congress for incorporation into the National Historic Architectural and Engineering Records or "with such other appropriate agency as may be designated by the Secretary, for future use and reference," as per Section 101(b) of the NHPA. b. One archival copy is sent to the SHPO. c. One non-archival copy is provided to the KSC Archives Office. d. One non-archival copy is kept in the EMB CRM files. e. The final package is uploaded onto the CRM website. 13. The SHPO and NPS forward acceptance letters to the HPO after review and concurrence of the documentation.

RELEASED - Printed documents may be obsolete; validate prior to use.

SOP #13: ADMINISTRATIVE TASKS FOR COMPLETING DATA CALLS AND UPLOADING CORRESPONDENCE AND DOCUMENTATION INTO THE CRM NETS MODULE	**Page 1**
PRESERVE AMERICA (TRIENNAL DATA CALL)	
Goals and Objectives	Federal agencies are encouraged to support community efforts for the preservation and enjoyment of their priceless natural and cultural heritage. It covers areas such as policy development and implementation, program goals, use of partnerships, challenges, successes, and opportunities.
Triggering Event	Section 3 of Executive Order 13287, Section 110 of the NHPA, NPR 8510.1, and NASA's Financial Annual Statement
Participants	HPO, FPO, ACHP, and KSC Organizations (Real Property Officer and Public Affairs)
Action Plan	The triennial Section 3 report data call comes from the FPO, who establishes timelines for the Centers to complete. The Center's data is uploaded into the CRM NETS Module. The FPO compiles the data and forwards a final report to the ACHP. **HPO -** Coordinates data call with KSC organizations (e.g., Public Affairs and Real Property Officer), evaluates data received or reports pulled from NETS, and completes the questionnaire for KSC. The HPO must answer a number of questions, such as summarizing changes to policies and guidelines regarding the protection of cultural resources; summarizing changes to actual project activities during the fiscal years; reporting fiscal year data on buildings or structures occupied or utilized by NASA and outside parties; historic buildings or structures demolished/deconstructed; summarizing agreements or partnerships; summary of historic resource utilization; and what specific CRM training requirements were completed. **RPO** – Provides a list of agreements, leases or partnerships that occupy historic properties. The RPO may also validate the number of historic buildings/structures that are occupied or utilized by NASA and outside parties. **Public Affairs** – Provides a list of heritage tourism activities during the past year(s). Heritage tourism refers to public outreach activities and promotional events designed to interest the public in NASA's cultural resources and history. The type of information required is the Event Title, Event Type, Event Description, Event Date, and the Number of Visitors/tourists attended.

RELEASED - Printed documents may be obsolete; validate prior to use.

SOP #13: ADMINISTRATIVE TASKS FOR COMPLETING DATA CALLS AND UPLOADING CORRESPONDENCE AND DOCUMENTATION INTO THE CRM NETS MODULE (cont.)	**Page 2**
ARPA (ARCHAEOLOGY) ANNUAL REPORTING SURVEY IN NETS	
Goals and Objectives	The goal of ARPA is to secure, for the present and future benefit of the American people, the protection of archaeological resources and sites, which are on public lands and Indian lands, and to foster increased cooperation and exchange of information between governmental authorities, the professional archaeological community, and private individuals. The data collection provides information about the ways that federal agencies meet the challenges of archaeological resources stewardship.
Triggering Event	Archaeological Resources Protection Act of 1979 NPR 8510.1, and NASA's Financial Annual Statement
Participants	HPO, FPO, NPS SEAC, FWS, CNS, and Secretary of Interior (Chief Archaeologist)
Action Plan	The yearly data call comes from NASA HQS FPO, who establishes timelines for the Centers to complete. The Center's data is uploaded into the CRM NETS module. The FPO compiles the data and forwards a final report to the Secretary of Interior (Chief Archaeologist). **HPO** - Coordinates datacall with internal land managers (FWS/CNS) and NPS SEAC (Richard Vernon). The HPO must complete the questionnaire for KSC. Some of the questions posed are regarding legislation, policies, public participation, education, outreach, archaeological planning, identification, and evaluation during the reporting year. In addition, data recovery projects, National Register activities, management of collections, resource management program funding, permits for investigations, and law enforcement activities. **NPS SEAC** (Richard Vernon, Richard_Vernon@nps.gov, 850-580-3011 x145) –Tracks and reports the number of visits made to KSC's collections by the public and interested parties within the fiscal year.
UPLOADING CORRESPONDENCE, REPORTS, AND NRHP-ELIGIBILITY DATA INTO NETS	
Goals and Objectives	The CRM module tracks cultural resources data and also connects to NASA's Cultural Resources Geographic Information System (CRGIS), which displays cultural resources information on NASA's public Web site and internally.
Triggering Event	NPR 8510.1, NASA Cultural Resources Management
Participants	HPO and CRM Specialist
Action Plan	**HPO** - Determines when official CRM records (surveys, regulatory correspondence, NRHP-eligibility determinations, MOAs/PAs, HABS/HAER, etc.) are uploaded into NETS prior to submission to NARA or other disposition in accordance with NPR 1441.1, NASA Records Retention Schedule. Maintains up-to-date records and reports for compliance with NHPA and the ARPA. Enters historic status code of each property, which is fed into the Real Property Database.

RELEASED - Printed documents may be obsolete; validate prior to use.

EXHIBIT 6-1
KSC ENVIRONMENTAL CHECKLIST

RELEASED - Printed documents may be obsolete; validate prior to use.

KSC ENVIRONMENTAL CHECKLIST

1. PROJECT TITLE:	PROJECT NO.:
3. PROJECT LOCATION: ☐ KSC ☐ CCAFS ☐ PAFB ☐ OTHER: _____	4. FACILITY NAME/NO.:
5. REQUESTOR/PROJECT LEAD: _____ ORG/MAIL CODE: _____	6. PHONE NO.:
7. PREPARER OF CHECKLIST: _____ ORG/MAIL CODE: _____	8. PHONE NO.:

9. PROJECT DESCRIPTION: (Provide site plans, maps, etc. as separate attachment(s))

10. a-r. Check the appropriate box (Yes, No, Undetermined) to identify if any component of the proposed project (including, but not limited to construction, installation, demolition, removal, activation or operation) will involve any of the items listed. Use the attached instructions. Provide more specific information for each item marked Yes or Undetermined in the third column.

☐ YES ☐ NO ☐ UNDETERMINED	a. Construction/Modification/Demolition: Constructing, altering, expanding, modifying (other than routine maintenance) or demolishing any building, pavement or structure.	
☐ YES ☐ NO ☐ UNDETERMINED	b. Land Impacts: Land disturbance, soil addition or removal, digging, grading, trenching, alteration or removal of vegetation, equipment/material staging area required, stockpiling and any activity in or near surface water (including ditches and low-lying areas).	
☐ YES ☐ NO ☐ UNDETERMINED	c. Hazardous Material and Hazardous, Controlled, or Universal Waste: Use, storage, generation and/or disposal of any hazardous or toxic material, petroleum products or paint coatings.	
☐ YES ☐ NO ☐ UNDETERMINED	d. Asbestos Containing Material (ACM): Disturbance of construction material that may contain asbestos (i.e., roofs, walls, ceilings, floor tile, piping insulation, caulk, etc.).	
☐ YES ☐ NO ☐ UNDETERMINED	e. PCBs: Disturbance or replacement of electrical distribution systems, communication systems, lightning protection, transformers, non-liquid PCB materials or any other items believed to contain PCBs, including paint coatings.	
☐ YES ☐ NO ☐ UNDETERMINED	f. Painting: Initial application or repainting of a facility (interior or exterior), structure or utility.	
☐ YES ☐ NO ☐ UNDETERMINED	g. Paint, Sealant, Caulking Removal: Includes surface preparation such as sandblasting, scraping, water blasting or chemical strippng of existing paint coatings. Specify method.	
☐ YES ☐ NO ☐ UNDETERMINED	h. Dewatering: Use of conventional wellpoints, hydraulic pumps, or other means to transfer groundwater (including water in utility manholes) for project activities including utility trenching, foundation work, roadbed construction, stormwater treatment pond, and borrow excavation.	
☐ YES ☐ NO ☐ UNDETERMINED	i. Stormwater: Construction of new building, pavement, impervious or semi-impervious surface and/or modification of an existing stormwater system. Give approximate number of square feet of impervious surface being added.	sq. ft.
☐ YES ☐ NO ☐ UNDETERMINED	j. Drinking/FIREX Water: Installation or modification of potable water system. Include diameter of new water piping if known.	inches
☐ YES ☐ NO ☐ UNDETERMINED	k. Domestic/Industrial Wastewater: Installation or modification of domestic sewer system, including septic tank systems, generation of process wastewater or modification to a system that handles or transports wastewater, including condensate lines, washdowns, outfalls, holding ponds and non-point source discharges associated with industrial applications/processes.	.
☐ YES ☐ NO ☐ UNDETERMINED	l. Air Emissions: Installation or alteration of a stack, scrubber, exhaust fan, vent, generator, fume hood, cooling tower, boiler, halon fire suppression system, HVAC system, refrigeration system; or discharge from painting or sandblasting. Describe emission source.	
☐ YES ☐ NO ☐ UNDETERMINED	m. Open Burning: Burning of any land clearing debris.	
☐ YES ☐ NO ☐ UNDETERMINED	n. Tanks: Construction, modification, or repair of above or underground storage tanks (including piping and/or containment). Type commodity stored and capacity here.	gallons

RELEASED - Printed documents may be obsolete; validate prior to use.

☐ YES ☐ NO ☐ UNDETERMINED	o. Transformers/Generators: Installation, replacement or repair of transformers, generators, or any other oil-filled equipment. Give capacity.	gallons
☐ YES ☐ NO ☐ UNDETERMINED	p. Exterior Lighting: Installation, refurbishment or modification of exterior lighting.	
☐ YES ☐ NO ☐ UNDETERMINED	q. Radiation: Generation of ionizing or non-ionizing radiation or use of any radiation source.	
☐ YES ☐ NO ☐ UNDETERMINED	r. Other: Please describe any other aspect of the proposed action that could potentially affect the environment. Use separate sheet if necessary.	

RELEASED - Printed documents may be obsolete; validate prior to use.

ENVIRONMENTAL CHECKLIST PREPARATION INSTRUCTIONS

1. **Project Title**: Title of proposed action as it appears on the work order or programming document.

2. **Project Number**: Insert SON, WON, PCN, DBEH, SXHT, MAXIMO or other authorized work identification number, as appropriate.

3. **Project Location**: Check box for applicable installation where work will be conducted. For off-site work, identify location.

4. **Facility Name/Number**: Use the proper name for the facility where work is being conducted and the assigned facility number. If proposed action is not directly associated with a facility, use the closest facility for reference.

5. **Requestor/Project Lead**: List name of individual who has requested the proposed action. If this individual cannot be identified, or no single individual is responsible for submitting the work requirement, then list the person who is most familiar with the proposed action, such as the design engineer or project lead, and their mail code.

6. **Phone Number**: Telephone number of individual identified in #5

7. **Preparer of Checklist**: List name of individual who completed the checklist and their mail code.

8. **Phone Number**: Telephone number of individual identified in #7.

9. **Project Description:** Provide a brief, complete description of the proposed project. Include size of project and site, proposed uses, and any known plans for the future. Attach additional information including site plans, maps, statement of work, etc.

10 a.-r. The items listed in this section could be included in, or result from, the work that is being proposed. To the best of your knowledge, indicate by checking the applicable box if any of these items could be affected by the proposed work. Check the "UNDETERMINED" box if you are not certain. If further information is required to complete items 10 a. - r., please reference the additional instruction sheet.

RELEASED - Printed documents may be obsolete; validate prior to use.

ENVIRONMENTAL CHECKLIST ADDITIONAL INFORMATION AND INSTRUCTIONS
SECTION 10a. -r.

The following additional information/instructions should be applied to Environmental Checklist Section 10a – r.

a. **Construction:** Some proposed construction activities may not have their scope defined well enough to allow easy identification of potential environmental concerns, and certain facilities and certain types of construction activities have restrictions or constraints that may not be easily identifiable. An example may be disposal of wastes from a construction or demolition project as opposed to waste generated from normal operations and maintenance (O&M) type projects. Types of waste accepted at the KSC Class III Schwartz Road Landfill are listed on the EPB web page at http://environmental.ksc.nasa.gov/permitting/wastePermit.htm. The proposed project must reflect the proper disposal method in the design specifications to ensure compliance with existing permits.

b. **Land Impacts:** Areas of major environmental concern associated with this item include the loss of vegetation and disturbance of land that may provide habitat for various types of wildlife. Disturbance of the ground could impact burrowing animals, such as the gopher tortoise. Other issues include the disposal of vegetation from land clearing, underground utilities, archaeological sites, wetlands, etc. If your project includes any type of vegetation removal, land clearing, tree trimming (other than routine landscape maintenance), digging, grading or activity in or near wetlands/surface waters, check yes for this item.

c. **Hazardous Material and Hazardous, Controlled, or Universal Waste:** A number of items have the potential to adversely affect the natural environment. Consequently, use of these items in the construction and/or operation of the proposed project will require special storage, handling and disposal. Hazardous materials usually constitute items that possess any one or more of the following characteristics: corrosive, flammable, toxic and/or reactive. If you are not sure, contact the EPB to determine if hazardous materials may be used in your project. In addition, should hazardous materials be included in your proposed project, the environmental office may be able to identify an acceptable non-hazardous alternative through the Pollution Prevention (P2) program. Wastes generated from use of hazardous materials will generally be classified as hazardous wastes, which require special handling and disposal.

d. **Asbestos Containing Material (ACM):** Due to the age of many of the buildings and structures on KSC and CCAFS, it is likely that if your project affects an existing facility, ACM may be encountered. If the project involves new construction or is remote from existing structures and/or utilities then it is unlikely that any ACM would be disturbed by your action(s). Many of the existing facilities have already been sampled and the ACM has been identified. Contact the KSC Industrial Hygiene Office at 867-2400 to determine if the project will impact a known ACM source or access the KSC on-line ACM survey database at **http://amis**. If the potential for the presence of ACM exists, sampling must be requested so a determination can be made for all possible sources.

e. **PCBs:** Polychlorinated biphenyls (PCBs) are chemicals that are primarily found in some types of fluids used in electrical equipment, i.e., electrical transformers, switches, ballasts, etc. Non-liquid PCBs may also be present in older paint coatings, caulking and other materials. Consequently, all projects or jobs that will come in contact with any fluid-filled electrical equipment or non-liquid materials suspected of containing PCBs should include sampling and analysis for PCBs. A current analysis (within six months) must accompany each fluid-containing piece of electrical equipment requiring disposal.

f. **Painting:** Painting, depending on the method and contents of the paint, can pose significant human health risks as well as generate hazardous or controlled wastes. Use of paint thinner and chemical stripper typically results in generation of wastes requiring special handling and disposal. If known, please indicate if these painting related materials are to be used. If your project includes any painting check yes for this item and include specific information regarding paint contents, other hazardous materials to be used and painting methodology, as applicable.

g. **Paint, Sealant, Caulking Removal:** Removal of existing paint coatings, sealants and caulking can generate hazardous or controlled wastes. In some cases, old paint coatings containing lead and/or other metals as well as non-liquid PCBs will require specific abatement procedures and special disposal of wastes generated. If your project includes any paint, sealant, or caulking removal activities check yes for this item and include specific information regarding paint contents, other hazardous materials to be used, and paint or sealant removal methodology.

h. **Dewatering:** If the proposed project will require the pumping of water to support construction activities, a permit may be required. There are a number of variances and quantity thresholds based upon the amount of water being transferred and the area where the water will be discharged. Therefore, if your project requires dewatering, check yes and the EPB will determine permit applicability.

RELEASED - Printed documents may be obsolete; validate prior to use.

i. **Stormwater:** Stormwater, i.e., rain, is an environmental concern primarily due to potential impacts of rainwater run off from an impervious surface into the surrounding area. Secondarily, an impervious surface prevents stormwater from percolating into the ground. Consequently, the St. Johns River Water Management District (SJRWMD) requires a permit to be obtained and a stormwater management system to be constructed when a large impervious surface is created. The threshold for obtaining a permit varies from 4000 square feet for surfaces specifically supporting vehicular traffic, such as roads, parking lots, stabilized areas, etc., to 9000 square feet for buildings inclusive of all other impervious surfaces. The permit threshold can also be "tripped" by adding to or modifying an existing impervious surface, so do not assume the project will not require permitting if new impervious area is below the above thresholds. If you check "yes", please identify the number of square feet involved.

j. **Drinking/FIREX Water:** Check yes if the proposed project involves work that would affect a potable water line. Environmental concerns with work that affects water lines are: 1. The disturbance of a water line typically lowers water quality and therefore, requires disinfection and sampling prior to use; 2. Some connections and/or additions to the existing water system require a permit. Supply as much design information as possible relating to potable water system changes (e.g., new vs. extension, pipe diameter, etc.). Permit determinations and applications will be handled by the Environmental Program Branch (EPB).

k. **Domestic Wastewater/ Industrial Wastewater:** Environmental concerns include potential impacts to the operation of the Wastewater Treatment Plant and Florida Department of Environmental Protection (FDEP) permit conditions. New connections and septic tank installations may require permitting, inspection, and/or certification. Therefore, check yes if the proposed project will involve installation of new wastewater sources or in any way effect the existing sanitary sewer system. Industrial wastewater is any water-based waste stream, discharge, wash water, deluge outfall, etc., that would result from conducting an industrial-type operation. The source of this wastewater typically requires permitting and therefore, must be identified to the environmental office as soon as possible. In addition, early environmental coordination could result in the identification of a process alternative that may preclude or minimize the waste stream.

l. **Air Emissions:** If the project (either during construction or operation) would discharge any substance into the air, other than vehicular or normal construction equipment exhaust, check yes and describe the source of the emission. Some emission sources may require State and/or Federal permitting for both construction and operation.

m. **Open Burning:** If any land clearing debris will be burned during construction, check yes. The Florida Department of Forestry requires notification in accordance with FAC 51-2 Open Burning. coordination with the KSC Fire Marshall is also required

n. **Tanks:** Any vessel that stores liquids, other than drinking water, must be evaluated for potential environmental effects. Some tanks require registration with the State based upon the quantity and type of material being stored. All tanks must be identified in the tank management program and various containment and piping requirements may apply. If you suspect the involvement of any new or existing tanks, including associated piping or containment, check yes and the environmental tank program managers will identify any regulatory requirements.

o. **Transformers/Generators:** If any oil-filled equipment is to be modified, replaced or installed, check yes. There are specific handling, removal and waste disposal guidelines to follow as well as Spill Prevention, Control and Countermeasures (SPCC) requirements to be met.

p. **Exterior Lighting:** Exterior lights at or near Atlantic coastal beaches in Florida have been proven to disrupt sea turtle nesting. Consequently, NASA has developed exterior lighting policies to minimize adverse impacts to threatened and endangered sea turtles that nest KSC beaches. Should the project include exterior lights, either new or replacement of existing, check yes and the EPB will monitor the design of your project to ensure compliance with the applicable policies. Typically, exterior lights that are not directly related to a color rendition or explosion proof requirement will be the lowest wattage, low pressure sodium fixtures that meet the needs of your request. Exterior lighting requirements are located on the EPB web page at: http://environmental.ksc.nasa.gov/projects/documents/ExteriorLightingGuidelines.pdf.

q. **Radiation:** Various types of mission related equipment have the potential to emit radiation that could affect human health and the well being of other living organisms. Typically, the project/job requestor is aware of the dangers associated with the equipment being constructed, installed or worked on. However, in some cases, work may be requested that would take place within a zone of influence for an existing piece of equipment, thereby requiring shut-down or some other operational constraint. Therefore, if you know the project will involve a radiation source, or is in the vicinity of a potential source of radiation (radar, microwave transmitter, etc.) check yes.

r. **Other:** If aspects of the proposed project do not fit into any of the above categories, but may have an effect on the natural environment, explain in the space provided. This space should also be used to explain or identify specific aspects of the above items, as necessary. If there is not enough space to adequately explain the item you are describing, please attach an additional sheet and reference a continuation sheet in case they should become separated.

RELEASED - Printed documents may be obsolete; validate prior to use.

EXHIBIT 6-2
KSC RECORD OF ENVIRONMENTAL CONSIDERATION (REC)

RELEASED - Printed documents may be obsolete; validate prior to use.

Avoid Verbal Orders

KSC-PLN-1733 Rev A-1

TO: Ismael H. Otero, TA-B3A, 861-3726 **DATE:** 7/11/2014

FROM: TA-A4C/Environmental Management Branch

SUBJECT KSC Record of Environmental Consideration (REC) **REC #:** 9369

1. PROJECT INFORMATION

Project Title: Deconstruct Facilities & Structures, Various FY15

Project Lead: Ismael H. Otero, TA-B3A, 861-3726 **Directorate Project No.:** 99008.2 (REV A)

Project Description Update to remove J6-0553 and J6-0553A from demolition project. Add Building 60540/Solar Array Test Building.
Also still includes M7-0656, M7-0657, K7-1557, K7-1557A, and 55005

*** REVISED 4/10/2014 update Historic and SWMU sections. JSS***

EPB Reviewer: LPH **Facility No.:** M7-0656&0657, K7-1557&1557A,55005,60540

2. NEPA DETERMINATIONS

- ☑ **a. Categorical Exclusions per 14 CFR Part 1216.304(d**
- ☐ **b. Environmental Assessment (EA) Required**
- ☐ **c. Environmental Impact Statement (EIS) Required**
- ☐ **d. Existing FONSI or ROD**
- ☐ **e. Centerwide EIS**
- ☐ **f. AF Project on KSC/813**
- ☑ **g. NASA Project on CCAFS/813**

3. ENVIRONMENTAL REQUIREMENTS

a. Non-Permit Requirements	☑ **YES**	☐ **NO**
b. Permit Requirements	☑ **YES**	☐ **NO**

**********PREVIOUSLY ISSUED 4/7/2014 JSS**********
**********REVISED 4/10/2014; to update Historic/SWMU sections JSS**********
**********REVISED 7/11/2014 LPH updated list of facilities to be demolished, SWMU, Historic Resources, Stormwater Permit statements**********

NOTE: This REC covers the general concept of the deconstruction, but details in this draft design are lacking as to the extent of structure/slab/parking lot deconstruction/removal. When those details are developed, a request should be initiated by the project proponent to revise this REC or create a new one to address those details-(NASA Environmental Assurance Branch)

The NASA Environmental Management Branch (TA-A4C) has assigned Lisa Ruffe, IHA-200, 867-6694 as the Environmental Point Of Contact (EPOC) for this project. Please add Ms. Ruffe's name to any lists or notifications of meetings related to this project. All questions relating to environmental issues should be forwarded to the EPOC section within the NASA Environmental Management Branch.

Facilities to be abandoned/deconstructed under this project include:
M7-0656/Parachute Storage Building
M7-0657/Parachute Refurbishment Facility
K7-1557/Instrumentation Facility Building
K7-1557A/Generator Building
55005/Hangar M Annex
60540/Solar Array Test Building

2.a.1. NASA PROJECT ON AF PROPERTY: Facilities 55005 and 60540 are located on CCAFS property. Coordination with the 45th CES/CEAO is required prior to any abandonment/deconstruction activity at these facilities. AF Form 813 must be completed for project review by the Air Force. Contact Eva Long (853-0960, 45 CES/CEAO) if clarification is required.

2.a.2. CATEGORICAL EXCLUSION (CATEX): This project is categorically excluded (CATEX) from further NEPA review as defined in 14 CFR 1216.304(d)(2)(i) Routine maintenance, minor construction or rehabilitation, minor demolition, minor modification, minor repair, and continuing or altered operations at, or of, existing NASA or NASA-funded or -approved facilities and equipment, such as buildings, roads, grounds, utilities, communication systems, and

RELEASED - Printed documents may be obsolete; validate prior to use.

ground support systems, such as space tracking and data systems. For additional information, please contact Don Dankert of the NASA Environmental Management Branch (TA-A4C, 861-1196).

3.a.1. HAZARDOUS/NON-HAZARDOUS WASTE: All hazardous waste and non-hazardous wastes generated on KSC or at NASA controlled facilities must be managed, controlled and disposed of per the KSC Waste Management requirements outlined in KNPR 8500.1. All hazardous and potentially hazardous items must be removed from the structures prior to demolition to prevent possible release of contaminants to the environment (i.e. fluorescent tubes, lighting ballasts, mercury containing devices (thermostats), Freon, abandoned waste collection drums, etc.). A Process Waste Questionnaire (PWQ), KSC Form 26-551 along with any supporting documentation (MSDS, product formulation, lab analyses) must be submitted to the IHA Waste Management Office for each waste stream generated. That office will then generate a Technical Response Package (TRP) which will give direction on proper handling, storage, and disposal of the waste stream. Please contact IHA Waste Management Services at 867-8640 if assistance is required.

3.a.2. SOLID WASTE MANAGEMENT UNIT (SWMU) & POTENTIAL RELEASE LOCATIONS (PRLs): A number of the facilities/structures to be demolished are within the footprint of SWMUs/PRLs being investigated by the NASA Remediation Group. A SWMU designation means a site has had historical operations which impacted the environment. A PRL designation means a site may have had historical operations which had the potential to impact the environment. The respective Remediation Project Manager (RPM) can provide specific guidance regarding handling of soil and/or groundwater at each location.

M7-0656 (Parachute Storage Building) & M7-0657 (Parachute Refurbishment Facility)
Facilities M7-0656 & M7-0657 are located within the boundary of the following SWMU/PRL sites:
SWMU #023 Parachute Facility
PRL #068 PRF Cooling Tower Discharge
PRL #113 Parachute Refurbishment Facility
All three sites have been designated No Further Action (NFA). There are no known soil or groundwater contamination issues at these locations.

K7-1557 (Instrumentation Facility Building) & K7-1557A (Generator Building)
PRL 166 (Instrumentation Facility Building Area, RPM Anne Chrest, 867-2056): K7-1557 is located within PRL 166. There is no known groundwater contamination at the site. An interim measure implemented in 2011 successfully removed all site soils at concentrations above residential soil cleanup target levels. This location is under a No Further Action status and the deconstruction may proceed.

55005 (Hangar M Annex)
Hangar M Annex is located within the boundary or vicinity of the following SWMU sites managed by the AF 45th Space Wing Installation Restoration Program:

#C029/UST and Soakage Pit, No Further Action Planned
#C022/Hangar K - A contaminated groundwater plume from Hangar K extends beneath Hangar M Annex. Coordinate any dewatering activities associated with this deconstruction/demolition with Regina Butler (45 CES/CEAN, 476-2927).

#C186/Substation Transformer/Oil Switch, No Further Action planned

60540 (Solar Array Test Building)
There is no SWMU or soil/groundwater contamination associated with Facility 60540.

3.a.3. SPILL PREVENTION, CONTROL AND COUNTERMEASURES (SPCC) PLAN: The following facility and tank is listed in the Site-Specific SPCC Plan.
-M7-0657 (Parachute Refurbishment Facility) Oil storage associated with this facility includes a transformer tank containing dielectric oil (maintained by ISC-URS High Voltage). Should this transformer need to be decommissioned, coordination with ISC-URS High Voltage is required. There are no SPCC locations listed in the current KSC SPCC plan for the remaining locations covered in this REC.

3.a.4. HAZARDOUS AND CONTROLLED WASTE (ASBESTOS CONTAINING MATERIAL): The Asbestos Management Information System (AMIS) Database contains records on facilities that have been assessed for the presence of asbestos in a limited survey of the facility http://amis.ksc.nasa.gov/. Limited surveys typically do not include destructive sampling or exterior sampling. Asbestos is a regulated substance that was incorporated into many building products and most commonly found in floor tiles, roofing materials, caulking compounds, and insulation media. Consult the Asbestos Management Information System (AMIS) database for records of specific locations and media prior to

deconstruction. Suspect materials must be tested prior to demolition/deconstruction to assure proper handling.

If asbestos will be disturbed, regulations from 62-257 F.A.C. must be followed and notification to the NASA Environmental Assurance Branch (Christine Vanaman, IHA-200, 867-3586) is required for any regulated asbestos removal in order that annual reporting requirements are fulfilled. If less than 260 linear feet, or less than 160 square feet of regulated asbestos containing material (RACM) is to be removed, there are no fee or reporting requirements to the FDEP, unless there is demolition of any load-supporting structural member. If the removal trips these thresholds, or is greater than 1 cubic meter, or 35 cubic feet, regulations require notification to FDEP. The "Notice of Asbestos Renovation or Demolition" (FDEP Form Number 62-257.900(1)) can be found on the FDEP website under "Asbestos Notification" at: http://www.dep.state.fl.us/air/forms.htm. The Permitting and Compliance Group within TA-A4B Environmental Assurance Branch must be copied on all reports submitted to FDEP. For asbestos disposal, IHA Waste Management can supply directions on proper handling, storage, and disposal of the waste stream though the Process Waste Questionnaire/Technical Response Package (PWQ/TRP) process. Please contact IHA Waste Management Services at 867-8642 for assistance.

NOTES:

-Friable asbestos/RACM is not authorized for disposal at the KSC Landfill, but may be acceptable at the CCAFS Construction & Demolition landfill from CCAFS projects.

-Reasonable precautions should be taken to prevent emissions of unconfined particulate matter (dust).

3.a.5. HAZARDOUS AND CONTROLLED WASTE (DEMOLITION OF FACILITIES): This project includes the deconstruction/demolition of load-bearing structures. All demolition activities that destroy the functionality of any load-supporting structural member of a facility, no matter of the size of the facility or the amount of material disturbed, must submit a "Notice of Asbestos Renovation or Demolition" (FDEP Form Number 62-257.900(1)) to the Florida Department of Environmental Protection. NOTE: This form must be submitted regardless of whether Asbestos-Containing Material (ACM) is identified. The FDEP must be notified at least 10 days prior to any demolition activity. The Environmental Assurance Branch Permitting and Compliance Group (Christine Vanaman, IHA-200, 867-3586) must be copied on all reports submitted to FDEP. Please contact Christine if clarification of this requirement is necessary.

3.a.6. HAZARDOUS AND CONTROLLED WASTE - POLYCHLORINATED BIPHENYLS (PCBs): There is a potential for this project to encounter PCB contaminated materials/waste (ballasts, oil filled electrical components, caulking, paint coatings, etc.) during demolition. Consult the Asbestos Management Information System (AMIS) database for records of specific locations and media sampled. If PCB content is unknown, sampling must be performed. See KNPR 8500.1 Rev. C, Chapter 19 for PCB management guidelines. In addition to window caulking and electrical equipment, transformer concrete pads and other surrounding materials may contain PCB contamination. To determine if surrounding media and/or surfaces to be disturbed/disposed of have been contaminated with oils containing PCBs contact IHA Waste Management. They will determine the applicable regulatory requirements and guidance for the proper management of the waste PCB materials. Please follow the PWQ/TRP process for waste disposal. Contact IHA Waste Management Services at 867-8642 for assistance.

3.a.7. PAINT DISTURBANCE/REMOVAL: This project will involve disturbance/removal of paint coatings. Unless known to be non-hazardous, the coatings must be sampled and analyzed for the 8 RCRA hazardous metals (Ag, As, Ba, Cd, Cr, Hg, Pb, and Se) and PCBs. Consult the Asbestos Management Information System (AMIS) database for records of specific locations and media sampled. Analysis should be performed by an AIHA certified laboratory. The requirements established in OSHA standards 29 CFR 1926.62 & 29 CFR 1926.1127 for lead and cadmium respectively must be complied with if lead and/or cadmium are present. It is recommended that the control zone and personal protective equipment requirements established in the lead standard be complied with to prevent exposure to workers and adjacent unprotected areas. The sampling analysis will dictate the level of PPE required and the handling/disposal requirements. Contact your company's Safety and Health Office or MESC Industrial Hygiene (IH) for recommendations on personal protective equipment (PPE). IH can be contacted at 321-867-2400 or at KSC-DL-EnvHealth/(KSC-DL-EnvHealth@mail.nasa.gov). Paint chips, rust, debris, blast media, etc. generated during preparation of metal, fiberglass, or concrete surfaces and/or deconstruction will be contained and disposed of according to waste management guidelines given above in item 3.a.1.

3.a.8. RECYCLING AND DISPOSAL OF PAINTED MATERIALS OR OIL-FILLED EQUIPMENT: Painted non oil-filled electrical equipment and other painted materials may go to the KSC Reutilization, Recycling, and Marketing Facility (RRMF) or taken off KSC for salvage by a contractor if PCBs are <50 ppm. Oil-filled and grease or oil-contacted equipment with PCB concentrations <50 ppm in the oil and in the paint on the equipment may go to the contractor or the RRMF for reuse. There is no requirement for TCLP analysis on items to be reused.

Disposal of painted materials: Painted construction and demolition waste items will be accepted at the KSC Class III Landfill without PCB or TCLP analysis but must be managed according to PCB bulk product waste storage regulations until disposal in the landfill. This includes covering the materials and storing them on an impermeable surface for

protection against precipitation and prevention of soil contamination. Oil-filled and grease or oil contacted equipment with PCB concentrations >= 50 ppm in the oil or in the paint on the equipment must be managed as regulated PCB waste. Contact IHA Waste Management Services at 867-8642 for assistance.

3.a.9. RECYCLING: The contractor must make every practical effort to reclaim and segregate materials that have the ability to be recycled. All reclaimed scrap metal, not being recycled by contractor outside of KSC, must be transported to the Reutilization, Recycling and Marketing Facility (RRMF) with a KSC Form 7-49. Please turn these items and the KSC Form 7-49 into RRMF personnel to ensure the proper disposition of the materials prior to leaving the recycling area. For a list of commonly recycled items, or any other information regarding what materials can be recycled or recycling policies at KSC, please contact the Environmental Management Branch (Alice Smith, TA-A4C, 867-8454).

Asphalt waste should be segregated from all other wastes generated, and transported to the KSC Landfill on Schwartz road. This material can be recycled in the form of roadway stabilization within the landfill if not contaminated by other waste streams.

3.a.10. CONCRETE RECYCLING/DISPOSAL: Clean, unstained, unpainted concrete is accepted at the Diverted Aggregate Reclamation and Collection Yard (DARCY) without any sampling and analysis. Painted concrete must have PCB and Total Metals analyses (limited to Pb, Cd, Cr) performed to determine whether it will be accepted at the DARCY for reuse. The results of the analysis must show metal concentrations below the residential cleanup level (Pb = 400 ppm, Cd = 82 ppm, Cr = 210 ppm) and PCB levels below 0.5 ppm. If no testing is done or if PCB and/or Total Metals concentrations are above residential cleanup levels, coated concrete goes to the landfill as construction/demolition debris. When feasible, painted concrete should be segregated from unpainted concrete for placement in the DARCY. No oil-stained concrete will be accepted at the DARCY. Due to the potential for PCB contamination, all removed concrete associated with oil-containing electrical equipment must be disposed through the KSC Waste Management Office as regulated PCB waste. Contact IHA Waste Management Services at 867-8642 for assistance.

3.a.11. THREATENED, ENDANGERED & PROTECTED SPECIES: This project has the potential to impact protected and/or threatened and endangered species including the least tern, black skimmer, osprey, and the gopher tortoise. Measures must be taken to minimize impacts to the habitat. If indications of activity by any protected species are present in the project area, impacts must be evaluated and in the case of the gopher tortoise, the burrows must be identified and avoided if possible. If identified burrows are within the area of construction, relocation of tortoises by qualified personnel will be required. Least terns and black skimmers nest on roofs typically from late April through mid-August. If demo of these facilities is scheduled to occur during nesting season, a biological survey of the roof must be performed. Least Terns do not construct typical nests but use the existing contours of the roof structures, making the identification of eggs very difficult. After the survey and if no eggs are identified or fledglings are present, the project may proceed. Lighting, electrical, and communication structures on KSC have consistently been used by nesting birds such as ospreys. Due to ospreys being protected under the Migratory Bird Treaty Act, and under Florida Administrative Code, their nesting habits on man-made structures has sometimes created impacts. Because of the ospreys' protection under Federal and State laws, disturbance of these nests while occupied with eggs and fledglings is illegal. The potential exists for bats to inhabit voids behind roof flashing, inside expansion joints, and other roof and building spaces. The presence of bats can be determined by trained personnel conducting a biological survey of the project area and if necessary, the bats can be relocated prior to site disturbance.
Contact Becky Bolt (IHA-200, 867-7330) 14 days prior to beginning work in order to schedule a biological survey. Also contact Becky if a nest is observed on any towers or poles to be demolished or modified.

3.a.12. HISTORIC RESOURCES: The Parachute Refurbishment Facility (M7-0657) is individually eligible for listing under the Space Shuttle Program, and Hangar M Annex (55005) and the Solar Array Test Building (60540) are eligible for listing as contributing resources, under the Space Shuttle Program, and the Expendable Launch Vehicle Program, respectively. 36 CFR Part 800, Protection of Historic Properties, requires consultation with the State Historic Preservation Officer (SHPO) when a historic property will be demolished, transferred, leased or sold out of Federal ownership or control to ensure long-term preservation of the property's historic significance. The Section 106 consultation with the FL SHPO has been completed on M7-0657, 55005, and 60540. Recordation efforts are underway for buildings 55005 and 60540. All photo recordation must be complete prior to demolition of 55005 and 60540. Contact Barbara Naylor (TA-A4C, 867-8452) or Nancy English (TA-A4C, 867-6987) to make arrangements for a review prior to removal of any non-personal items or demolition, and for status of recordation efforts.

Facilities M7-0656, K7-1557 and K7-1557A have been evaluated for their historic significance and were determined ineligible for listing on the National Register of Historic Places by NASA and the FL SHPO. Therefore, the deconstruction of these facilities may proceed without further cultural resource requirements for these facilities.

3.a.13. EROSION AND SEDIMENT CONTROL BEST MANAGEMENT PRACTICES (BMPs): Precautions must be made to eliminate or reduce to the greatest extent possible any discharge of sediments outside established project

boundaries. This can be accomplished by initiating a proactive erosion control BMP. Installation and maintenance of turbidity screens (silt fences) and/or floating turbidity booms must be completed prior to initial land disturbance where the possibility of sediment discharge could impact surrounding stormwater conveyances and other surface waters. The screens must be maintained so they remain functional until such time that the newly exposed soils are stabilized with sod or natural vegetation.

3.a.14. REFRIGERANT (HVAC Unit): Freon (Ozone Depleting Substance [ODS]) is a reportable substance under the Toxics Release Inventory (TRI) reporting requirements. Precautions must be taken to prevent any accidental release of refrigerant during the disassembly of existing system and draining of lines. Any releases should be reported to the NASA Environmental Assurance Branch (Hien Nguyen, 867-8455). Prior to demolition, as part of the deconstruction, all refrigerant must be recovered by a certified/trained competent person and unit labeled empty prior to delivery to the Reutilization, Recycling and Marketing Facility (RRMF) if the air conditioning unit is no longer usable. Self-contained, usable equipment (window unit) does not need to be drained but must be accompanied by certification that it is not leaking. A completed KSC Form 7-49 must be provided to the RRMF when the equipment is turned in.

3.b.1. AIR EMISSIONS: The LiOH lab in Hangar M Annex is considered an insignificant emission on the KSC Title V Air Permit (#0090051-018-AV) based on current activities. This is reassessed every five years during Title V Permit renewal. Please notify Christine Vanaman (IHA-200, 867-3586) with any change in status or questions on this subject.

3.b.2. EXCAVATION PERMIT: A KSC Excavation Permit will be required for any digging proposed by this project. Please contact the Utility Locate/Excavation Permit Request Customer Helpline at 867-2406 or go to website at https://installationsupport.ksc.nasa.gov/sgs/apps/epr/default.cfm for an underground utility scan and dig permit.

3.b.3. DOMESTIC/INDUSTRIAL WASTEWATER: K7-1557 is served by a septic tank. This tank was not operated under a permit due to date of installation (1965) and expected type of use. The proper closure and demolition of this septic system should be included in the facility deconstruction. Contact Doug Durham (TA-A4B, 867-8429) with questions about the location of this septic tank system.

3.b.4. NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT: This project may require an NPDES Phase II construction permit for any or all of the locations. If 1 acre or more of land will be disturbed at each location, a National Pollution Discharge Elimination System (NPDES) Construction Activity Permit from the Florida Department of Environmental Protection (FDEP) is required. This includes demolition/construction activity which will disturb less than one acre of land area that is part of a larger common plan of development that will ultimately disturb equal to or greater than one acre of land. A condition of this permit is to provide a Stormwater Pollution Prevention Plan (SWPPP) prior to ground disturbance. The plan must detail erosion and turbidity controls for the site. Information on completing the permit application and development of the SWPPP can be obtained by contacting Doug Durham (TA-A4B) at 867-8429.

3.b.5. ENVIRONMENTAL RESOURCE PERMIT (ERP) STORMWATER: The facilities to be demolished may be located within the footprint of an existing Environmental Resource Permit (ERP) or permitted regional stormwater management system (Region 1, 4-009-16585-7). Existing swales, ditches, dry and wet ponds should not be altered due to demolition activities or used for laydown areas. Stormwater flow patterns should be maintained. If the building slab and or road/parking lot is demolished and removed, resulting in an increase in pervious area (exposed dirt), please forward this information to the Permitting and Compliance Group (Doug Durham, TA-A4B, 867-8429) for permit modification determination.

There is an existing ERP which includes Hangar M Annex and the Solar Array Test Building: Industrial Area Regional Storm Water Improvements, 4-009-92959. Any alteration from permitted conditions will require permit documentation. The stormwater system must be protected for the duration of the project. Contact Jennifer Burns, 853-6536 to provide information on altered conditions or for additional information.

No other environmental issues were identified based upon the information provided in the KSC Environmental Checklist. This Record of Environmental Consideration (REC) does not relinquish the project lead from obtaining and complying with any other internal NASA permits or directives necessary to ensure all organizations potentially impacted by this project are notified and concur with the proposed project.

Due to potential changes in regulations, permit requirements and environmental conditions, statements in this REC are valid for 6 months and subject to review after this period. It is the responsibility of the project lead to notify the Environmental Management Branch (TA-A4C) if the scope of the project has changed since the original checklist was submitted.

Avoid Verbal Orders

KSC-PLN-1733 Rev A-1

TO: Ismael H. Otero, TA-B3A, 861-3726 **DATE:** 7/11/2014

FROM: TA-A4C/Environmental Management Branch

SUBJECT KSC Record of Environmental Consideration (REC) **REC #:** 9369

I. Otero/TA-B3A
cc:
B. Naylor/TA-A4C
N. English/TA-A4C
E. Long/45CES/CEAO
L. Ruffe/IHA-200

4 Upon evaluation of the subject project, the above determinations have been made and identified. Contact the Environmental Management Branch (TA-A4C) at 861-1196 for re-evaluation should there be any modifications to the scope of work.

Don Dankert **7/14/2014 11:40:22 AM**

Date

RELEASED - Printed documents may be obsolete; validate prior to use.

EXHIBIT 6-3
INTERESTED PARTY CONTACTS FOR SECTION 106 CONSULTATION

RELEASED - Printed documents may be obsolete; validate prior to use.

INTERESTED PARTY CONTACTS FOR SECTION 106 CONSULTATION

Air Force Space and Missile Museum
191 Museum Circle
Patrick AFB, Florida 32925
Ms. Emily Perry, Director
Phone: 321-853-9171
airforcespaceandmisslemuseum@patrick.af.mil
http://www.afspacemuseum.org

Apollo One Memorial Foundation, Inc.
P.O. Box 115
Cape Canaveral, Florida 32920-0115
Mr. John H. Johnson, Chairman of the Board
Phone: 321-859-0017
http://www.apollo1.org/default.aspx

Brevard County Historical Commission
308 Forest Avenue
Cocoa, Florida 32922
Mr. Steve Benn, Director Emeritus
Phone: 321-633-1807
http://www.brevardcounty.us/HistoricalCommission

Brevard Cultural Alliance, Inc.
2725 Judge Fran Jamison Way C-307
Viera, Florida 32940
Phone: 321-690-1971
http://myfloridahistory.org/

Brevard Museum of History & Natural Science
2201 Michigan Avenue
Cocoa, Florida 32926
Phone: 321-632-1830
www.nbbd.com/godo/Brevard/museum/

Florida Public Archaeological Network – East Central Region
Brevard Community College
1311 North US Hwy. 1
Building 1, Room 214
Titusville, Florida 32796
Ms. Sarah E. Miller, M.A., RPA, Regional Director
Phone: 904-819-6476
SEMiller@Flagler.edu
www.flpublicarchaeology.org

Historical Society of North Brevard
Associated with (North Brevard Historical Museum)
301 South Washington Avenue
P.O. Box 5265
Titusville, Florida 32783
Mr. Bill Baldwin, President
Phone: 321-269-3658
www.nbbd.com/godo/historicalsociety

RELEASED - Printed documents may be obsolete; validate prior to use.

INTERESTED PARTY CONTACTS FOR SECTION 106 CONSULTATION (cont.)

Indian River Anthropological Society
P.O. Box 73
Cocoa, Florida 32923
Ms. Elaine Williams, President
irasarchaeology@yahoo.com
http://www.nbbd.com/npr/archaeology-iras

North Brevard Heritage Foundation
P.O. Box 653
Titusville, Florida 32781
Ms. Roz Foster, President
Phone: 321-607-0203
roz@callhendry.com
www.nbbd.com/npr/preservation

South Brevard Historical Society
P.O. Box 1064
Melbourne, Florida 32902
Mr. Don Jennings, President
Phone: 321-423-3861, Fax 321-723-6835
www.southbrevardhistory.org

The U.S. Space Walk of Fame Foundation
(associated with Space Walk of Fame Museum)
308 Pine Street
Titusville, Florida 32780
Mr. Charlie Mars
Phone: 321-264-0434
www.spacewalkoffame.com

RELEASED - Printed documents may be obsolete; validate prior to use.

INDIAN TRIBAL CONTACTS FOR SECTION 106 CONSULTATION

Miccosukee Tribe of Indians of Florida

Mr. Fred Dayhoff, Tribal Historic Preservation Officer
P.O. Box 440021, Tamiami Station
Miami, Florida 33144

Mr. Billy Cypress, Chairman
Miccosukee Tribe of Indians of Florida
P.O. Box 440021, Tamiami Station
Miami, Florida 33144
Phone: 305-223-8380; 305-223-1011 FAX
[Tamiami Station, Miami, Florida 33144 for Express mail and Package Delivery]

Muscogee (Creek) Nation, Oklahoma

Emman Spain, Tribal Historic Preservation Officer
P.O. Box 580
Okmulgee, Oklahoma 74447
Phone: 918-732-7731 or 800-482-1979, ext. 7731

Mr. A.D. Ellis, Principal Chief
Muscogee (Creek) Nation of Oklahoma
Office of the Administration
P.O. Box 580
Okmulgee, Oklahoma 74447
Phone: 918-732-7600; 918-765-2911 FAX
[1007 East Eufaula Street, Okmulgee, OK 74447 for
Express mail and Package Delivery]

Mrs. Joyce A. Bear
Manager, Cultural Preservation
Muscogee (Creek) Nation of Oklahoma
P.O. Box 580
Okmulgee, Oklahoma 74447
Phone: 918-732-7731; 918-758-0649 FAX

Poarch Band of Creek Indians of Alabama

Mr. Buford L. Rolin, Chairman
Poarch Band of Creek Indians
5811 Jack Springs Road
Atmore, Alabama 36502
Phone: 251-368-9136; 251-368-1026 FAX

Mr. Robert Thrower
Tribal Historic Preservation Officer
Poarch Band of Creek Indians
5811 Jack Springs Road
Atmore, Alabama 36502
Phone: 251-368-9136; 251-368-4502 FAX

RELEASED - Printed documents may be obsolete; validate prior to use.

Seminole Tribe of Florida

Dr. Paul Backhouse, Tribal Historic Preservation Officer
AH-TAH-THI-KI Museum
30290 Josie Billy Hwy, PMB 1004
Clewiston, Florida 33440
Phone: 863-902-1113; 863-902-1117 FAX

Mr. Mitchell Cypress, Chairman
Seminole Tribe of Florida
6300 Stirling Road
Hollywood, Florida 33024
Phone: 954-966-6300; 954-967-3463 FAX

Seminole Nation of Oklahoma
Ms. Natalie Deere, Tribal Historic Preservation Officer
Historic Preservation Office
P.O. Box 1498
Wewoka, Oklahoma 74884
Phone: 405-303-2683, ext. 7001
HPO@seminolenation.com and harjo.n@sno-nsn.gov

Mr. Leonard Harjo, Principal Chief
Seminole Nation of Oklahoma
P.O. Box 1498
Wewoka, Oklahoma 74884
Phone: 405-257-6287; 405-257-6205 FAX
[1/4 Mile East Hwy. 270 & 56 Intersection, Northside Hwy. 270, Wewoka, OK 74884 for Express mail and Package Delivery]
executive1@seminolenation.com

Mr. Ted Underwood
Seminole Nation of Oklahoma
Business & Corporate Regulatory Comm.
Mekusukey Mission
P.O. Box 1768
Seminole, OK 74868
Phone: 405-382-8617; 405-382-8611 FAX

This information was compiled from the NAGPRA Native American Consultation Database at http://grants.cr.nps.gov/nacd/index.cfm
And the Department of the Interior, Bureau of Indian Affairs, Office of Indian Services, Tribal Leaders Directory – Fall/Winter 2014 at http://www.bia.gov/WhoWeAre/BIA/OIS/TribalGovernmentServices/TribalDirectory/

RELEASED - Printed documents may be obsolete; validate prior to use.

EXHIBIT 6-4
UTILITY LOCATE/EXCAVATION PERMIT REQUEST

RELEASED - Printed documents may be obsolete; validate prior to use.

UTILITY LOCATE/EXCAVATION PERMIT REQUEST

1. Date	2. Master Planning Site Plan No.	3. Project (PCN) No.	4. Work Order No.	5. Check One ☐ Permit to Dig ☐ Locate Only/ No Digging

6. Requester's Name **(REQUIRED)**	7. Email **(REQUIRED)**	8. Phone No. **(REQUIRED)**	9. Fax No. **(REQUIRED)**

10. Requester's Company **(REQUIRED)**	11. Mail Code/Address

12. Technical Contact **(REQUIRED)**	13. Email **(REQUIRED)**	14. Phone No. **(REQUIRED)**	15. Fax No. **(REQUIRED)**

16. KSC NASA Contact Name **(REQUIRED)**	17. Email **(REQUIRED)**	18. Phone No. **(REQUIRED)**

19. Building No. **(REQUIRED)**	20. Grid No. **(REQUIRED)**	21. Secondary Location (Bldg. No./Add. Info.) **(REQUIRED)**

22. Estimated Start Date **(REQUIRED)**	23. Estimated End Date **(REQUIRED)**

24. Emergency request justification ***(if required)***

25. Reason for permit/Statement of work **(REQUIRED)**

MAP/SKETCH, WITH AREA TO BE LOCATED/EXCAVATED CLEARLY MARKED, IS ATTACHED (REQUIRED)

See next page for completion and process instructions.

RELEASED - Printed documents may be obsolete; validate prior to use.

INSTRUCTIONS

Please complete as many fields as possible.

NOTE: ALL FIELDS INDICATING "(REQUIRED)" MUST PROVIDE INFORMATION.

Block 1	Date submitted.
Block 2-4	Provide related Site Plan, PCN or Work Order Numbers.
Block 5	Check one. If you are NOT going to dig, but need an underground utility locate, check "Locate Only".
Block 6-18	Enter the name, email address, phone, fax number, company name, and address of the person who will be receiving this permit including KSC NASA Contact for Project.
Block 19-20	Enter the building number where work will be performed (or closest building number).
Block 21	Enter additional information as necessary.
Block 22	Enter the date excavation is expected to begin.
Block 23	Enter the date excavation is expected to be complete. Permit will be closed on this date. End date may not be longer than one year from the start date.
Block 24	If excavation is of an emergency nature and requires priority, enter justification.
Block 25	Enter a description of why this permit is being requested, i.e., what work will be performed and why.

REQUIRED: ATTACH A MAP/SKETCH WITH AREA TO BE LOCATED/EXCAVATED CLEARLY MARKED.

1. Email, fax or hand-carry this request, along with a map, drawing or sketch to the Excavation Permit Request (EPR) Administrator using the contact information below.

2. You may contact the EPR Administrator using the contact information below if you have any questions on the dig permit process.

3. To schedule an appointment with the Excavation Permit Inspectors to locate underground utilities and/or obtain an approval signature on this permit to dig, Requester should phone the Excavation Permit Inspectors' Office (321-861-3375/6869 or 321-749-4840 or 321-289-2372) at least 72 hours prior to digging.

4. Requester should notify the EPR Administrator when excavation is complete.

5. Permits may be extended for up to one year by calling the EPR Administrator, but all permits will be closed upon expiration unless notified.

EPR Administrator

Location	**KSC Headquarters, M6-0399, Room 3145**
Mail Code	**ISC-4026**
Phone	**(321)867-2406**
Fax	**(321)867-1175**
Email	**KSC-ISC-DIGPERMIT@mail.nasa.gov**

Emergency requests will be processed on a real time basis
through the ISC Duty Office 861-5050, Fax (861-1627)
or Email - KSC-ISC-DutyOffice@mail.nasa.gov

RELEASED - Printed documents may be obsolete; validate prior to use.

EXHIBIT 6-5
DHR SUFFICIENCY CHECKLIST

RELEASED - Printed documents may be obsolete; validate prior to use.

SUFFICIENCY CHECKLIST

ARCHAEOLOGICAL AND HISTORICAL REPORT REVIEW

Chapter 1A-46, *Florida Administrative Code*

Project File No.: _____
Project Name: _____
Date Received: _____
Reviewer(s): _____
Consulted: _____

Topics Reviewed for Sufficiency:

(a) The general description of the project shall address

Yes	No	
☐	☐	project location (including boundary map)
☐	☐	project description
☐	☐	purpose of project
☐	☐	area of potential effect
☐	☐	pertinent federal, state, or local laws and regulations

(b) Archival research shall address

Yes	No	N/A	
☐	☐	☐	past field surveys in the project area and the relevance of the major findings to the area currently under study
☐	☐	☐	pertinent data in the Florida Master Site File
☐	☐	☐	pertinent environmental and paleoenvironmental data
☐	☐	☐	pertinent data in other studies appropriate for the research problem
☐	☐	☐	pertinent historical data from records such as plat maps, tract books, subdivision maps, Sanborn maps, city directories, building permits and architectural plans
☐	☐	☐	pertinent information from informants, which shall include the Certified Local Government within whose boundaries the project lies
☐	☐	☐	chronologically arranged narrative of the prehistory and history of the project area and of the significant historical events or developments (including important individuals and institutions) which are necessary to place sites and properties in historic contexts within the project area

(c) The description of the research design shall address

Yes	No	N/A	
☐	☐	☐	objectives
☐	☐	☐	methods
☐	☐	☐	expected results
☐	☐	☐	procedures to deal with unexpected discoveries including the discovery of human remains in accordance with chapter 872.05, Florida Statutes

(d) The description of archaeological fieldwork activities shall address

Yes	No	N/A	
☐	☐	☐	types of sites encountered and evaluated
☐	☐	☐	boundaries of the area investigated
☐	☐	☐	fieldwork methodology and the rationale for its selection
☐	☐	☐	location of all tests and excavations, including maps depicting testing locations and results, site components, integrity of sites and subareas within the sites
☐	☐	☐	information on the location and appearance of features and artifacts, as well as the integrity and boundaries of sites and site components

RELEASED - Printed documents may be obsolete; validate prior to use.

☐	☐	☐	information on any portions of the project area and any portions of identified sites which were not investigated and a statement explaining the reason why investigation did not occur
☐	☐	☐	photographs of each site
☐	☐	☐	photographs and illustrations representative of site subareas or features, or formal excavation units
☐	☐	☐	identification of portions of the project area that were examined but that did not contain archaeological remains
☐	☐	☐	description of special survey techniques including equipment, field methodologies, areas surveyed and not surveyed, a record of the nature and location of all potential historical resources identified and a description of any potential historical resources identified by examination to determine their nature
☐	☐	☐	information on changes in research design or methodology
☐	☐	☐	underwater archaeological survey conducted in accordance with the "Florida Division of Historical Resources Performance Standards for Submerged Remote Sensing Surveys"

(e) The description of historical fieldwork activities shall address

Yes	No	N/A	
☐	☐	☐	boundaries of the area investigated
☐	☐	☐	fieldwork methodology and the rationale for its selection
☐	☐	☐	types of resources identified and evaluated
☐	☐	☐	list of all historical resources within the survey area, including the Florida Master Site File number, with all identified resources plotted on a U.S. Geological Survey (1:24,000) 7.5 minute series topographic quadrangle map
☐	☐	☐	descriptions for all identified resources
☐	☐	☐	photographs or illustrations representative of resources located in the project area
☐	☐	☐	information on any portions of the project area which were not investigated and a statement explaining the reason why investigation did not occur
☐	☐	☐	explanation about those portions of the project area that were examined but that did not contain historical, architectural, engineering, or cultural resources

(f) The description of the results and conclusions of the archaeological resource investigations shall address

Yes	No	N/A	
☐	☐	☐	laboratory methods used to analyze artifacts and other site materials recovered during the archaeological investigations in the project area
☐	☐	☐	curation location of artifacts and project records
☐	☐	☐	findings in relation to the stated objectives of the investigations
☐	☐	☐	assessment of site integrity
☐	☐	☐	methods used to apply National Register criteria for a determination of eligibility and historic context as contained in 36 C.F.R 60
☐	☐	☐	discussion of the completeness of project efforts and the need for any additional identification, evaluation, or documentation efforts
☐	☐	☐	conclusions and analysis of the findings, including a discussion on how the findings contribute to an understanding of the historic work or treatment of the site
☐	☐	☐	bibliography of those sources used

RELEASED - Printed documents may be obsolete; validate prior to use.

(g) The description of the results and conclusions of the historical, architectural, engineering or cultural resource investigations shall address

Yes	No	N/A	
☐	☐	☐	findings in relation to the stated objectives
☐	☐	☐	assessment of the integrity of evaluated sites
☐	☐	☐	methods used to apply National Register criteria for a determination of eligibility and historic context as contained in 36 C.F.R 60
☐	☐	☐	description of the constituent elements that constitute the complete property (e.g. outbuildings, landscape features, etc.) which is determined eligible for listing in the National Register
☐	☐	☐	National Register property boundaries depicted on a scaled site plan sketch
☐	☐	☐	conclusions and analysis of the findings
☐	☐	☐	discussion of the manner in which the resources contribute to an understanding of local, regional, state, or national history and/or architectural history
☐	☐	☐	recommendations regarding the treatment of the resource(s) including but not limited to preservation or avoidance, minimization or mitigation of potential impacts, or no action
☐	☐	☐	discussion of the scope and completeness of the project efforts and the need for any additional identification, evaluation or documentation efforts
☐	☐	☐	location of all curated project records and location of all project records (e.g. photographs, oral interviews, etc.)
☐	☐	☐	bibliography of those sources used

(h) All archaeological fieldwork and historical fieldwork reports shall include the following, either as part of the report or as accompanying documents:

Yes	No	N/A		
☐	☐	☐	1	FMSF Survey Log Sheets, completed in accordance with the "Guide to the Survey Log Sheet" with project boundaries depicted on an attached original or photocopy portion of a U.S. Geological Survey (1:24,000) 7.5 minute series topographic quadrangle map
☐	☐	☐	2	FMSF archaeological site forms, completed in accordance with the "Guide to the Archaeological Site Form, Version 2.2"
☐	☐	☐	3	FMSF historical structure forms, completed in accordance with the "Guide to the Historical Structure Form, Version 3.0"
☐	☐	☐	4	FMSF historical bridge forms, completed in accordance with the "Guide to the Historical Bridge Form"
☐	☐	☐	5	FMSF historical cemetery forms, completed in accordance with the "Guide to the Historical Cemetery Form"
☐	☐	☐	6	Completed FMSF shipwreck forms
☐	☐	☐	7	Completed FMSF archaeological short forms
☐	☐	☐	8	Completed FMSF resource group forms
☐	☐	☐	9	Original or photocopy portion of a U.S. Geological Survey (1:24,000) 7.5 minute series topographic quadrangle maps for all identified sites showing site locations

*N/A Not applicable

Contact: Division of Historical Resources / Compliance Review Section
850-245-6333, SunCom 205-6333 or 800/847-7278

RELEASED - Printed documents may be obsolete; validate prior to use.

EXHIBIT 6-6
SECRETARY OF THE INTERIOR'S GUIDELINES FOR ARCHITECTURAL AND ENGINEERING DOCUMENTATION

RELEASED - Printed documents may be obsolete; validate prior to use.

Leader at (505) 525–4400 or Mark Hakkila, Natural Resource Specialist, at (505) 525–4341.

SUPPLEMENTARY INFORMATION: Violations of these closures and restrictions are punishable by fines not to exceed $1,000 and/or imprisonment not to exceed 1 year. These actions are taken to prevent impacts to soils, native vegetative resources, wildlife habitat, cultural resources, and scenic values, and to protect public health and safety.

Copies of this closure order and maps showing the location of the routes are available from the Las Cruces Field Office, 1800 Marquess, Las Cruces, NM 88005.

Dated: June 12, 2003.

Amy L. Lueders,

Field Manager, Las Cruces.

[FR Doc. 03–18436 Filed 7–18–03; 8:45 am]

BILLING CODE 4310–VC–P

DEPARTMENT OF THE INTERIOR

National Park Service

Announcement of Wrangell-St. Elias National Park Subsistence Resource Commission (SRC); Meeting

AGENCY: National Park Service, Interior.

ACTION: Announcement of Wrangell-St. Elias National Park Subsistence Resource Commission (SRC) meeting.

SUMMARY: Notice is hereby given in accordance with the Federal Advisory Committee Act that a meeting of the Wrangell-St. Elias National Park Subsistence Resource Commissions will be held at Chitina, Alaska. The purpose of the meeting will be to continue work on currently authorized and proposed National Park Service subsistence hunting program recommendations including other related subsistence management issues. The meeting will be open to the public. Any person may file with the Commission a writing statement concerning the matters to be discussed.

The Subsistence Resource Commission is authorized under Title VIII, Section 808, of the Alaska National Interest Lands Conservation Act, Public Law 96–487, and operates in accordance with the provisions of the Federal Advisory Committee Act.

DATES: The meeting dates are:

1. September 25, 2003, 9:30 a.m. to 5 p.m., Chitina Community Hall, Chitina, Alaska.
2. September 26, 2003, 9:30 a.m. to 5 p.m., Chitina Community Hall, Chitina, Alaska.

In accordance with 41 CFR 102–3.150, we may provide less than 15 days notice in the **Federal Register** to convene the Commission prior to the October 7, 2003, South-central Regional Council meeting.

FOR FURTHER INFORMATION CONTACT: Gary Candelaria or Barbara Cellarius, Subsistence, at Wrangell-St. Elias National Park and Preserve, P.O. Box 439, Copper Center, AK 99573, telephone (907) 822–5234.

SUPPLEMENTARY INFORMATION: Notice of this meeting will be published in local newspapers and announced on local radio stations prior to the meetings dates. Locations and dates may need to be changed based on weather or local circumstances.

The agenda for the meeting is as follows:

1. Call to order (SRC Chair).
2. SRC Roll Call and Confirmation of Quorum.
3. SRC Chair and Superintendent's Welcome and Introductions.
4. Review and Adopt Agenda.
5. Review and adopt minutes February 19–20, 2003 meeting.
6. Review Commission Purpose.
7. Status of Membership.
8. Superintendent's Report.
9. Wrangell-St. Elias NP&P Staff Report.
10. Federal Subsistence Board Update.
    a. Review actions taken during May 2003 FSB meeting.
    b. Review new proposals to change Fisheries Regulations.
    c. Update on FSB call for wildlife proposals for the 2004–2005 season.
11. Public and Agency Comments.
12. Work Session (comment on issues, develop new recommendations, prepare letters).
13. Set time and place of next SRC meeting.
14. Adjournment.

Draft minutes of the meeting will be available for public inspection approximately six weeks after the meeting from the Superintendent, Wrangell-St. Elias National Park, at the above address.

Marcia Blaszak,

Deputy Regional Director, Alaska.

[FR Doc. 03–18200 Filed 7–18–03; 8:45 am]

BILLING CODE 4312–HT–M

DEPARTMENT OF THE INTERIOR

National Park Service

Guidlines for Architectural and Engineering Documentation

ACTION: Notice.

SUMMARY: This notice sets forth revisions to the Secretary of the Interior's Guidelines for Architectural and Engineering Documentation. These guidelines are not regulatory and do not set or interpret agency policy. They are intended to provide technical advice on how to produce architectural and engineering documentation.

DATES: Guidelines are effective on Tuesday, April 1, 2003.

FOR FURTHER INFORMATION CONTACT: E. Blaine Cliver, Chief, HABS/HAER/HALS, National Park Service, United States Department of the Interior, Washington, DC 20240–0001 (202–354–2159).

SUPPLEMENTARY INFORMATION: Guidelines are prepared under the authority of section 101(g) and section 110 of the National Historic Preservation Act of 1966, as amended. The revisions contained herein update the Secretary of the Interior's Guidelines for Architectural and Engineering Documentation of September 29, 1983 (**Federal Register**, Vol. 48, No. 190, Thursday, September 29, 1983, pp. 44731–34).

Secretary of the Interior's Guidelines for Architectural and Engineering Documentation

Introduction. The following guidelines provide more specific procedural and technical information on how to produce architectural and engineering documentation and outline one approach to meeting the Secretary of the Interior's Standards. Agencies, organizations or individuals proposing to approach documentation differently may wish to review their plans with the National Park Service.

The Guidelines are organized as follows:

Definitions
Goal of Documentation
Content
Quality
Materials
Presentation
Architectural and Engineering Documentation Prepared for Other Purposes

Definitions. The following definitions are used in conjunction with these guidelines:

Documentation—measured drawings, photographs, histories, or other media that depict historic buildings, sites, structures, objects or landscapes.

Field Photography—photography other than large-format photography (usually 35mm), intended for the purposes of producing documentation.

Field Records—notes of measurements taken, field photographs and other recorded information intended for the purpose of producing documentation.

RELEASED - Printed documents may be obsolete; validate prior to use.

KSC-PLN-1733 Rev A-1

Large-Format Photographs—photographs taken of historic buildings, sites, structures, objects, or landscapes where the dimensions of the negatives are either 4″ × 5″, 5″ × 7″ or 8″ × 10″ and where the photographs are taken with appropriate means to correct perspective distortion.

Measured Drawings—drawings produced according to HABS/HAER/HALS guidelines depicting existing conditions or other relevant features of historic buildings, sites, structures, objects or landscapes. Measured drawings are usually produced in ink on an archival material, such as Mylar.

Written Data—inventory forms, data sheets, historical reports, or other original, written works of varying lengths that describe a building, site, structure, object, or landscape and highlight its historical, architectural, technological, or cultural significance.

Photocopy—a photograph, with large-format negative, of a photograph or drawings.

Select Existing Drawings—drawings of historic buildings, sites, structures, objects or landscapes, whether original construction or later alteration drawings that portray or depict the historic value or significance.

Sketch Plan—a floor or site plan, usually not to exact scale although often drawn from measurements, where the features are shown in proper relation and proportion to one another.

Goal of Documentation. The Historic American Buildings Survey (HABS), the Historic American Engineering Record (HAER), and the Historic American Landscapes Survey (HALS) are the national historical architectural, engineering and landscape documentation programs of the National Park Service. The goal of HABS/HAER/HALS documentation is to provide architects, engineers, scholars, preservationists, and interested members of the public with comprehensive information on the historical, architectural, technological, or cultural significance of a building, site, structure, object or landscape. Placed on permanent deposit at the Library of Congress, HABS/HAER/HALS documentation serves as a permanent record of the growth and development of the nation's built environment.

HABS/HAER/HALS documentation usually consists of measured drawings, large-format photographs and written data that highlight the significance of a building, site, structure, object or landscape. This documentation acts as a form of insurance against fires and natural disasters by permitting the repair and, if necessary, reconstruction of historic resources damaged by such disasters. It is also used for scholarly research, interpretation, and education, and it often provides the basis for enforcing preservation easement. HABS/HAER/HALS documentation is often the last means of preservation of a property: when a property is to be demolished, documentation provides future researchers access to valuable information that otherwise would be lost.

HABS/HAER/HALS documentation is developed in a number of ways. The National Park Service regularly employs summer teams of student architects, engineers, and historians to develop HABS/HAER/HALS documentation under the supervision of National Park Service professionals. The National Park Service also produces HABS/HAER/HALS documentation in conjunction with restoration or other preservation treatment of historic buildings managed by the National Park Service. Federal agencies, pursuant to section 110(b) of the National Historic Preservation Act, as amended, record those historic properties to be demolished or substantially altered as a result of agency action or assisted action (referred to as mitigation projects). Finally, individuals and organizations prepare documentation to HABS/HAER/HALS standards and donate the documentation to the programs.

The Secretary of the Interior's Standards describe in general terms the fundamental principals of HABS/HAER/HALS documentation. They are supplemented by other material describing more specific guidelines, preferred techniques for architectural photography, and formats for written historical reports. This technical information is found in the procedure manuals for the individual programs.

These guidelines contain useful information on how to produce documentation for other archives, such as state or local archives. The State Historic Preservation Officer (SHPO) or the state library should be consulted regarding archival requirements if the documentation is to become part of its collection. In establishing archives, the important questions of durability and reproducibility should be considered in relation to the purposes of the collection.

Documentation prepared for the HABS/HAER/HALS collections must meet the requirements below. The HABS/HAER/HALS office of the National Park Service reserves the right to refuse documentation that does not meet these requirements.

Content

Standard: Documentation shall adequately explicate and illustrate what is significant or valuable about the historic building, site, structure, object or landscape being documented.

Guideline: Documentation shall meet one of the following requirements for content:

A. Level I

1. Drawings: a full set of measured drawings depicting existing or historic conditions
2. Photographs: photographs with large-format negatives of exterior and interior views; photocopies with large-format negatives of select, existing drawings or historic views that are produced in accordance with the U.S. Copyright Act (as amended)
3. Written data: history and description

B. Level II

1. Drawings: select existing drawings, where available, may be photographed with large-format negatives or photographically reproduced on Mylar in accordance with the U.S. Copyright Act, as amended
2. Photographs: photographs with large-format negatives of exterior and interior views, or historic views where available and produced in accordance with the U.S. Copyright Act, as amended
3. Written data: history and description

C. Level III

1. Drawings: sketch plan
2. Photographs: photographs with large-format negatives of exterior and interior views
3. Written data: short form for historical reports

Commentary. The kind and amount of documentation should be appropriate to the nature and significance of the subject. For example, Level I would be inappropriate for a building that is a minor element of an historic district, notable only for context and scale. A full set of measured drawings for such a minor building would be expensive and would likely add little new insight into the growth and development of the built environment at either the local, regional, or national level. Large-format photography (Level III) would be the more appropriate choice for documenting this type of building.

Similarly, the aspect of the building, site, structure, object or landscape being documented should reflect the subject's overall significance. For example, measured drawings of Dankmar Adler and Louis Sullivan's Auditorium

RELEASED - Printed documents may be obsolete; validate prior to use.

Building in Chicago should indicate not only facades, floor plans and sections, but also the innovative structural and mechanical systems that were incorporated into that building. Large-format photography of Gunston Hall in Fairfax County, Virginia, to take another example, should clearly show William Buckland's hand-carved moldings in the Palladian Room, as well as other views, since Buckland's role in the creation of the building is one of the reasons why Gunston Hall is considered architecturally significant.

HABS/HAER/HALS documentation is usually in the form of measured drawings, photographs, and written data. While the criteria in this section have addressed only these media, documentation need not be limited to them. Other media, such as films of industrial processes, can be—and have been—used to document historic buildings, sites, structures, objects and landscapes. If other media are to be used, the HABS/HAER/HALS office should be contacted before recording.

The selection of the appropriate documentation level will vary from one project to the next. For mitigation documentation projects, this level will be selected by the National Park Service Regional Office and communicated to the agency responsible for completing the documentation. Generally, Level I documentation is required for nationally significant buildings and structures, defined as National Historic Landmarks and the primary historic units of the National Park Service.

On occasion, factors other than significance will dictate the selection of another level of documentation. For example, if a rehabilitation of a property is planned, the owner may wish to have a full set of as-built drawings, even though the property may not merit Level I documentation.

HABS Level I measured drawings usually depict existing conditions through the use of a site plan, floor plans, elevations, sections and construction details. HAER Level I measured drawings will frequently depict original conditions where adequate historical material exists, so as to illustrate manufacturing or engineering processes.

Level II documentation differs from Level I by substituting copies of existing drawings, either original or alteration drawings, for recently executed measured drawings. If this is done, the drawings must meet HABS/HAER/HALS requirements outlined below and be free of copyrights. While existing drawings are rarely as suitable as as-built drawings, they are adequate in many cases for documentation purposes. Only when the desirability of having as-built drawings is clear are Level I measured drawings required in addition to existing drawings. If existing drawings are housed and preserved in an accessible archival collection, their reproduction for HABS/HAER/HALS may not be necessary. In other cases, Level I measured drawings are required in the absence of existing drawings.

Level III documentation requires a sketch plan if it helps to explain the structure, site, or landscape. A short historical report should supplement the photographs by explaining what is not readily visible.

The HABS/HAER/HALS office reserves the right to refuse documentation that does not meet these requirements for content.

Quality

Standard: Documentation shall be prepared accurately from reliable sources with limitations clearly stated to permit independent verification of the information.

Guideline: Documentation shall meet the following requirements for quality:

A. Measured drawings: Measured drawings shall be produced from recorded, accurate measurements. Portions of the building that were not accessible for measurement should not be drawn on the measured drawings but clearly labeled as not accessible or drawn from available construction drawings and other sources. No part of the measured drawings shall be produced from hypothesis or non-measurement related activities. Level I measured drawings shall be accompanied by a set of field notebooks in which the measurements were first recorded. Other drawings prepared for Levels II and III shall include a statement describing where the original drawings are located.

B. Large-format photographs: Large-format photographs shall clearly depict the appearance of the property and areas of significance of the recorded building, site, structure, object or landscape. Each view shall be perspective-corrected and fully captioned.

C. Written data: Written history and description for Levels I and II shall be based on primary sources to the greatest extent possible. For Level III, secondary sources may provide adequate information; if not, primary research will be necessary. A frank assessment of the reliability and limitations of the sources shall be included. Within the written history, statements shall be footnoted as to their sources, where appropriate. The written data shall include a methodology section specifying the name of the researcher, date of research, sources consulted, and the limitations of the project.

Commentary. The quality of architectural documentation cannot be easily prescribed or quantified, but it derives from a process in which thoroughness of research and factual accuracy play a large part, and it acts, for better or worse, as a measure of the integrity and reliability of the information. HABS/HAER/HALS promotes documentation of the highest quality and the principle of independent verification of all factual information.

The HABS/HAER/HALS office reserves the right to refuse documentation that does not meet these requirements for quality.

Materials

Standard: Documentation shall be prepared on materials that are readily reproducible, durable and in standard sizes.

Guideline: The following material requirements shall be met for all levels of documentation:

A. Measured Drawings

Readily Reproducible: Ink on translucent material, such as Mylar.

Durable: Ink on archival media.

Standard Sizes: Three sizes: 19″×24″, 24″×36″ or 34″×44″

B. Large-Format Black & White Photographs

Readily Reproducible: One print per negative.

Durable: Photography processed and stored according to archival standards; negatives on safety film only; prints on fiber paper, such as AZO paper; no resin-coated paper.

Standard Sizes: Three sizes: 4″×5″, 5″×7″ or 8″×10″.

C. Large-Format Color Transparencies

Readily Reproducible: One identical black & white negative and print per color transparency; one duplicate transparency and electrostatic or laser copy per color transparency.

Durable: Photography processed and stored according to archival standards

Standard Sizes: Three sizes: 4″×5″, 5″×7″ or 8″×10″

D. Written History and Description

Readily Reproducible: Clean copy for photocopying

Durable: Archival bond

Standard Sizes: 8½″×11″

E. Field Records

Readily Reproducible: Field notebooks may be photocopied. Photo identification sheet shall accompany 35mm negatives and contact sheets.

RELEASED - Printed documents may be obsolete; validate prior to use.

KSC-PLN-1733 Rev A-1

Durable: No requirements.

Standard Sizes: Only requirement is that materials can be made to fit into a 9½″×12″ archival file folder.

Commentary. All HABS/HAER/HALS materials are intended for reproduction. Some 20,000 records are reproduced each year by the Library of Congress. Although field records are not generally reproduced, they are intended to serve as supplements to the formal documentation. The basic durability performance standard (that is to say, life expectancy) for HABS/HAER/HALS materials is 500 years. Ink on Mylar is believed to meet this standard, while color photography does not (although color transparencies are acceptable, their life expectancy is considerably shorter—50 years or less). Field records do not meet this standard but are maintained in the HABS/HAER/HALS collections as a courtesy to collections patrons.

The HABS/HAER/HALS office reserves the right to refuse documentation that does not meet these requirements for materials.

Presentation

Standard: Documentation shall be clearly and concisely produced.

Guideline: The following requirements for presentation shall be met for all levels of documentation:

A. Measured Drawings: Level I measured drawings shall be lettered mechanically (*i.e.*, CAD, Leroy or similar) or in a hand-printed equivalent style. Adequate dimensions shall be included on all sheets. Level III sketch plans should be neat and orderly.

B. Large-format photographs: Level I photographs shall include duplicate photographs that include a scale. Level II and III photographs shall include, at a minimum, at least one photograph with a scale, usually of the principal facade.

C. Written history and description: Data shall be typewritten or laser printed on bond, following accepted rules of grammar.

Commentary. The HABS/HAER/HALS office reserves the right to refuse documentation that does not meet these requirements for presentation.

Architectural and Engineering Documentation Prepared for Other Purposes

Where a preservation planning process is initiated, architectural and engineering documentation, like other treatment activities, is undertaken to achieve the goals identified by that process. Documentation is deliberately selected as a treatment for properties evaluated as significant, and the development of the documentation program for a property follows from the planning objectives. Documentation efforts focus on the significant characteristics of the historic subject, as defined in the previously completed evaluation. The selection of a level of documentation techniques (measured drawings, photography, *etc.*) is based on the significance of the subject and the management needs for which the documentation is being performed. For example, the kind and level of documentation required to record a historic property for easement purposes may be less detailed than the kind and level required as mitigation prior to destruction of the property. In the former case, essential documentation might be limited to portions of the property controlled by the easement (exterior facades, for example), while in the latter case, significant interior architectural features and non-visible structural details would also be documented.

HABS/HAER/HALS encourages other archives to use the Secretary of the Interior's Standards and related HABS/HAER/HALS guidelines as a basis for their own documentation guidelines. Levels of documentation and the durability and sizes of the items may vary depending on the intended use of the materials and various storage and preservation considerations. Review of documentary sources and the periodic verification of factual information in the documentation are among the best means of assuring quality. The reliability of the documentation is only strengthened by an accounting of the limitations of the research and physical examination of the property, and by retaining the primary data (field measurements and notebooks) from which the archival record was produced. The long-term usefulness of the documentation is directly related to the quality and durability of the materials (ink, paper, film, *etc.*) used to record the historic resource.

Dated: March 18, 2003.

E. Blaine Cliver,

Chief.

[FR Doc. 03–18197 Filed 7–18–03; 8:45 am]

BILLING CODE 4312–52–P

INTERNATIONAL TRADE COMMISSION

[Investigation No. 731–TA–1023 (Final)]

Certain Ceramic Station Post Insulators From Japan

AGENCY: United States International Trade Commission.

ACTION: Scheduling of the final phase of an antidumping investigation.

SUMMARY: The Commission hereby gives notice of the scheduling of the final phase of antidumping investigation No. 731–TA–1023 (Final) under section 735(b) of the Tariff Act of 1930 (19 U.S.C. 1673d(b)) (the Act) to determine whether an industry in the United States is materially injured or threatened with material injury, or the establishment of an industry in the United States is materially retarded, by reason of less-than-fair-value imports from Japan of certain ceramic station post insulators.[1]

For further information concerning the conduct of this phase of the investigation, hearing procedures, and rules of general application, consult the Commission's Rules of Practice and Procedure, part 201, subparts A through E (19 CFR part 201), and part 207, subparts A and C (19 CFR part 207).

EFFECTIVE DATE: June 16, 2003.

FOR FURTHER INFORMATION CONTACT: John Cutchin (202–205–3396), Office of Investigations, U.S. International Trade Commission, 500 E Street SW, Washington, DC 20436. Hearing-impaired persons can obtain information on this matter by contacting the Commission's TDD terminal on 202–205–1810. Persons with mobility impairments who will need special assistance in gaining access to the Commission should contact the Office of the Secretary at 202–205–2000. General information concerning the Commission may also be obtained by accessing its internet server (*http://www.usitc.gov*). The public record for this investigation may be viewed on the Commission's electronic docket (EDIS) at *http://edis.usitc.gov.*

SUPPLEMENTARY INFORMATION:

Background.—The final phase of this investigation is being scheduled as a result of an affirmative preliminary determination by the Department of Commerce that imports of certain

[1] For purposes of this investigation, the Department of Commerce has defined the subject merchandise as ''station post insulators manufactured of porcelain, of standard strength, high strength, or extra-high strength, solid core or cavity core, single unit or stacked unit, assembled or unassembled, and with or without hardware attached, rated at 115 kilovolts (kV) voltage class and above (550 kilovolt Basic Impulse Insulation Level (BIL) and above), including, but not limited to, those manufactured to meet the following American National Standards Institute, Inc. (ANSI) standard class specifications: T.R.–286, T.R.–287, T.R.–288, T.R.–289, T.R.–291, T.R.–295, T.R.–304, T.R.–308, T.R.–312, T.R.–316, T.R.–362 and T.R.–391. Subject merchandise is classifiable under subheading 8546.20.00 (statistical reporting number 8546.20.0060) of the Harmonized Tariff Schedule of the United States (HTS).

RELEASED - Printed documents may be obsolete; validate prior to use.

EXHIBIT 6-7
COPYRIGHT RELEASE FORM

RELEASED - Printed documents may be obsolete; validate prior to use.

United States Department of the Interior

NATIONAL PARK SERVICE
1849 C Street, N.W.
Washington, D.C. 20240

IN REPLY REFER TO:

RELEASE AND ASSIGNMENT

I, _____, am the owner, or am authorized to act on behalf of the owner, of the materials described below including but not limited to copyright therein, that the National Park Service has requested to use, reproduce and make available as public domain materials at the Library of Congress as part of the Historic American Buildings Survey/Historic American Engineering Record collections. (If not the sole copyright owner, please specify in the space below any additional permissions needed, if any, to grant these rights.) I hereby transfer and assign to the National Park Service any and all rights including but not limited to copyrights in the materials specified below.

Survey Number: HABS No. _____ *or* HAER No. _____

Types of Materials (please check all that apply):
Photographs ____ Illustrations ____ Textual materials ____ Oral History/Interviews ____
Audiotape ____ Videotape ____ Other (describe) _____

Detailed Description of Materials (attach additional pages if necessary):

_____

_____

_____

Additional Permissions Needed, if any (for example, copyright owner, subjects in photographs, illustrations in text):

_____

Disposition of Materials After Use (please check one): ____ Return to owner
____ May be retained

_____	_____	_____
Name (please print)	Signature	Date
_____	_____	
Address	Telephone Number	

RELEASED - Printed documents may be obsolete; validate prior to use.

Chapter 7.0 BIBLIOGRAPHY AND REFERENCES CITED

Advisory Council on Historic Preservation (ACHP). *Balancing Historic Preservation Needs with the Operation of Highly Technical or Scientific Facilities.* Washington, D.C. 1991.

ACHP. *Consideration of Highly Technical and Scientific Facilities in the Section 106 Process*. Washington, D.C. 1995.

ACHP. Recommended Approach for Consultation on Recovery of Significant Information from Archeological Sites. http://www.achp.gov/archguide.html. Updated April 26, 2002.

ACHP. The Relationship Between Executive Order 13007 Regarding Indian Sacred Sites and Section 106. http://www.achp.gov/eo13007-106.html. Updated August 22, 2005.

ACHP. Advisory Guidelines Implementing Executive Order 13287, Preserve America Section 3: Reporting Progress on the Identification, Protection, and Use of Federal Historic Properties. http://www.preserveamerica.gov/FINAL_Section%203%20Advisory%20Guidelines_Aug%202007.pdf. August 2007.

ACHP. Consulting with Indian Tribes in the Section 106 Review Process: A Handbook. http://www.achp.gov/regs-tribes.html. 2008.

Anon. *Facts: John F. Kennedy Space Center*. 1994.

Anon. Preliminary Report for Archaeological Research Conducted at Mosquito Lagoon House of Refuge (8VO2500 or CANA 64), Canaveral National Seashore. On file, SEAC, NPS, Tallahassee. February 2008.

Archaeological Consultants, Inc. (ACI). Archaeological Survey to Establish Zones of Archaeological Potential (ZAPs) in the VAB and Industrial Areas of the Kennedy Space Center. On file, NASA, KSC. 1990.

ACI. Archaeological Survey to Establish Zones of Archaeological Potential (ZAPs) in the Launch Complex Area (Option 1) of the Kennedy Space Center. On file, NASA, KSC. 1991.

ACI. Archaeological Survey to Establish Zones of Archaeological Potential (ZAPs) in the Shuttle Landing and KSC South Area (Option 2) of the Kennedy Space Center. On file, NASA, KSC. 1992a.

ACI. Archaeological Survey to Establish Zones of Archaeological Potential (ZAPs) in the KSC North Area (Option 3) of the Kennedy Space Center. On file, NASA, KSC. 1992b.

ACI. Archaeological Survey to Establish Zones of Archaeological Potential in the KSC North Area (East of State Road 3) (Basic Contract Area) of the Kennedy Space Center. On file, NASA, KSC. 1996.

ACI. Survey and Evaluation of the Historic Facilities within the Industrial, Launch Complex 39 (LC-39), Vehicle Assembly Building (VAB), and Shuttle Landing Facility (SLF) Areas of the John F. Kennedy Space Center (KSC), Brevard County, Florida, with a Reassessment of the Existing National Register of Historic Places LC-39 Site. On file, NASA, KSC. 1998a.

ACI. An Inventory and Assessment of Archaeological Collections at the John F. Kennedy Space Center with Recommendations for Curation. On file, NASA, KSC. 1998b.

ACI. Management of Records Associated with Cultural Resources at the John F. Kennedy Space Center. On file, NASA, KSC. 1998c.

RELEASED - Printed documents may be obsolete; validate prior to use.

ACI. Survey and Evaluation of NASA Facilities Within the Cape Canaveral Air Force Station. On file, NASA, KSC. 2001.

ACI. Cultural Resource Assessment Survey of the Proposed International Space Research Park (ISRP) at the John F. Kennedy Space Center, Brevard County, Florida. On file, NASA, KSC. 2003.

ACI. Survey and Evaluation of NASA-owned Historic Facilities and Properties in the Context of the U.S. Space Shuttle Program, John F. Kennedy Space Center, Brevard County, Florida. On file NASA, KSC. 2006.

ACI. Cultural Resource Assessment Survey of the Proposed Commercial Vertical Launch Complex (CVLC) at the John F. Kennedy Space Center, Brevard County, Florida. On file, NASA, KSC. 2008.

ACI. Historic Context and Historic Period Archaeological Site Location Predictive Model for the John F. Kennedy Space Center, Volusia and Brevard Counties, Florida. On file NASA, KSC. 2009.

ACI. Archaeological Survey and Evaluation of the Bottle Dump Site (8BR2364), John F. Kennedy Space Center, Brevard County, Florida. On file, NASA, KSC. 2009a.

ACI. Historical Survey and Evaluation of the Space Station Processing Facility, John F. Kennedy Space Center, Brevard County, Florida. On file, NASA, KSC. 2010.

ACI. Historical Survey and Evaluation of the Jay Jay Bridge, Railroad System, and Locomotives, John F. Kennedy Space Center, Brevard County, Florida. On file, NASA, KSC. 2012.

ACI Archaeological Survey and Evaluation for the Post-Hurricane Sandy Dune Repair Project, John F. Kennedy Space Center, Brevard County, Florida. On file, NASA, KSC. 2013.

Austin, Robert J. and Sylvia M. Layman. An Archaeological Site Inventory and Management Plan for Volusia County, Florida. On file, Volusia County Planning and Zoning Department, DeLand, and Janus Research, St. Petersburg. 1989.

Barton, David F. and Richard S. Levy. An Architectural and Engineering Survey and Evaluation of Facilities at Cape Canaveral Air Force Station, Brevard County, Florida. Bloomington, Indiana: Resource Analysts, Inc. 1984.

Bense, Judith A. and John C. Phillips. Archaeological Assessment of Six Selected Areas in Brevard County: A First Generation Model. *Report of Investigations* Number 32, Institute of West Florida Archaeology,The University of West Florida, Pensacola. 1990.

Brewer, David M. An Archaeological and Ethnohistorical Overview and Assessment of Mosquito Lagoon at Canaveral National Seashore, Florida. M.A. Thesis, Department of Anthropology, Florida State University, Tallahassee. 1991a.

Brewer, David M. Memorandum to Chief, SEAC RE: Trip Report, SEAC Accession 963 [CANA Acc. #22]: Evaluation of Impact Caused by Clearing of Mosquito Control Dikes at Midden Sites CANA 53, CANA 55, CANA 56, and CANA 57, and Reconnaissance of CANA 54, Canaveral National Seashore, September 9-11, 1991. On file, SEAC, NPS, Tallahassee. 1991b.

Brewer, David M. Memorandum to Chief, SEAC RE: Archaeological Clearance of Mosquito Control Dikes in the Area of Pardon Island (including the sites: Beach Road Hammock [CANA 42/8Br153], Pardon Island [CANA 43/8Br183], and Widgeon Bay [CANA 44/8Br184], Canaveral National Seashore, SEAC Acc. 995, February 20-21, 1992. On file, SEAC, NPS, Tallahassee. 1992.

RELEASED - Printed documents may be obsolete; validate prior to use.

Brewer, David M. Trip Report, Results of Pre-Development Testing at Seminole Rest (CANA 0063/08VO124), Canaveral National Seashore, December 15, 1999, SEAC Acc. 1441. On file, SEAC, NPS, Tallahassee. 2000.

Brewer, David M., John E. Cornelison, and William Brian Yates. A Beach-Face Magnetometer Survey at Canaveral National Seashore. A Regionwide Archaeological Survey Program Project, SEAC Acc. 1227. On file, SEAC, NPS, Tallahassee. 1998.

Brewer, David M. and Elizabeth A. Horvath. *In Search of Lost Frenchmen*. *Report on the 1990 and 1995 Archeological Investigations at the Oyster Bay Site (CANA-73, 8VO3128), Canaveral National Seashore, Volusia County, Florida*. Southeast Archeological Center, Tallahassee. 2004.

Bryne, Stephen C. Archaeological Investigations of Packages 107 and 300(1), Canaveral National Seashore, Brevard and Volusia Counties, Florida. On file, SEAC, NPS, Tallahassee. 1989a.

Bryne, Stephen C. Evaluation of Alternative Comfort Station Locations, Playalinda Beach Parking Area No. 8, Canaveral National Seashore, Volusia County. On file, SEAC, NPS, Tallahassee. 1989b.

Bullen, Ripley P., Adelaide K. Bullen, and William J. Bryant. Archaeological Investigations at the Ross Hammock Site, Florida. The William L. Bryant Foundation, *American Studies Report* Number 7. 1967.

Bullen, Ripley P. and Frederick W. Sleight. Archaeological Investigations of the Castle Windy Midden, Florida. The William L. Bryant Foundation, *American Studies Report* Number 1. 1959.

Bullen, Ripley P. and Frederick W. Sleight. Archaeological Investigations at Green Mound, Florida. The William L. Bryant Foundation, *American Studies Report* Number 2. 1960.

Butowsky, Harry A. 1981 *Reconnaissance Survey: Man in Space*. U.S. Department of the Interior, National Park Service, Washington, D.C. November 1981.

Butowsky, Harry A. *Man in Space National Historic Landmark Theme Study*. U.S. Department of the Interior, National Park Service, Washington, D.C. 1984.

Cantley, Charles E., Mary Beth Reed, Leslie Raymer, and Joe Joseph. Historic Properties Survey, Cape Canaveral Air Force Station, Brevard County, Florida. *Technical Report* 183, Stone Mountain, Georgia: New South Associates. 1994.

Collins, Lori D. and Travis F. Doering. Terrestrial and Airborne LiDAR for the Three-Dimensional Documentation of the Elliott Sugar Mill Complex (8VO160) and Environs (DESU), Florida. University of South Florida, Alliance for Integrated Technologies. August 2010.

Deming, Joan (ACI). Letter Report to EG&G Florida, Inc. RE: Archaeological Survey of the NCAR Radar Site. On file, NASA, KSC. 1991a.

Deming, Joan (ACI). Letter Report to EG&G Florida, Inc. RE: Archaeological Survey of the VIP Launch Viewing Area. On file, NASA, KSC. 1991b.

Deming, Joan (ACI). Letter Report to Jones Edmunds & Associates, Inc. RE: Cultural Resources Assessment Survey of a 65-Acre Proposed Landfill Site, Kennedy Space Center, Brevard County, Florida. On file, Florida Division of Historical Resources, Tallahassee. 1993.

Deming, Joan (ACI). Letter Report to Mr. Mario Busacca, NASA, Environmental Management RE: Archaeological Support for Apollo/Saturn V Building Construction. On file, NASA, KSC. 1995.

RELEASED - Printed documents may be obsolete; validate prior to use.

Deming, Joan (ACI). Letter Report to Mr. Mario Busacca, NASA, Environmental Management RE: Archaeological Survey of the Orbiter GSE Storage Facility Area. On file, NASA, KSC. 1996a.

Deming, Joan (ACI). Letter Report to Mr. Mario Busacca, NASA, Environmental Management RE: Archaeological Survey of the Spoil Site 2B Construction Area. On file, NASA, KSC. 1996b.

Dickinson, Martin (Water and Air Resources). Archaeological Survey of the KSC Cargo Hazardous Servicing Facility. On file, NASA, KSC. 1983.

Doran, Glen H., Ed. *Windover: Multidisciplinary Investigations of an Early Archaic Florida Cemetery*. Gainesville, Florida: University Press of Florida. 2002.

Doran, Glen H. And David N. Dickel. Multidisciplinary Investigations at the Windover Site. In *Wet Site Archaeology*, Edited by Barbara A. Purdy, pp. 263-289. The Telford Press, Caldwell, N.J. 1988.

Douglass, Andrew E. Some Characteristics of the Indian Earth and Shell Mounds on the Atlantic Coast of Florida. *American Antiquarian* 7:74-82, 140-147. 1885.

Douglass, Andrew E. Mounds in Florida. *American Antiquarian* 12:105-107. 1890.

Ehrenhard, Ellen B. Archaeological Data Section for a Preliminary Cultural Resource Management Plan, Canaveral National Seashore. On file, SEAC, NPS, Tallahassee. 1982.

Ehrenhard, John E. Canaveral National Seashore: Assessment of Archaeological and Historical Resources. On file, SEAC, NPS, Tallahassee. 1976.

Ehrenhard, John E. Archaeological Monitoring, Boardwalk Construction, Turtle Mound Site, Canaveral National Seashore. On file, SEAC, NPS, Tallahassee. 1980.

Ehrenhard, John E. A Cultural Resource Survey of Three Project Areas at Merritt Island National Wildlife Refuge, Brevard County, Florida. Atlanta, Georgia: Interagency Archaeological Services, National Park Service. 1988.

Finch, Dennis W. Memorandum to Chief, Southeast Archaeological Center RE: Archaeological Monitoring, Canaveral National Seashore. On file, SEAC, NPS, Tallahassee. 1980.

Florida Today. http://www.floridatoday.com/story/tech/science/space/2014/04/30/laser-project-focuses-preservation/8476637/. 2014.

Florida Division of Historical Resources (FDHR). *Draft Comprehensive Historic Preservation Plan*. Tallahassee. 1990.

Goggin, John M. Space and Time Perspectives in Northern St. Johns Archeology, Florida. *Yale University Publications in Anthropology* Number 47. New Haven. 1952.

Griffin, John W. and James J. Miller. Cultural Resource Reconnaissance of Merritt Island National Wildlife Refuge. On file, NASA, KSC. 1978.

Halchin, Jill Y. Trip Report on Archaeological Investigations for a Boardwalk at Eldora, Canaveral National Seashore, Volusia County, Florida, May 10 and July 17, 2001, SEAC Acc. 1597. On file, SEAC, NPS, Tallahassee. October 29, 2001a.

RELEASED - Printed documents may be obsolete; validate prior to use.

Halchin, Jill Y. Trip Report on Archaeological Investigations at Eldora, Bill's Hill and the Bio Lab Dike Road, Canaveral National Seashore, Volusia and Brevard Counties, Florida. SEAC Acc. 1612. On file, SEAC, NPS, Tallahassee. October 29, 2001b.

Halchin, Jill Y. Trip Report, Phase I Testing for Utilities at the Leeper House and Stansfield House, Canaveral National Seashore, Volusia County, Florida, May 2002, SEAC Acc. 1971. On file, SEAC, NPS, Tallahassee. May 2002.

Hellmann, Robert. Trip Report of Archaeological Site Condition Assessments for Canaveral National Seashore, February 21-March 10, 2006 and March 31-April 7, 2006, SEAC. Acc. 2038. On file, SEAC, NPS, Tallahassee. February 2, 2007.

Hellman, Robert. Trip Report Summarizing an Archeological Survey of Mosquito Lagoon, Canaveral National Seashore Undertaken March 8-19 and June 22-July 2, 2009, SEAC Acc. 2227. September 9, 2009.

Hellman, Robert. Trip Report Covering an Archeological Survey of Mosquito Lagoon, Canaveral National Seashore, June 21-July 1, 2010, SEAC Acc. 2311. November 2, 2010.

Hellmann, Robert. Inspection of a Potential Site at Canaveral National Seashore, SEAC Acc. 2646. February 10, 2013.

Hellmann, Robert. Archeological Overview and Assessment. Canaveral National Seashore, Volusia and Brevard County, Florida. 2013.

Hinder, Kimberly (ACI). Cape Canaveral Air Force Station, Launch Complex 34. Historic American Engineering Record (HAER No. FL-8-6) – Photographs, Written Historical and Descriptive Data. June 2003.

History Division of the National Park Service and the U.S. Air Force. Cape Canaveral Air Force Station National Register of Historic Places Inventory – Nomination Form. National Historic Landmark Federal Agency Nomination. September 1, 1983 (revised).

Horvath, Elizabeth A. Preliminary Report on the Archaeological Investigations Conducted for the Proposed Boat Ramp and Parking Lot, North Beach - Canaveral National Seashore. On file, SEAC, NPS, Tallahassee. 1988.

Horvath, Elizabeth A. Memorandum to Chief, SEAC RE: Trip Report for the CANA Oyster Bay (Armstrong) Site Investigations November 16, 1990 – December 18, 19/90 (SEAC Acc. 891, CANA Acc. 21). On file, SEAC, NPS, Tallahassee. 1991.

Horvath, Elizabeth A. Memorandum to Chief, SEAC RE: Trip Report on the Surface Reconnaissance of the CANA/FWS Dikes, June 17-18, 1992 (SEAC Acc. 995). On file, SEAC, NPS, Tallahassee. 1992a.

Horvath, Elizabeth A. Archaeological Investigations at the Armstrong Site: A Preliminary Report on a Possible Ribault Fleet Survivor's Camp. Paper presented at the 1992 Society for Historical Archaeology Conference on Historical and Underwater Archaeology, Kingston, Jamaica (January 8-12, 1992). 1992b.

Horvath, Elizabeth A. Report on the Archaeological Investigations at the Armstrong Site (CANA-073/8VO3128), Canaveral National Seashore, Volusia County, Florida. (With contributions by David M. Brewer). On file, SEAC, NPS, Tallahassee. 1994.

Horvath, Elizabeth A. Final Report on the Archaeological Investigations at the Seminole Rest Site (CANA-063/8VO124), Canaveral National Seashore, Volusia County, Florida. On file, SEAC, NPS, Tallahassee. 1995.

RELEASED - Printed documents may be obsolete; validate prior to use.

Horvath, Elizabeth A. and David M. Brewer. Research Design for the Archaeological Investigations at the Armstrong Site (CANA073/8VO3128 SEAC Acc. 891) Canaveral National Seashore, Volusia County, Florida. On file, SEAC, NPS, Tallahassee. 1990.

Johnson, Robert E. Letter to Mr. A. Goetzfried, EG&G Florida, Inc. RE: An Archaeological Survey of the Proposed Space Station Facilities Site and Child Care Facility Site. On file, NASA, KSC. 1989a.

Johnson, Robert E. Letter to Mr. A. Goetzfried, EG&G Florida, Inc. RE: An Archaeological Survey of the Following Areas of NASA KSC Facility: Proposed "S" Band Antenna Site, Existing "S" Band Antenna Site, Schwartz Road Borrow Area Expansion. On file, NASA, KSC. 1989b.

Johnson, Robert E. Phase III Archaeological Investigation of the Futch Cove Site, 8BR170, at the Kennedy Space Center, Florida. On file, NASA, KSC. 1992.

Johnson, Robert E. and Keith Ashley. Archaeological Site Assessment Survey of the Proposed NASA State Road 3 Expansion Project. On file, NASA, KSC. 1990.

Kaneski, Richard S. Construction of Administrative Office, Merritt Island National Wildlife Refuge, Brevard County, 2009a.

Kaneski, Richard S. T-10J Dike Rehabilitation, Merritt Island National Wildlife Refuge, Brevard County, 2009b.

King, Thomas F. *Places That Count: Traditional Cultural Properties in Cultural Resource Management*. AltaMira Press, Walnut Creek, California. 2003.

Lawson, Charles F. Trip Report on Archaeological and Geophysical Survey of Four Areas at Klondike Beach, Canaveral National Seashore, Volusia County, Florida, April 11-23, 2004, SEAC Acc. 1877. On file, SEAC, NPS, Tallahassee. May 13, 2004.

Lawson, Charles F. Trip Report on Archaeological Testing for the Installation of Three Utility Poles at Seminole Rest; and Post-2005 Hurricane Season Shoreline Survey of Canaveral National Seashore, November 28-December 2, 2005. On file, SEAC, NPS, Tallahassee. January 6, 2006.

Layman, Sylvia M. An Archaeological Site Location Predictive Model, Management Plan, and Site Inventory for Volusia County, Florida. M.A. Thesis, University of South Florida, Tampa. 1990.

LeBaron, J. Francis. Prehistoric Remains in Florida. *Smithsonian Institution Annual Report for 1882*. Washington, D.C. Pp. 771-790. 1884.

Levy, Richard S., David S. Barton, and Timothy B. Riordan (Resource Analysts, Inc.). An Archaeological Survey of Cape Canaveral Air Force Station, Brevard County, Florida. On file, NASA, KSC. 1984.

Long, George A. Indian and Historic Sites Report, John F. Kennedy Space Center, NASA. On file, NASA, KSC. 1967.

Marrinan, Rochelle A. Archaeological Assessment of the Proposed Off-Loading Facility for the Space Shuttle Solid Rocket Booster at Cape Canaveral Air Station. On file, NASA, KSC. 1977.

Marrinan, Rochelle A. Archaeological Assessment of the Proposed Access Road and Parking Lot Sites (Package 107), Apollo Beach, Canaveral National Seashore, Volusia County, Florida. On file, SEAC, NPS, Tallahassee. 1984.

RELEASED - Printed documents may be obsolete; validate prior to use.

Martinez, Carlos A. Cultural Resource Assessment, Field and Documentary Studies Conducted in Support of the Hypergol Logistics Facility Preliminary Engineering Report, Kennedy Space Center, Brevard County, Florida. On file, NASA, KSC. 1977a.

Martinez, Carlos A. Cultural Resource Assessment, Field and Documentary Studies Conducted in Support of the Chemical Waste Disposal Facilities Preliminary Engineering Report, Kennedy Space Center, Brevard County, Florida. On file, NASA, KSC. 1977b.

McKinnon, Jennifer F. The Archaeology of Florida's US Life-Saving Service Houses of Refuge and Life-Saving Stations. Florida State University Masters Thesis, Electronic Theses, Treatises and Dissertations. Paper 2530, May 22, 2010.

McNeil, Jessica. Trip Report on the North District and Bill's Hill Unit Surveys at Canaveral National Seashore. On file, SEAC, NPS, Tallahassee. February 26, 2007.

Milanich, Jerald T. *Archaeology of Precolumbian Florida*. University Press of Florida, Gainesville. 1994.

Miller, James J. (CRM, Inc.). Letter Report RE: Kennedy Space Center Chemical Waste Disposal Facilities. On file, NASA, KSC. 1979.

Miller, James J. (CRM, Inc.). Letter Report RE: Merritt Island National Wildlife Refuge Service Complex and Visitors Center. On file, NASA, KSC. 1981.

Moore, Clarence B. Mound Investigations on the East Coast of Florida. In *Indian Notes and Monographs*, Museum of the American Indian, Heye Foundation, Miscellaneous Papers, No. 26. New York. 1922.

Mote, James D. Historic Resource Study Status Report, Canaveral National Seashore, Florida. On file, NASA, KSC. 1977.

National Aeronautics and Space Administration (NASA). *Facilities Handbook*. Washington, D.C. No date.

NASA. *America's Spaceport: John F. Kennedy Space Center*. No date.

NASA. *Technical Facilities Catalog Volume II* [NHB 8800.5 (II)]. March 1967.

NASA. *Technical Facilities Catalog Volume II* [NHB 8800.5A (II)]. October 1974.

NASA. *Master Plan: John F. Kennedy Space Center* (Volume I). October 1992.

NASA. Master Plan. http://masterplan.ksc.nasa.gov/, 2012.

NASA KSC. *Environmental Resources Document*, KSC-PLN-1911, Revision E. 2010

NASA KSC. KSC *Environmental Management, Kennedy NASA Policy Directive (KNPD) 8500.1, Rev. C*. 2014.

NASA KSC. *KSC Environmental Requirements, Kennedy Procedural Requiements, KNPR 8500.1, Revision C-1*. February 20, 2014.

NASA KSC. *Final Environmental Assessment for the Construction, Modification, and Operation of Three Facilities in Support of the Constellation Program, John F. Kennedy Space Center, Florida*. KSC Environmental Program Office. April 2007.

National Park Service (NPS). How to Apply the National Register Criteria for Evaluation. *National Register Bulletin* No. 15, Washington, D.C. 1991a.

RELEASED - Printed documents may be obsolete; validate prior to use.

NPS. How to Complete the National Register Registration Form. *National Register Bulletin* No. 16A, Washington, D.C. 1991b.

NPS. How to Complete the National Register Multiple Property Documentation Form. *National Register Bulletin* No. 16B, Washington, D.C. 1991c.

NPS. Guidelines for Evaluating and Registering Historical Archeological Sites and Districts. 1993.

NPS. Guidelines for Architectural and Engineering Documentation. *Federal Register*, Volume 68, No. 139, pages 43159-43162. Monday, July 21, 2003.

National Preservation Institute. NEPA and Section 106 of the National Historic Preservation Act, http://www.npi.org/NEPA/sect106. 2008.

Naylor, Barbara. Kennedy Space Center Historic Properties Mitigation Plan. Kennedy Space Center, Florida: KSC Environmental Management Branch. January 2014.

Naylor, Barbara and Mario Busacca. Cultural Resource Management Transition Plan. Kennedy Space Center, Florida: KSC Environmental Management Branch. November 2007.

New South Associates. Historic Survey and Evaluation, Hypergol Module Processing South (M7-1212) and Boresight Control Building (M7-0867), John F. Kennedy Space Center, Brevard County, Florida. On file, NASA, KSC. 2012.

New South. Architectural Survey and Evaluation of NASA-owned Facilities on Cape Canaveral Air Force Station, On file, NASA, KSC. 2013.

New South. Architectural Survey and Evaluation of 45 Facilities That Have Reached the Age of 45-50 Years, John F. Kennedy Space Center, Brevard County, Florida. On file, NASA, KSC. 2013a.

Penders, Thomas E. A Cultural Resources Assessment Survey of the Clifton Schoolhouse, Brevard County, Florida. CANA #2006-001, SEAC Acc. 02072. May 2008.

Rouse, Irving. A Survey of Indian River Archeology, Florida. *Yale University Publications in Anthropology*, Number 44. New Haven. 1951.

Ruhl, Donna L., Karen J. Walker, and Johanna B. Talcott. Final Report for the Analysis, Cataloging and Curation of Archeobotanical and Archeofaunal Samples from the Opposite Futch Cove Site (8BR170), Kennedy Space Center. University of Florida, Florida Museum of Natural History, Environmental Archaeology Program and Florida Archaeology, Gainesville, Florida. On file, NASA, KSC, August. 2006.

Schwadron, Margo. Preliminary Results of Phase I Survey of the Elliot Point Plantation. On file, SEAC, Tallahassee. October 2008.

Schwadron, Margo. Florida Master Site File Submission: Elliot Plantation March 15, 2013.

Seifert, Donna J., Barbara J. Little, Beth L. Savage, and John H. Sprinkle, Jr. Defining Boundaries for National Register Properties. National Register Bulletin 16, U.S. Department of the Interior, National Park Service. 1997.

Slovinac, Trish (ACI). Cape Canaveral Air Force Station, Launch Complex 34 Operations Support Building (Engineering Support Building). Historic American Engineering Record (HAER No. FL-8-AN) – Photographs, Written Historical and Descriptive Data. September 2007.

RELEASED - Printed documents may be obsolete; validate prior to use.

Smith, Richard L. Archaeological Survey Report: NASA Space Shuttle Runway Project on Merritt Island, Florida. Bureau of Historic Sites and Properties, Division of Archives, History and Records Management, *Miscellaneous Project Report Series*, Number 3. Tallahassee. 1973.

Smith, Richard L. Archaeological Survey Report: NASA Space Shuttle Solid Rocket Booster Facility Site on Merritt Island, Florida. On file, NASA, KSC. 1974.

Ste. Claire, Dana and Robert E. Johnson. Phase II Archaeological Investigations at the Opposite Futch Cove Site (8BR170), Brevard County, Florida. On file, NASA, KSC. 1988.

Stirling, Matthew W. Smithsonian Archaeological Projects Conducted Under the Federal Emergency Relief Administration, 1933-34. *Smithsonian Institution Annual Report*, Washington, D.C. 1934.

Taylor, Bobby Jo. Archaeological Monitoring, Boardwalk Extension Construction, Turtle Mound Site, Canaveral National Seashore. On file, SEAC, NPS, Tallahassee. 1982.

Taylor, Robert C. Archaeological Reconnaissance of the Camera Pad Road Improvements at Playalinda Beach, Canaveral National Seashore. On file, SEAC, NPS, Tallahassee. 1984.

Tesar, Louis D. *The Historic Preservation Compliance Review Program of the Florida Department of State, Division of Historical Resources.* Tallahassee. 1987.

Tesar, Louis D. *The Historic Preservation Compliance Review Program of the Florida Department of State, Division of Historical Resources: A Guide to the Historic Preservation Provisions of State and Federal Environmental Review Laws.* Tallahassee. 1990.

URS Corporation. Executive Order 13287: Recommendations for 2008 Section 3 Report. On file, NASA Headquarters, Environmental Management Division, Washington, D.C. December 2007.

URS Corporation. Understanding NASA's Historic Districts. Washington, D.C.: NASA Headquarters, Environmental Division. June 2008.

U.S. Army Corps of Engineers (ACOE), Mobile District, Environmental Resources Planning Section. Phase I Historic Properties Survey of Several Proposed Projects: Launch Complex 17 Security Fence Upgrade, Area 55 New Building, TGSF Storage Facilities, Launch Complex 41 Line of Sight, Cape Canaveral Air Force Station, Brevard County, Florida. On file, NASA, KSC. 1989.

U.S. Department of Agriculture (USDA). *Soil Survey of Brevard County, Florida*. 1974.

U.S. Department of Agriculture (USDA). *Soil Survey of Volusia County, Florida*. 1980.

U.S. Department of the Interior, Fish and Wildlife Service (FWS). Comprehensive Conservation Plan, Merritt Island National Wildlife Refuge, Brevard and Volusia Counties, Florida. FWS, Southeast Region, Atlanta. August 2008.

Wheeler, Judith K. *KSC Records Management Guide*. NASA, KSC. 1997.

RELEASED - Printed documents may be obsolete; validate prior to use.

Chapter 8.0 FEATURED HYPERLINKS

36 CFR Part 60, National Register of Historic Places
http://faculty.law.lsu.edu/ccorcos/lawctr/lawctr/culturalpropertyweb/36cfr60.html

36 CFR Part 79, Curation of Federally-Owned and Administered Archaeological Collections
http://www.nps.gov/history/archeology/tools/36cfr79.htm

36 CFR Part 800, Protection of Historic Properties
http://www.achp.gov/regs-rev04.pdf

43 CFR Part 7, Protection of Archaeological Resources
http:www.nps.gov/history/local-law/43cfr7.htm

43 CFR Part 10, NAGPRA Regulations
http://www.nps.gov/history/nagpra/MANDATES/43CFR10_10-1-07.htm

Advisory Council on Historic Preservation (ACHP)
http://www.achp.gov/

American Indian Religions Freedom Act of 1978 (AIRFA) Protection and Preservation of Traditional Religions of Native Americans
http://www4.law.cornell.edu/uscode/42/1996.html

Archaeological Resources Protection Act of 1979 (ARPA)
http://www.nps.gov/history/local-law/FHPL_ArchRsrcsProt.pdf

Balancing Historic Preservation Needs with the Operation of Highly Technical or Scientific Facilities
http://www.achp.gov/pubs-scitech.html

Becoming Better Stewards of Our Past: Recommendations for Enhancing Federal Management of Historic Properties (ACHP 2004)
http://www.achp.gov/pubs-2004stewardshipreport.html

Chapter 1A-46, Florida Administrative Code (Archaeological and Historical Report Standards and Guidelines)
https://www.flrules.org/gateway/chapterhome.asp?chapter=1A-46

Chapter 267, Florida Statutes and Constitution (Historical Resources)
http://www.leg.state.fl.us/statutes/index.cfm?Tab=statutes&submenu=1

Chapter 872, Florida Statutes (Offenses Concerning Dead Bodies and Graves)
http://www.flheritage.com/archaeology/cemeteries/index.cfm?page=chapter872#872.05

Consulting with Indian Tribes in the Section 106 Review Process
http://www.achp.gov/regs-tribes.html

Division of Historical Resources (Florida)
http://www.flheritage.com/

Executive Order 11593: Protection and Enhancement of the Cultural Environment
http://www.archives.gov/federal-register/codification/executive-order/11593.html

RELEASED - Printed documents may be obsolete; validate prior to use.

Executive Order 13007: Indian Sacred Sites
http://www.achp.gov/EO13007.html

Executive Order 13084: Consultation and Coordination with Indian Tribal Governments
http://www.nps.gov/nagpra/AGENCIES/EO_13084.htm

Executive Order 13287: Preserve America
http://www.preserveamerica.gov/EOtext.html

Executive Order 13287: Preserve America, Section 3: Reporting Progress on the Identification, Protection, and Use of Federal Historic Properties
http://www.preserveamerica.gov/FINAL_Section%203%20Advisory%20Guidelines_Aug%202007.pdf

Federally-Recognized Indian Tribes (July 12, 2002)
http://www.artnatam.com/tribes.html

Government-to-Government Relationship with Tribal Governments (Sept. 23, 2004, President George W. Bush)
http://www.epa.gov/tribalportal/pdf/president-bush-2004.pdf

Historic American Building Survey (HABS) Guidelines
http://www.cr.nps.gov/hdp/standards/habshistory.pdf

KNPR 8500.1, Rev. C-1, KSC Environmental Requirements
https://tdksc.ksc.nasa.gov/servlet/dm.web.Fetch/KNPR_8500.1__Rev_C-1.pdf?gid=994570&FixForIE=KNPR_8500.1__Rev_C-1.pdf

NPR 8510.1, NASA Cultural Resources Management
http://nodis3.gsfc.nasa.gov/displayDir.cfm?Internal_ID=N_PR_8510_0001_&page_name=main&search_term=8510

National Environmental Policy Act of 1969 (NEPA)
https://ceq.doe.gov/ceq_regulations/regulations.html

National Historic Preservation Act of 1966 (NHPA), as amended
http://www.achp.gov/nhpa.html

National Register of Historic Places (NRHP)
http://www.nps.gov/nr/index.htm

National Register Bulletin, How to Apply the National Register Criteria for Evaluation
http://www.nps.gov/history/nr/publications/bulletins/nrb15/

National Register Bulletin, Defining Boundaries for National Register Properties
http://www.cr.nps.gov/nr/publications/bulletins/boundaries

Native American Graves Protection and Repatriation Act of 1990 (NAGPRA)
http:www.nps.gov/history/local-law/FHPL_NAGPRA.pdf

NEPA and Section 106 of the National Historic Preservation Act
http://www.npi.org/NEPA/sect106

NPD 4300.1B, NASA Personal Property Disposal Policy
http://nodis3.gsfc.nasa.gov/displayDir.cfm?t=NPD&c=4300&s=1B

RELEASED - Printed documents may be obsolete; validate prior to use.

NPD 1440.6H, NASA Records Management
http://nodis3.gsfc.nasa.gov/displayDir.cfm?t=NPD&c=1440&s=6H

NPD 8500.1, NASA Environmental Management
http://nodis3.gsfc.nasa.gov/displayDir.cfm?t=NPD&c=8500&s=1B

NPR 4310.1A, Identification and Disposition of NASA Artifacts
http://nodis3.gsfc.nasa.gov/displayDir.cfm?t=NPR&c=4310&s=1

NPR 8580.1A, Implementing the National Environmental Policy Act and Executive Order 12114
http://nodis3.gsfc.nasa.gov/displayDir.cfm?t=NPR&c=8580&s=1A

The Relationship between Executive Order 13007 Regarding Indian Sacred Sites and Section 106
http://www.achp.gov/eo13007-106.html

Secretary of the Interior's Standards and Guidelines for Archaeology and Historic Preservation
http://www.nps.gov/history/local-law/arch_stnds_0.htm

Secretary of the Interior's Standards and Guidelines for Archaeological Documentation
http://www.nps.gov/history/local-law/arch_stnds_7.htm

Secretary of the Interior's Standards for Architectural and Engineering Documentation
http://www.nps.gov/history/local-law/arch_stnds_6.htm

Secretary of the Interior's Standards and Guidelines for Preservation Planning
http://www.nps.gov/history/local-law/arch_stnds_1.htm

Secretary of the Interior's Standards for Rehabilitation
http://www.nps.gov/tps/standards/rehabilitation/rehab/stand.htm

Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for Preserving, Rehabilitating, Restoring and Reconstructing Historic Buildings
http://www.nps.gov/tps/standards/four-treatments/treatment-guidelines.pdf

Section 106 Regulations Flow Chart Explanatory Material
http://www.achp.gov/flowexplain.html

Section 106 Regulations Users Guide
http://www.achp.gov/usersguide.html

The Secretary of the Interior's Standards and Guidelines for Federal Agency Historic Preservation Programs Pursuant to the NHPA
http://www.gpo.gov/fdsys/pkg/FR-1998-04-24/pdf/98-10972.pdf

Treatment of Burial Sites, Human Remains and Funerary Objects (ACHP Policy Statement, February 23, 2007)
http://www.achp.gov/docs/hrpolicy0207.pdf

RELEASED - Printed documents may be obsolete; validate prior to use.

LIST OF APPENDICES

Chapter 9.0 APPENDICES

APPENDIX A: Glossary of Key Terms

APPENDIX B: Historic Context
- APPENDIX B-1 Precontact Context
- APPENDIX B-2 Historic Context
- APPENDIX B-3 The Space Age Context

APPENDIX C: Original NRHP Nomination for the LC-39 Site

APPENDIX D: Recorded Archaeological Sites Located at KSC

APPENDIX E: NRHP Listed and Eligible Historic Properties

APPENDIX F: Collections from KSC Archaeological Sites

RELEASED - Printed documents may be obsolete; validate prior to use.

APPENDIX A: Glossary of Key Terms

RELEASED - Printed documents may be obsolete; validate prior to use.

Adverse effect: An adverse effect occurs 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" (36 CFR Part 800.5(a)(1)). Adverse effects may include, but are not limited to, physical destruction, damage or alteration to all or part of a resource; isolation of the resource from or alteration of the character of the resource's setting when that character contributes to the resources qualification for the National Register; introduction of visual, audible, or atmospheric elements that are out of character with the resource or its setting; neglect of a resource resulting in its deterioration or destruction; and the transfer, lease, or sale of the resource.

Advisory Council on Historic Preservation (ACHP): An independent agency of the U.S. government whose members are charged with advising the President and Congress on matters relating to historic preservation; recommending measures to coordinate activities of federal, state, and local agencies and private institutions and individuals relating to historic preservation; and advising on the dissemination of information pertaining to such activities. The ACHP reviews the policies and programs of federal agencies in regard to compliance with the NHPA.

Agreement documents: Legal document resulting from Section 106 consultation, which obligates the signing parties to fulfill their Section 106 responsibilities by carrying out its terms. Three kinds of agreement documents include Agreement-based Determinations of No Adverse Effect, Memorandum of Agreement, and Programmatic Agreements.

Archaeological resources: The locations of precontact or historic occupations or activities, which can be used to reconstruct the lifeways of cultures of the past. They may range from a single artifact to the extensive ruins of a historic military fortification. In accordance with the ARPA, archaeological resources are "any material remains of past human life or activities that are of archaeological interest and at least 100 years old."

Archaeological site: The place or places where the remnants of a past culture survive in a physical context that allows for the interpretation of these remains.

Area of potential effects (APE): The geographic area or areas within which an undertaking may directly or indirectly cause alterations in the character or use of historic properties, if any such properties exist. The APE is influenced by the scale and nature of an undertaking. It always includes the actual site of the undertaking and may also include other areas where the undertaking will cause changes in land use, traffic patterns, or other aspects that could affect historic properties.

Area of significance: Aspect of historic development in which a property made contributions for which it meets the National Register criteria, such as engineering or space exploration.

Artifact: An object made or modified by humans. In accordance with NASA, artifacts are "unique specimens relating to the science and technology of aeronautics and astronautics and of flight in the atmosphere and space, including, but not limited to, spacecraft (both manned and unmanned), subsystems of the above, such as rocket engines, pressure suits, personal equipment, instruments, significant recorded data, operating handbooks, photographs, motion picture and still camera film, sound tapes, training devices, simulators, and memorabilia."

Association: The direct link between an important historic event or person and a historic property. One of the seven aspects of integrity required for National Register listing.

Avoidance: Active attempts to deflect harm to cultural resources by partial or complete project redesign or relocation.

Boundaries: Lines delineating the geographical extent or area of a historic property.

Code of Federal Regulations (CFR): A series published by the federal government, which contains codification of the general and permanent rules published by agencies of the federal government.

RELEASED - Printed documents may be obsolete; validate prior to use.

Collection: Any material remains that are excavated or removed during a survey, excavation, or other study of a precontact or historic resource, and associated records prepared or assembled in connection with the survey, excavation, or study.

Consultation: The process of seeking, discussing, and considering the views of other participants, and, where feasible, seeking agreement with them regarding matters arising in the Section 106 process.

Consulting parties: Persons or groups that the federal agency consults with during the Section 106 process, including, but not limited to, the ACHP, the SHPO, THPOs or Indian tribal government officials or representatives, representatives of local governments, and individuals and organizations with a demonstrated interest in the undertaking. Examples of consulting parties are the ACHP; the SHPO; other federal, state, local, or tribal government officials; Native Americans; and members of the public.

Contributing resource: A building, site, structure, or object adding to the significance of a historic property.

Council on Environmental Quality (CEQ): The federal entity that is responsible for the formulation of regulations, guidelines, and policies relative to NEPA.

Cultural context: An organizational format that groups information about related cultural resources, based on a theme, geographical area or cultural landscape, and chronological period. A cultural context describes one or more aspects of the cultural development of an area and identifies the significant human behavior patterns that individual cultural resources represent.

Cultural resource: Any building, site, structure, object, or district that is generally more than 50 years of age and which is evaluated as having significance in American history, architecture, archaeology, engineering, or culture at the national, state, or local level. Includes archaeological sites as well as historic structures. Synonymous with **Historic Property**.

Cultural Resources Assessment Survey (CRAS): The process of identification, documentation, and evaluation of historical, archaeological, architectural, and traditional cultural properties.

Cultural Resource Management (CRM): The management of historic properties and other valued aspects of the physical and social environment and of the impacts they experience.

Curation: The management and care of collections according to common, professional museum practices, including, but not limited to: (1) inventorying, accessioning, labeling and cataloging collections; (2) identifying, evaluating, and documenting collections; (3) storing and maintaining collections under appropriate environmental conditions and physically secure controls; (4) periodically inspecting collections and taking any necessary actions as may be necessary to preserve them; 5) providing facilities and access for studying collections; and (6) cleaning, stabilizing, and conserving collections.

Debitage: Pieces of chipped stone debris resulting from the manufacture and modification of stone tools. Also referred to as **waste flakes**.

Design: The combination of elements that creates the form, plan, space, structure, and style of a property. One of the seven aspects of integrity required for National Register listing.

Disposal: The sale, abandonment, destruction, or transfer of surplus property.

District: A geographically definable area possessing a significant concentration, linkage, or continuity of sites, buildings, structures, or objects united historically or aesthetically by plan or physical development. A district may also comprise individual elements separated geographically, but linked by association or history.

RELEASED - Printed documents may be obsolete; validate prior to use.

Effect: Alteration to the characteristics of a historic property qualifying it for inclusion in or eligibility for the National Register.

Eligible resource: A cultural resource that has been formally determined eligible for National Register listing by the Secretary of the Interior, or one that has not yet gone through the formal eligibility determination process, but meets the National Register Criteria of Eligibility. For Section 106 purposes, an "eligible" resource is treated in the same manner as a listed resource.

Environmental Assessment (EA): A document completed under the requirements of NEPA in order to decide whether an action is a major federal action significantly affecting the quality of the human environment.

Environmental Impact Statement (EIS): A document completed under the requirements of NEPA to assess alternatives for implementing a major federal action significantly affecting the human environment. The Final EIS responds to and incorporates agency and public comments and recommendations.

Evaluation: The process by which a historic property is judged and eligible for its significance and integrity for listing on the National Register.

Excavation: The controlled exposure of subsurface deposits at prehistoric and historic period sites in order to scientifically recover archaeological materials and data from these sites.

Facility: Buildings and other structures, including their functional systems and equipment.

Feeling: A property's expression of the aesthetic or historic sense of a particular period of time. One of the seven aspects of integrity required for National Register listing.

Finding of No Significant Impact (FONSI): A document completed and filed upon reaching the decision, based on an EA, that the proposed action is not a major federal action significantly affecting the quality of the human environment.

Florida Master Site File (FMSF): A comprehensive listing of recorded cultural resources in Florida, including archaeological sites, historic structures, bridges, and cemeteries. It includes records for resources that are no longer extant.

Foreclosure: An action taken by an agency official that effectively precludes the ACHP from providing comments, which the agency official can meaningfully consider prior to the approval of the undertaking.

Funerary objects: "Items that, as part of the death rite or ceremony of a culture, are reasonably believed to have been placed intentionally at the time of death or later with or near individual human remains" (25 USC 3001(3)(B)).

Geographic Information System (GIS): A computer system capable of assembling, storing, manipulating, and displaying geographically or spatially referenced information (i.e., data identified according to their locations).

Ground-truth: Verify location of a suspected site. Can involve excavation of holes or use of remote sensing equipment such as ground penetrating radar.

Historic: The period after the advent of written history in a geographic region. In Florida, the historic period began in the early 1500s with the arrival of Europeans.

Historic American Buildings Survey (HABS): A Heritage Documentation Program of the National Park Service that identifies and records buildings significant in American architecture. Example of HABS at KSC: VAB, LCC.

RELEASED - Printed documents may be obsolete; validate prior to use.

Historic American Engineering Record (HAER): A Heritage Documentation Program of the National Park Service that identifies and records significant American engineering and industrial sites and structures. Examples of HAER at KSC: MLP, Crawlerway.

Historic American Landscapes Survey (HALS): A Heritage Documentation Program of the National Park Service that identifies and records historic landscapes through measured drawings and interpretive drawings, written histories, and large-format black and white photographs and color photographs.

Historic context: An organizing structure for interpreting history that groups information about historic properties that share a common theme, common geographical area, and a common time period. The development of historic contexts is a foundation for decisions about the planning, identification, evaluation, registration, and treatment of historic properties, based upon comparative historic significance.

Historic preservation: The management of historic properties and impacts upon them.

Historic property: "Any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in, the National Register of Historic Places maintained by the Secretary of the Interior. This term includes artifacts, records, and remains that are related to and located within such properties. The term includes properties of traditional religious and cultural importance to an Indian tribe or Native Hawaiian organization and that meet the National Register criteria" (36 CFR Part 800.16(1)). Synonymous with Cultural Resources.

Historic structures: Cultural resources including bridges, residences, commercial buildings, constructed features, etc., which, with few exceptions, are at least 50 years old.

Identification: The inventory of all cultural resources within a project area of potential effect. This is accomplished through archaeological and historic structures surveys.

In situ: The condition of objects that are situated in the location where they were deposited by the people who originally produced or made them.

Integrity: The ability of a property to convey its historical significance. The seven aspects of integrity are **location, design, setting, materials, workmanship, feeling, and association**.

Large-format photographs: In accordance with HABS/HAER documentation standards, photographs taken of historic buildings, sites, structures, objects, or landscapes where the dimensions of the negatives are either 4" x 5", 5" x 7", or 8" x 10" and where the photographs are taken with appropriate means to correct perspective distortion.

Lithics: Stone tools and the debris (debitage or waste flakes) created in the process of tool manufacture/modification.

Location: The place where the historic property was constructed or the place where the historic event occurred. One of the seven aspects of integrity required for National Register listing.

Maintenance: The act of preventing deterioration through regular treatment.

Materials: The physical elements that were combined or deposited during a particular period of time and in a particular pattern or configuration to form a historic property. One of the seven aspects of integrity required for National Register listing.

Memorandum of Agreement (MOA): Document that records the terms and conditions agreed upon to resolve the adverse effects of an undertaking upon historic properties. A three-party MOA is signed by the federal agency, the SHPO, and the Advisory Council; a two-party MOA is when the Advisory Council has not been involved in the consultation, but receives the MOA after the federal agency has prepared it.

RELEASED - Printed documents may be obsolete; validate prior to use.

Mitigation: Any actions that reduce or compensate for the damage an undertaking may have on a National Register listed or eligible property. Mitigation may include project redesign or relocation, data recovery, and documentation.

Monitoring: Periodic inspection of cultural resources to ascertain their condition and assess the effects of natural forces, authorized actions, or illegal acts.

Mothballing: The act of removing a resource from active use and protecting it from deterioration.

Multiple Property Listing (MPL): A group of historic properties related by common theme, general geographical area, and period of time for the purpose of National Register documentation and listing.

National Historic Landmark (NHL): A historic property evaluated and found to have significance at the national level and designated as such by the Secretary of the Interior.

National Register of Historic Places (NHRP): The national list of districts, sites, buildings, structures, and objects significant in American history, architecture, archaeology, engineering, or culture. It is maintained by the National Park Service on behalf of the Secretary of the Interior under authority of the NHPA, as amended. Properties listed may be significant at the national, state, or local level.

National Register eligible: A historic resource (includes archaeological sites) that has been surveyed and determined to meet the criteria of eligibility for listing in the NRHP, but has not been formally nominated to be listed. For the purposes of Section 106 compliance, eligible properties are treated the same as listed properties.

National Register listed: A historic resource (includes archaeological sites) that has been listed by the NPS to the NRHP.

Native American: Of, or relating to, a tribe, people, or culture that is indigenous to the United States.

Native American cultural items: Under NAGPRA, includes human remains of deceased Native Americans, associated and unassociated funerary objects, objects sacred to a Native American group, and objects of cultural patrimony.

Nomination: The official recommendation for listing a property in the National Register, pursuant to Section 110 of the NHPA.

Noncontributing resource: A building, site, structure, or object that does not add to the historic significance of a property.

Object: A material thing of functional, aesthetic, cultural, historical, or scientific value that may be, by nature or design, movable yet related to a specific setting or environment. An example of a KSC object is the Press Site: Clock and Flag Pole.

Objects of cultural patrimony: Under NAGPRA, items having ongoing historical, traditional, or cultural importance central to the Indian tribe or Native Hawaiian organization itself, rather than property owned by an individual tribal or organization member.

Outreach: Activities designed to inform and educate the public about cultural resources and cultural resource management.

Phase I: The first stage in the cultural resource assessment survey process, which entails a “good faith effort” to identify cultural resources within an undertaking’s area of potential effects.

Phase II: In the archaeological site identification and evaluation process, the focus is on the determination of site significance in terms of eligibility for listing in the NRHP. This process usually involves limited test excavation.

RELEASED - Printed documents may be obsolete; validate prior to use.

Phase III: In the archaeological site identification and evaluation process, the focus is on mitigating the adverse effects of an undertaking to NRHP listed or eligible sites through excavation and data recovery.

Precontact: The period of time before the advent of written history in a geographic region. In Florida, this is the time before the arrival of Europeans. Also referred to as **prehistoric**.

Preservation: The maintenance and repair of a property's existing historic materials and design as it evolved over time.

Principal Investigator: A qualified cultural resource professional responsible for the design and implementation of a cultural resources study.

Programmatic Agreement (PA): A document that records the terms and conditions agreed upon to resolve the potential adverse effects of a federal agency program, complex undertaking, or other situation in accordance with 36 CFR Part 800.14(b).

Property type: A grouping of properties defined by common physical and associative attributes used in the evaluation of historic properties.

Protection: The act or process of applying measures designed to affect the physical condition of a property by defending or guarding it from deterioration, loss, or attack, or to cover or shield the property from danger or injury. In the case of buildings and structures, such treatment is generally of a temporary nature and anticipates future historic preservation treatment; in the case of archaeological sites, the protective measure may be temporary or permanent.

Protohistoric: The time of transition between the prehistoric and historic periods, after the advent of written history in a geographic region, but before all groups have entered the historic period.

Provenience: The position of an archaeological find in time and space, recorded three-dimensionally.

Reconnaissance survey: (1) A small-scale archival or field research, designed to provide a general impression of an area's architectural, archaeological, and historic properties and historic property's values, but not designed to produce a level of documentation sufficient to nominate a property to the National Register or determine its eligibility for listing. (2) An examination of all or part of an area accomplished in sufficient detail to make generalizations about the types and distributions of historic properties that may be present.

Reconstruction: The act or process of reproducing by new construction the exact form and detail of a vanished building, structure, or object, or part thereof, as it appeared at a specific period of time.

Record of Decision (ROD): The document filed upon reaching a decision about a project for which an EIS has been prepared. The ROD is issued after the final EIS has been completed and analyzed by the decision-maker.

Rehabilitation: The act or process of returning a property to a state of utility through repair or alteration, which makes possible an efficient contemporary use while preserving those portions or features of the property that are significant to its historical, architectural, and cultural values.

Repair: The act of fixing an element of the resource that has deteriorated or broken.

Repository: A facility such as a museum, archaeological center, laboratory or storage facility managed by a university, college, museum, other educational or scientific institution, a federal, state, or local government agency or Indian tribe that can provide professional, systematic, and accountable curatorial services on a long-term basis.

RELEASED - Printed documents may be obsolete; validate prior to use.

Research design: A statement of proposed identification, documentation, investigation, or other treatment of a historic property that identifies the project's goals, methods, and techniques, expected results, and the relationship of the expected results to other proposed activities or treatments.

Resource type: The general category of property – building, structure, site, district, or object – that may be listed in the National Register.

Restoration: The act or process of accurately recovering the form and details of a property and its setting as it appeared at a particular period of time by means of the removal of later work or by the replacement of missing earlier work.

Rural historic landscape: A geographic area that historically has been shaped or modified by human activity, occupancy, or intervention, and that possesses a significant concentration, linkage, or continuity of areas of land use, vegetation, buildings and structures, roads and waterways, and natural features.

Sacred objects: Items that are specific ceremonial objects needed by traditional Native American religious leaders for the practice of traditional Native American religions by their present-day adherents.

Sacred site: In accordance with EO 13007, "any specific, discrete, narrowly delineated location on federal land that is identified by an Indian tribe, or Indian individual determined to be an appropriately authoritative representative of an Indian religion, as sacred by virtue of its established religious significance to, or ceremonial use by, an Indian religion; provided that the tribe or appropriately authoritative representative of an Indian religion has informed the agency of the existence of such a site."

Secretary's Standards and Guidelines: The Secretary of the Interior's Standards and Guidelines for Archeology and Historic Preservation provide technical information about archaeological and historic preservation activities and methods. The Standards and Guidelines are prepared under the authority of Section 101(f), (g), and (h), and Section 110 of the NHPA.

Section 106: A part of the NHPA, which establishes all federal agencies to consider the effects of their undertakings on historic properties and to provide the ACHP a reasonable opportunity to comment with regard to such action.

Section 110: A part of the NHPA that mandates all federal agencies to identify, evaluate, and nominate historic properties above and beyond the agencies' Section 106 responsibilities. Section 110(a)(1) stipulates that it is the federal agencies' responsibility to preserve and use historic buildings; Section 110(a)(2) states that each federal agency shall establish a preservation program.

Setting: The physical environment of a historic property. One of the seven aspects of integrity required for National Register listing.

Shovel Tests: Excavation units, usually .5 m (1.6 ft) in diameter by a least 1 m (3.3 ft) deep, used to discover buried archaeological sites and also used to sample or probe a site before large-scale excavation.

Significant: A prehistoric or historic district, site, building, structure, or object meeting one or more of the criteria for evaluation used in considering National Register eligibility. Significance is achieved through association with events or important persons, distinctive physical characteristics, or the potential to yield important information. The National Register regulations, 36 CFR Part 60, note that significance is found in properties that have "integrity of location, design, setting, materials, workmanship, feeling, and association."

Site: The location of a significant event, a prehistoric or historic occupation or activity, or a building or structure, whether standing, ruined, or vanished, where the location itself possesses historic, cultural, or archaeological value. Examples include battlefields, campsites, and shipwrecks. Examples of sites at KSC are all Archaeological Sites.

RELEASED - Printed documents may be obsolete; validate prior to use.

Stabilization: The act or process of applying measures designed to reestablish a weather resistant enclosure and the structural stability of an unsafe or deteriorated property while maintaining the essential form as it exists at present.

State Historic Preservation Officer (SHPO): The official appointed or designated pursuant to Section 101(b)(1) of the NHPA to administer the state historic preservation program or a representative designated to act for the SHPO. The SHPO consults with federal and state agencies during Section 106 review, reviews National Register nominations, and maintains file data on cultural resources.

Structure: The term "structure" is used to distinguish from "buildings" those functional constructions made usually for purposes other than creating human shelter. Examples of KSC Structures: LC39A & B and the MLPs.

Test excavation: Excavation of a small portion of an archaeological site to determine the type and extent of the cultural materials present, the degree of site integrity, and the relative site significance.

Test pit: A type of excavation unit dug by shovel at regular intervals or judgmentally. Test pits measure a standard .5 meters (1.6 feet) in diameter by at least 1 meter (3.3 feet) in depth.

Traditional cultural properties: Properties associated with cultural practices or beliefs of a living community. These practices or beliefs must be rooted in that community's history and be important in maintaining the continuing cultural identity of the community.

Treatment: Under Section 106, a measure developed and implemented through Section 106 agreement documents to avoid, minimize, or mitigate adverse effects to historic properties.

Tribal Historic Preservation Officer (THPO): The tribal official appointed by the tribe's chief governing authority or designated by a tribal ordinance or preservation program, who has assumed the responsibilities of the SHPO for purposes of Section 106 compliance on tribal lands in accordance with Section 101(d)(2) of the NHPA.

Undertaking: Under the NHPA, a federal action that is subject to Section 106 review. It is intended to include any project, activity, or program that can result in changes in the character or use of historic properties, if any such historic properties are located in the area of potential effects. The project, activity, or program must be under direct or indirect jurisdiction of a federal agency or licensed or assisted by a federal agency. Undertakings include new and continuing projects, activities, or programs and any of their elements not previously considered under Section 106.

Workmanship: The physical evidence of the crafts of a particular culture or people during any given period in history or prehistory. One of the seven aspects of integrity required for National Register listing.

Zones of Archaeological Potential (ZAP): Areas of differential archaeological site location expectancy (high, medium, and low) relative to environmental factors such as distance to freshwater, soil drainage, and relative elevation.

RELEASED - Printed documents may be obsolete; validate prior to use.

APPENDIX B: Historic Context

RELEASED - Printed documents may be obsolete; validate prior to use.

APPENDIX B-1: Prehistoric (Precontact) Context

1.0 INTRODUCTION

In general, archaeologists summarize the culture history of a given area (i.e., the archaeological region) by outlining the sequence of archaeological cultures through time. Archaeological cultures are defined largely in geographical terms, but also reflect shared environmental and cultural factors. KSC is located within the East and Central Lakes archaeological region, as defined by Milanich and Fairbanks (1980) and Milanich (1994). Geographically, this region included the northern and central portions of the St. Johns River, its tributaries, the adjacent coastal barrier island - salt marsh - lagoon system, and the Central Florida Lake District (Milanich 1994). The sequence of cultural development for the East and Central region was pan-regional during the earliest periods of human occupation. However, after about 500 B.C. distinctive regional cultures had developed and are often distinguished in the archaeological record by differences in ceramic styles and decorations. The Paleo-Indian, Archaic, Formative, Mississippian, and Acculturative stages have been defined based on unique sets of material culture traits such as characteristic stone tool forms and ceramics, as well as subsistence, settlement, and burial patterns. These broad temporal units are further subdivided into culture horizons, phases or periods: Paleo-Indian, Early Archaic, Mount Taylor, Orange, St. Johns I/Malabar I, St. Johns Ia, St. Johns Ib, and St. Johns IIa, IIb, and IIc/Malabar II. A brief summary of these periods is provided in the following sections.

2.0 PALEO-INDIAN

The Paleo-Indian stage is the earliest cultural manifestation in Florida, dating from roughly 11,000 to 8000 B.C. (Austin 2001; Milanich 1994). The majority of Paleo-Indian sites are associated with the rivers in the north-central portion of Florida (Dunbar and Waller 1983). At that time, the climate was cooler and drier. Vegetation was typified by xerophytic species with scrub oak, pine, open grassy prairies, and savannas being the most common (Milanich 1994:40). The sea level was 80 to 130 m (262 to 427 ft) lower than present and the coast extended approximately 161 km (100 mi) seaward on the Gulf coast. This lowering had a direct effect on the water table and it appears that major surface rivers and many seasonal ponds were non-existent in South Florida. Potable water was obtainable at sinkholes where diverse plant and animal life, including precontact period groups, congregated (Milanich and Fairbanks 1980:38-40; Milanich 1994:40).

Thus, the prevailing environmental conditions were largely uninviting to human habitation during the Paleo-Indian period (Griffin 1988:191). Given the inhospitable climate, it is not surprising that the population was sparse with sites of this time uncommon in South Florida. The most readily available information about Florida's earliest inhabitants has been uncovered by underwater excavations at both the Little Salt Spring (Clausen et al. 1979) and Warm Mineral Springs (Clausen et al. 1979; Cockrell and Murphy 1979) sites in Sarasota County. Also, work at the Cutler Fossil Site in Dade County (Carr 1986) has yielded two projectile points, associated with a hearth area, radiocarbon dated to the Paleo-Indian period (ca. 7760 B.C.). In Brevard County, the Helen Blazes Site (8BR27) (Bense and Mattick 1994; Edwards 1954), as well as the Melbourne Golf Course Site (8BR44) and Singleton Site (8BR47) (Rouse 1951) have a reported Paleo-Indian component. There is some evidence that the offshore site, the Douglass Beach Site (8SL17) in St. Lucie County, may date to the Paleo-Indian period (FMSF).

RELEASED - Printed documents may be obsolete; validate prior to use.

In general, the Paleo-Indian period is characterized by small populations, which relied on a hunting and gathering mode of subsistence. The scarce permanent sources of water, or "watering holes" (Neill 1964), were very important in settlement selection (Daniel and Wisenbaker 1987). This settlement model, often referred to as the Oasis Hypothesis (Milanich 1994:41), has a high correlation with geologic features in southern Florida such as deep sinkholes like those noted in Sarasota and Dade Counties. Additionally, fossil beds in the Vero Beach and Melbourne areas have produced human remains in context with Pleistocene fauna (Murphy 1990; Rouse 1951). The geological formation in which these materials are found, the Melbourne Bone Bed, occurs in the area of the Haulover isthmus, and is exposed at both the new and Old Haulover Canals (Brewer 1991). Sites of this period are most readily identified on the basis of distinctive lanceolate-shaped stone projectile points, including those of the Simpson and Suwannee types (Bullen 1975). The tool assemblage also included items manufactured of bone and wood and very likely leather as well as plant fibers (Clausen et al. 1979).

3.0 ARCHAIC

The succeeding Archaic tradition is divided into three temporal periods: the Early Archaic (ca. 7000 to 5000 B.C.), Middle Archaic (ca. 5000 to 2000 B.C.) and the Late Archaic (ca. 2000 to 500 B.C.). During the Early Archaic period, freshwater snails were first exploited in the East and Central region. Since sea levels were lower during the Early Archaic period, many Early Archaic sites are now probably submerged along the Atlantic coast. At approximately 4500 B.C., environmental changes occurred. These had a profound influence upon human settlement and subsistence practices. Among the landscape alterations were rises in sea and water table levels, which resulted in the creation of more available surface water. It was during this time that Lake Okeechobee and the Everglades were created, the St. Johns River took on its present form, and the Caloosahatchee and Peace Rivers flowed with fresh water. In addition to changed hydrological conditions, this period is characterized by the spread of mesic forests and the beginnings of modern vegetation communities, including pine forests and cypress swamps (Widmer 1988; Griffin 1988; Miller 1998).

While the Paleo-Indians depended more heavily upon the Pleistocene megafauna and the relatively limited number of freshwater sources, Archaic populations hunted smaller game and learned to effectively exploit their changing environment. The gradual environmental changes led in part to the extinction of the Pleistocene fauna as well as resulted in the change in composition and distribution of various vegetative communities (Miller 1998).

Early Archaic populations established camps around water resources, which had become larger and more numerous than in the Paleo-Indian period. These groups could sustain larger populations, occupy sites for longer periods, and perform long-term activities (Milanich 1994:67). This change is reflected in the archaeological record with more and larger sites, a greater range of tools, and sites with a significant number of burials.

Milanich (1994:64) notes that there are no well-documented Early Archaic coastal or riverine shell midden sites. This may be due to sea level rise as opposed to avoidance of these areas. Most Early Archaic sites are small campsites. This type of site may suggest that small bands moved periodically in search of food. The Early Archaic tool assemblages are more diverse than the preceding Paleo-Indian tool kits and include specialized stone tools for performing a variety of tasks (Milanich and Fairbanks 1980). Early Archaic sites are recognized by the presence of Greenbriar and Bolen points as well as Kirk, Hardee Beveled, Hamilton, Arredondo, Sumter, and Thonotosassa varieties (Bullen 1975).

RELEASED - Printed documents may be obsolete; validate prior to use.

The Windover Pond Site in Brevard County is an extraordinary Early Archaic burial site, which has provided unprecedented information about the people at this site 7000 to 8000 years ago. Windover Pond is on the edge of the Atlantic Coastal Ridge about 8 km (5 mi) from Cape Canaveral. About 6000 B.C., Early Archaic peoples began visiting the pond, at that time a woody marsh, to bury their dead in the peat deposits. Each body was wrapped in fabric, which was then staked to the soft peat in or on the bottom of the pond, apparently to keep the body submerged. Archaeological excavations recovered 168 bodies, including 91 preserved brains (Doran and Dickel 1988). Each individual was buried within 48 hours after death because brain and other soft tissues were preserved and recovered during archaeological excavations (Milanich 1994:72).

The peat also preserved artifacts and samples of plant and animal remains that were placed with the burials or had inadvertently fallen into the pond. The artifacts include textiles, stone and bone tools, and wooden objects. The pond was used for interments for at least 1000 years, until about 5000 B.C. Archaeological investigations at the Windover Pond Site suggest that for several years a single social group used the pond to bury their dead, placing bodies in one small area of the pond and later, another group, presumably descendants of the previous group, again used the pond for burials (Milanich 1994). After about 5000 B.C., wetter local conditions filled the pond with too much water and made it difficult to inter bodies on the pond bottom, and thus, burials ceased.

During the Middle Archaic, wetter conditions prevailed, sea levels began to rise, and pine forests and swamps began to emerge (Watts et al. 1996). The climate was changed to one of more pronounced seasonality with warmer summers and colder winters; by 4000 B.C., the climate became essentially the same as that of today (Watts et al. 1996:29). Settlement became focused within coastal and riverine locales (Milanich 1994:64). The Mount Taylor period has been identified for the time between roughly 5000-2000 B.C. (Milanich 1994). Subsistence was based on hunting, fishing, shellfish collecting, and plant gathering. Sites are generally located along the Atlantic coast or along the upper reaches of the St. Johns River and the Ocklawaha and Wekiva Rivers. Miller (1998:68) suggests that when sea levels reached their current positions, the St. Johns River changed its riverine characteristics to become similar to a lake in the upper reaches and more estuarine in the lower reaches.

About 4000 B.C., present-day vegetation patterns became established; hammocks of broad-leafed mesic trees, pine forests on uplands, and bayhead and cypress swamps became significant plant communities (Watts 1971). It is believed that populations combined hunting and gathering into a productive subsistence strategy, and as a result, occupation became more sedentary and village life began (Milanich and Fairbanks 1980:147-152). Middens of mystery snail, apple snail, and mussel provide evidence of occupation and resource exploitation along the rivers of east and central Florida.

The type site for this period is the Mount Taylor Site in Volusia County (Moore 1893). The artifact inventory of the Mount Taylor people, as evidenced at the Groves' Orange Midden (8VO2601) and the Lake Monroe Outlet Midden, includes stone projectile points, tools, and microliths, as well as tools and decorative items of shell, bone, and wood (ACI/Janus 2001; Purdy 1994; Wheeler and McGee 1994a, 1994b). Numerous shell and bone items recovered from these sites indicate contact with the coast.
According to Milanich and Fairbanks (1980:151), one of the most interesting aspects of the Mount Taylor culture is evidence for mass burial interments in specially prepared areas within shell middens. The burial mound at Tomoka (8VO51) is one of the earliest in Florida (Piatek 1994). The Tomoka Site (8VO81) consists of nine mounds and a surrounding village midden. Occupants of this site utilized estuarine and coastal resources as evidenced by extensive use of coquina (coast) and oysters (estuary). No ceramics have been recovered from any of the excavations conducted at this site complex (Douglass 1882; Piatek 1992, 1994). The Tick Island Site, located in the St. Johns River basin west of Lake Woodruff, contained 175 burials in a freshwater shell midden. As Milanich describes, "the burial ritual began with the scraping

RELEASED - Printed documents may be obsolete; validate prior to use.

of a shallow depression on top of an existing freshwater shell midden. Bodies, each wrapped in a flexed position, were placed in the depression in a cluster and covered with a mound of sand" (Milanich 1994:82-83). The Gauthier Site is another burial site dating to the Middle to Late Archaic and is located in Brevard County near the coast, about 9.6 km (6 mi) inland from the Atlantic. The Gauthier Site contained approximately 110 individuals, which were interred in shallow depressions in soil, rather than in shell as in Tick Island. The bodies were laid one on top of the other in the depressions (Milanich 1994:83). Artifacts recovered with the burials included limestone throwing-stick weights, projectile points, stone tools, shell beads, bone tools and ornaments, and worked sharks teeth (Milanich 1994:83).

In general, the diagnostic stone tool types of the Middle and Late preceramic Archaic period were large stemmed projectile points, especially the Newnan type. Other common point types include Hillsborough, Levy, Putnam, Alachua, and Marion (Bullen 1975). In addition, silicified coral was more prevalent as a lithic tool raw material (Milanich 1994) and thermal alteration of the stone became more common (Ste. Claire 1987).

Interior sites include the smaller lithic scatter campsites that were most likely used for hunting or served as special use extractive sites for such activities as gathering nuts or other botanical materials (Ste. Claire 1989, 1990). Nut collecting stations would have been used seasonally.

By about 2000 B.C., the firing of clay pottery made its appearance in Florida. The first ceramic types had fibers (Spanish moss or palmetto) as the tempering agents within the clay. These wares are referred to as the Orange series. The Orange period was divided into subperiods based on a variety of ceramic attributes (Bullen 1955, 1972; Milanich 1994). Initially it was thought that the ceramics lacked decoration until about 1650 B.C. Recent research, however, has questioned the entire Orange chronology (Sassaman 2003). Based on a series of accelerator mass spectrometry (AMS) dates on soot from Orange Incised sherds from the middle St. Johns Valley and from radiocarbon dates on oyster and charcoal in association with Orange ceramics near the mouth of the river, all the various Orange ceramic types occur within the time span of roughly 4100-3600 years ago. In addition, research by Cordell (2004) has documented the presence of sponge spicules in the Orange ceramic paste (the diagnostic trait of St. Johns wares), which suggest that the St. Johns ceramic tradition extends back to the beginning of the ceramic technology in the region (Sassaman 2003:11).

Orange settlements were primarily located near wetland locales. The abundance of resources located in and near the wetlands permitted larger settlements. This change in settlement patterns may be related to environmental changes resulting from the establishment of current sea levels. By the end of the Middle Archaic, the climate closely resembled that of today; vegetation changed from those species that preferred moist conditions to pines and mixed forests (Watts and Hansen 1988). The adaptation to this environment allowed for a wider variety of resources to be exploited and greater variability in settlement patterns. Shellfish, fish, and other food sources were now available from coastal and freshwater wetlands resulting in an increase in population size.

Several sites recorded (8BR82A, -86, -87, -88C, -89, -221, -227, and -231), within the CCAFS have Orange period components (Bellamo 1996; Cantley et al. 1994a; Cantley et al. 1994b; Deming and Horvath 1999). Sites within KSC and MINWR include 8BR79, -82, -163, -166, -169, -171, -774, and -1619 (ACI 1990, 1991, 1992a, 1992b, 1996; Griffin and Miller 1978; Long 1967; Smith 1973).

Bridging the close of the Archaic stage and the beginning of the Formative is the Florida Transitional period, circa 1200 to 500 B.C. In general, this time was characterized by increased regionalism, population growth, and socio-cultural complexity (Bullen 1959, 1970). Exploitation of shellfish, fish, and wild plants, as well as a reliance on hunting, was continued and limited horticulture may have been

RELEASED - Printed documents may be obsolete; validate prior to use.

engaged in at this time (Milanich and Fairbanks 1980). The Florida Transitional period is identified by the presence of St. Johns Incised ceramics (Bullen 1955b, 1972; Milanich 1994; Miller 1998). Bullen hypothesized that during the Florida Transitional period, the diffusion of culture traits, resulting from the movements of small groups of people, led to the spread of several ceramic and tool traditions (Bullen 1959). The major changes in post-Transitional cultures cannot be attributed to environmental changes, but rather appear to be the result of social, political, religious, and technological innovations introduced from elsewhere in the eastern United States (Miller 1998:76). A few sites within the CCAFS (BR86, 087, 232) date from this period (Cantley et al. 1994b; Deming and Horvath 1999). In addition, the Zabski Site (Atkins and MacMahan 1967; Bullen 1972) on Merritt Island in Brevard County has been attributed to this period.

4.0 FORMATIVE

The period from about 500 B.C. until A.D. 750 in the East and Central Lakes Region is referred to as St. Johns I/Malabar I, which has been divided into three temporal sub-periods: St. Johns I (500 B.C. – A.D. 100), St. Johns Ia (A.D. 100 – 500), and St. Johns Ib (A.D. 500 – 750) based primarily on characteristic ceramic types (Milanich 1994:247). There are regional variants of this basic cultural tradition: the St. Marys to the north and the Indian River to the south. The St. Marys Region is located at the mouth of the St. Johns and extends northward into Georgia (Russo 1992). Sites in this area contain a mixture of Georgia ceramics as well as St. Johns ceramics.

At the southern end of the East and Central Lakes Region is the Indian River Region, which was first defined by Rouse (1951). There is a much higher prevalence of sand-tempered wares in this region. Malabar I is coeval with St. Johns I. Malabar II occurs at the same time as St. Johns II and both are defined based on the presence of St. Johns Check Stamped pottery. Cordell's ceramic analysis has helped to better define the cultural sequences in this more southern area (Sigler-Eisenberg et al. 1985).

Settlement patterns during this time were virtually the same as that seen for the earlier Mount Taylor and Orange periods, i.e., along the coastal estuaries and larger rivers. However, there was also a tremendous increase in the number of archaeological sites. An apparent trend from St. Johns I through Ib times was a population shift into the northern part of the St. Johns River valley, possibly due to the need for more arable land (Milanich and Fairbanks 1980:158).
Village wares were almost all St. Johns Plain throughout this period. St. Johns Incised is associated with the early St. Johns I period. Deptford and Swift Creek pottery are occasionally present in St. Johns I and Ia subperiods. St. Johns Cordmarked ceramics are associated with the St. Johns Ia period while Dunns Creek Red is associated with the St. Johns Ia and Ib periods. Cordell notes that through time, the St. Johns Plain ceramics become sandier due to increased use of quartz sand as an aplastic agent (Russo et al. 1989:68).

Evidence of the continuous use of burial mounds begins at this time. Many of the burials were found in large central pits, probably the result of secondary interments. Some changes in the burial practices include the possible use of log tombs during the St. Johns Ia period as well as inclusion of Hopewellian-Yent complex exotic trade items (Milanich 1994:261). Much of the information on St. Johns I period burial practices has been obtained from the Ross Hammock Site in Volusia County (Bullen et al. 1967). This site complex consists of two large burial mounds and an extensive village midden located on the west shore of Mosquito Lagoon. Year-round occupation of the coast and along the rivers occurred with special use-activity sites located in other locales and short-term campsites on the coast.

RELEASED - Printed documents may be obsolete; validate prior to use.

5.0 MISSISSIPPIAN/ACCULTURATIVE

The St. Johns II/Malabar II period has also been sub-divided into three sub-periods: St. Johns IIa (A.D. 750 – 1050), St. Johns IIb (A.D. 1050 – 1513), and St. Johns IIc (A.D. 1513 – 1565) (Bense and Mattick 1994; Milanich 1994). The St. Johns II periods are marked by the presence of St. Johns Check-Stamped pottery. "St. Johns II carries on the tradition and is marked only by the introduction of check-stamped pottery" (Goggin 1952:70). Within the Malabar IIb period, in addition to the St. Johns Check-Stamped pottery, we see the addition of Safety Harbor and Fort Walton trade wares from the Gulf Coast and Panhandle of Florida (Bense and Mattick 1994). In addition, Southeastern Ceremonial Complex status and ritual items are occasionally found within the burial mounds. The inclusion of European items into the Malabar material culture is the marker for sites associated with the Malabar IIc period. Occupation of riverine and coastal shell middens continued, although Miller (1998:80) notes that there is a relative increase in the number of non-riverine and non-coastal sites, perhaps as the result of locating sites in more agriculturally suited locales.

Milanich and Fairbanks (1980) suggest that hunting and gathering remained important, but the dependence upon cultivated crops such as maize, squash, and gourds increased. The use of gourds as domesticates is still being studied as there is no evidence for cultivation even though gourds and squashes have been around for thousands of years prior to this period (Newsom et al. 1993). Sigler-Eisenberg and her colleagues (1985) suggest that in the upper St. Johns Basin, the practice of horticulture was not adopted. Russo (1984) and Sigler-Eisenberg (1984) further indicate that the wetland ecology and subsistence strategies were different.

There was an increase in the number and size of villages during the St. Johns IIa period suggesting population expansion. A ranked society evolved as evidenced by the differential burial customs. No longer were all people interred in burial mounds. Deagan (1978:109) notes that around A.D. 1000, a population shift from the more southern and southwestern areas into the northern areas is evidenced by changes in relative frequencies of burial mounds in the areas over time.

The St. Johns IIb period is characterized by the adoption of some Mississippian traits into the ceremonial system as well as the presence of St. Johns Simple Stamped ceramics. The Mississippian lifestyle, however, never became dominant, possibly because the soils were not suitable for full agricultural pursuits. A more complex socio-political organization is suggested by the presence of platform mounds at the ceremonial centers including the Shields Mound, Mount Royal, and the Thursby Mound (Ashley 2005a, 2005b; Moore 1894a, 1894b).

The St. Johns IIc period is marked by the introduction of European artifacts in some of the mounds. The historic aboriginal occupants of the region were the Timucua, Mayaca, and the Ais. The Timucuans shared a common language, but cannot be considered as a specific cultural group, because the range of the Timucuan speakers "... was crosscut by dialect, techno-environmental, ceremonial, political and geographical differences" (Deagan 1978:89). The project area lies within the extreme northern section of the Ais territory (Hann 2003; Milanich 1995). Although these Indians apparently continued the St. Johns tradition, they did not share the same Timucuan language as many of the other St. Johns historic counterparts (Milanich 1995).

The arrival of the Europeans in the 1500s began a period of extensive social and cultural upheaval. Many of the traditional ways of life were destroyed or abandoned. Warfare and European diseases brought an end to the aboriginal inhabitants and their cultures. Due to the attempts of the Spanish military and missionaries to alter the traditional lifeways, by the end of the 17th century these aboriginal populations were virtually extinct. Raids in the early 18th century by Indian groups allied with the English drove

RELEASED - Printed documents may be obsolete; validate prior to use.

many of the Mayaca and Timucuans to seek refuge near St. Augustine where most perished in warfare or because of epidemics (Hann 1993:133; Milanich 1995). By the first half of the 18th century, the native populations had all but vanished (Neill 1968) and groups of Creek Indians, who came to be known as Seminoles, moved into Florida. What few Timucua survived were transported to Cuba with the Spaniards of St. Augustine when Spain surrendered to Britain (Hann 1993:324).

RELEASED - Printed documents may be obsolete; validate prior to use.

REFERENCES CITED

Archaeological Consultants, Inc. (ACI). Archaeological Survey to Establish Zones of Archaeological Potential (ZAPs) in the VAB and Industrial Areas of Kennedy Space Center. Sarasota, Florida: ACI. 1990.

ACI. Archaeological Survey to Establish Zones of Archaeological Potential (ZAPs) in the Launch Complex Area (Option 1) of the Kennedy Space Center. Sarasota, Florida: ACI. 1991.

ACI. Archaeological Survey to Establish Zones of Archaeological Potential (ZAPs) in the Shuttle Landing and KSC South Area (Option 2) of the Kennedy Space Center. Sarasota, Florida: ACI. 1992a.

ACI. Archaeological Survey to Establish Zones of Archaeological Potential (ZAPs) in the KSC North Area (Option 3) of the Kennedy Space Center. Sarasota, Florida: ACI. 1992b.

ACI. Archaeological Survey to Establish Zones of Archaeological Potential in the KSC North Area (East of State Road 3) (Basic Contract Area) of the Kennedy Space Center. Sarasota, Florida: ACI. 1996.

ACI/Janus Research, Inc. (ACI/Janus). Phase III Mitigative Excavation at the Lake Monroe Outlet Midden (8VO53), Volusia County, Florida. Sarasota, Florida: ACI. 2001.

Ashley, Keith H. "Archaeological Overview of Mt. Royal." *The Florida Anthropologist* 58(3-4): 265-286. 2005a.

Ashley, Keith H. "Introducing Shields Mound (8DU12) and the Mill Cove Complex." *The Florida Anthropologist* 58(3-4): 151-173. 2005b.

Atkins, Steve and Jeannie MacMahan. "The Zabski Site, Merritt Island, Florida." *The Florida Anthropologist* 20(3-4): 133-145. 1967.

Austin, Robert J. Paleoindian and Archaic Archaeology in the Middle Hillsborough River Basin: A Synthetic Overview. Jonesville, Florida: SEARCH. 2001.

Bellamo, Randy V. Archaeological Investigations within Florida Power & Light Company's 115-kV Transmission Line Right-of-Way, Cape Canaveral Air Force Station, Brevard County, Florida., St. Petersburg, Florida: Janus Research. 1996.

Bense, Judith A. and Barbara A. Mattick. Archaeological Resources in the Upper St. Johns River Valley, Florida. NRHP Multiple Property Nomination Form. 1994.

Brewer, David M. An Archaeological and Ethnohistorical Overview and Assessment of Mosquito Lagoon at Canaveral National Seashore, Florida. M.A. Thesis, Department of Anthropology, Florida State University, Tallahassee. 1991.

Bullen, Ripley P. "Carved Owl Totem, Deland, Florida." *The Florida Anthropologist* 8(3): 61-73. 1955a.

Bullen, Ripley P. "Stratigraphic Tests at Bluffton, Volusia County, Florida." *The Florida Anthropologist* 8(1): 1-16. 1955b.

RELEASED - Printed documents may be obsolete; validate prior to use.

Bullen, Ripley P. "The Transitional Period of Florida." *Southeastern Archaeological Conference Newsletter* 6(1): 43-53. 1959.

Bullen, Ripley P. "The Transitional Period of Southern Southeastern United States as Viewed from Florida, or the Roots of the Gulf Tradition." *Southeastern Archaeological Conference Bulletin* 13: 63-70. 1970.

Bullen, Ripley P. "The Orange Period of Peninsular Florida." In *Fiber-Tempered Pottery in Southeastern United States and Northern Columbia: Its Origins, Context, and Significance*. Edited by R. P. Bullen and J. B. Stoltman, pp. 9-33. *Florida Anthropological Society Publications* 6. 1972.

Bullen, Ripley P. *A Guide to the Identification of Florida Projectile Points*. Gainesville, Florida: Kendall Books. 1975.

Bullen, Ripley P., Adelaide K. Bullen, and William J. Bryant. "Archaeological Investigations at Ross Hammock Site, Florida." *American Studies Report* 7. Orlando, Florida: The William L. Bryant Foundation. 1967.

Cantley, Charles E., Mary Beth Reed, Dean Foster, and Leslie Raymer. Identification of the Limits of a Burial Component at Site 8BR86, Cape Canaveral Air Force Station, Brevard County, Florida. *Technical Report* 222. Stone Mountain, Georgia: New South Associates. 1994a.

Cantley, Charles E., Mary Beth Reed, Leslie Raymer, and Joe Joseph. Historic Properties Survey, Cape Canaveral Air Force Station, Brevard County, Florida. *Technical Report* 183. Stone Mountain, Georgia: New South Associates. 1994b.

Carr, Robert S. *Preliminary Report of Archaeological Excavations at the Cutler Fossil Site in Southern Florida*. Paper presented at the 51st Annual Meeting of the Society for American Archaeology, New Orleans, LA. 1986.

Clausen, Carl J., A. D. Cohen, Cesare Emiliani, J. A. Holman, and J. J. Stipp. "Little Salt Spring, Florida: A Unique Underwater Site." *Science* 203(4381): 609-614. 1979.

Cockrell, W. A. and Larry E. Murphy. "Pleistocene Man in Florida." *Archaeology of Eastern North America* 6: 1-13. 1978.

Cordell, Ann S. "Paste Variability and Possible Manufacturing Origins of Late Archaic Fiber-Tempered Pottery from Selected Sites in Peninsular Florida." In *Early Pottery: Technology, Function, Style, and Interaction in the Lower Southeast*. Edited by R. Saunders and C. T. Hays, pp. 63-104. Tuscaloosa, Alabama: University of Alabama Press. 2004.

Daniel, I. Randolph and Michael Wisenbaker. *Harney Flats: A Florida Paleo-Indian Site*. Farmingdale, NY: Baywood Publishing Co., Inc. 1987.

Deagan, Kathleen A. "Cultures in Transition: Assimilation and Fusion Among the Eastern Timucua." In *Tacachale: Essays on the Indians of Florida and Southeastern Georgia During the Historic Period*. Edited by J. T. Milanich and S. Proctor, pp. 89-119. Gainesville, Florida: University Press of Florida. 1978.

RELEASED - Printed documents may be obsolete; validate prior to use.

Deming, Joan and Elizabeth A. Horvath. Phase II Test Excavation Report: Sixteen Archaeological Sites, Cape Canaveral Air Station, Brevard County. Sarasota, Florida: ACI. 1999.

Doran, Glen H., Ed. *Windover: Multidisciplinary Investigations of an Early Archaic Florida Cemetery*. Gainesville, Florida: University Press of Florida. 2002.

Doran, Glen H. and David N. Dickel. "Multidisciplinary Investigations at the Windover Site. In *Wet Site Archaeology*, Edited by Barbara A. Purdy, pp. 263-289. The Telford Press, Caldwell, N.J., 1988.

Douglass, Andrew E. "A Find of Ceremonial Axes in a Florida Mound." *American Antiquarian and Oriental Journal* 4: 100-109. 1882.

Dunbar, James S. and Ben I. Waller. "A Distribution Analysis of the Clovis/Suwannee Paleo-Indian Sites of Florida - A Geographical Approach." *The Florida Anthropologist* 36(1-2): 18-30. 1983.

Edwards, W. E. The Helen Blazes Site of Central Eastern Florida: a Study in Methods Utilizing the Disciplines of Archaeology, Geology, and Pedology. Ph.D. dissertation, Department of Political Science, Columbia University. 1954.

Florida Master Site File (FMSF). Various site file forms. On file, Florida Division of Historical Resources, Tallahassee.

Goggin, John M. Space and Time Perspective in Northern St. Johns Archaeology, Florida. *Yale University Publications in Anthropology* 47. 1998 Reprint, Gainesville, Florida: University Press of Florida. 1952.

Griffin, John W. *The Archeology of Everglades National Park: A Synthesis*. National Park Service, Southeastern Archaeological Research Center, Tallahassee. 1988.

Griffin, John W. and James J. Miller. Cultural Resource Reconnaissance of Merritt Island National Wildlife Refuge. Tallahassee, Florida: Cultural Resource Management, Inc. 1978.

Hann, John H. *A History of the Timucua Indians and Missions*. Gainesville, Florida: University of Press of Florida. 1993.

Hann, John H. *Indians of Central and South Florida 1513-1763*. University Press of Florida, 2003.

Long, George A. Indian and Historic Sites Report, John F. Kennedy Space Center, NASA. 1967.

Milanich, Jerald T. *Archaeology of Precolumbian Florida*. Gainesville, Florida: University Press of Florida. 1994.

Milanich, Jerald T. *Florida Indians and the Invasion from Europe*. Gainesville, Florida: University Press of Florida. 1995.

Milanich, Jerald T. and Charles H. Fairbanks. *Florida Archaeology*. New York: Academic Press. 1980.

Miller, James J. *An Environmental History of Northeast Florida*. Gainesville, Florida: University Press of Florida. 1998.

RELEASED - Printed documents may be obsolete; validate prior to use.

Moore, Clarence B. Certain Shell Heaps of the St. Johns River, Florida, Hitherto Unexplored (Second Paper). *The American Naturalist* 27:8-13, 113-117. In *The East Florida Expeditions of Clarence Bloomfield Moore*, Edited by J. M. Mitchem. Tuscaloosa, Alabama: University of Alabama Press. 1893.

Moore, Clarence B. Certain Sand Mounds of the St. Johns River, Florida, Part I. *Journal of the Academy of Natural Sciences of Philadelphia* 10:5-128. In *The East Florida Expeditions of Clarence Bloomfield Moore*, Edited by J. M. Mitchem. Tuscaloosa, Alabama: University of Alabama Press. 1894a.

Moore, Clarence B. Certain Sand Mounds of the St. Johns River, Florida, Part II. *Journal of the Academy of Natural Sciences of Philadelphia* 10:129-246. In *The East Florida Expeditions of Clarence Bloomfield Moore*, Edited by J. M. Mitchem. Tuscaloosa, Alabama: University of Alabama Press. 1894b.

Murphy, Larry E. "8SL17: Natural Site Formation Processes of a Multiple Component Underwater Site in Florida." *Professional Papers* 39. Southwest Cultural Resources Center, Santa Fe, NM. 1990.

Neill, Wilfred T. "The Association of Suwannee Points and Extinct Animals in Florida." *The Florida Anthropologist* 17(3-4): 17-32. 1964.

Newsom, Lee A., S. David Webb, and James S. Dunbar. "History and Geographical Distribution of *Cucurbita pepo* Gourds in Florida." *Journal of Ethnobiology* 13(1):75-98. 1993.

Piatek, Bruce J. "Tomoka State Park Survey and Preliminary Test Excavation Results." *The Florida Anthropologist* 45(4): 326-335. 1992.

Piatek, Bruce J. "The Tomoka Mound Complex in Northeast Florida." *Southeastern Archaeology* 13(2): 109-118. 1994.

Purdy, Barbara A. "The Chipped Stone Tool Industry at Grove's Orange Midden (8VO2601), Volusia County, Florida." *The Florida Anthropologist* 47(4): 390-392. 1994.

Rouse, Irving. A Survey of Indian River Archaeology, Florida. *Yale University Publications in Anthropology* 44. New Haven, Connecticut: Yale University Press, New Haven. 1951.

Russo, Michael. *The Evolution of Subsistence Strategies of Faunal Resources at the Gauthier Site*. Paper presented at the 41st Southeastern Archaeological Conference, Pensacola. 1984.

Russo, Michael. "Chronologies and Cultures of the St. Marys Region of Northeast Florida and Southeast Georgia." *The Florida Anthropologist* 45(2): 107-138. 1992.

Russo, Michael, Ann S. Cordell, Lee A. Newsom, and Robert J. Austin. Phase III Archaeological Excavations at Edgewater Landing, Volusia County, Florida. Janus Research, Tampa. 1989.

Sassaman, Kenneth E. "New AMS Dates on Orange Fiber-Tempered Pottery from the Middle St. Johns Valley and Their Implications for Culture History in Northeast Florida." *The Florida Anthropologist* 56(1): 5-13. 2003.

RELEASED - Printed documents may be obsolete; validate prior to use.

Sigler-Eisenberg, Brenda. *Foraging Strategies in a Malabar I Period Household*. Paper presented at the 41st Annual Southeastern Archaeological Conference, Pensacola. 1984.

Sigler-Eisenberg, Brenda, Ann S. Cordell, Richard W. Estabrook, Elizabeth A. Horvath, Lee A. Newsom, and Michael Russo. "Archaeological Site Types, Distribution, and Preservation within the Upper St. Johns River Basin." *Miscellaneous Project and Report Series* 27. Department of Anthropology, Florida Museum of Natural History, Gainesville. 1985.

Smith, Richard L. Archaeological Survey Report: NASA Space Shuttle Runway Project on Merritt Island, Florida. *Miscellaneous Project Report Series* 3. Tallahassee, Florida: Florida Division of Historical Resources. 1973.

Ste. Claire, Dana. "The Development of Thermal Alteration Technologies in Florida: Implications for the Study of Prehistoric Adaptation." *The Florida Anthropologist* 40(3): 203-208. 1987.

Ste. Claire, Dana. Archaeological Investigations at the McDonald Farm Site, Volusia County, Florida. Manuscript on file, Florida Division of Historical Resources, Tallahassee. 1989.

Ste. Claire, Dana. "The Archaic in East Florida: Archaeological Evidence for Early Coastal Adaptations."*The Florida Anthropologist* 43(3): 188-197. 1990.

Watts, William A. "Post Glacial and Interglacial Vegetational History of Southern Georgia and Central Florida." *Ecology* 51: 676-690. 1971.

Watts, William A., Eric C. Grimm, and T. C. Hussey. "Mid-Holocene Forest History of Florida and the Coastal Plain of Georgia and South Carolina." In *Archaeology of the Mid-Holocene Southeast*. Edited by K. E. Sassaman and D. G. Anderson, pp. 28-38. Gainesville, Florida: University Press of Florida. 1996.

Watts, William A. and Barbara C. S. Hansen. "Environments in Florida in the Late Wisconsin and Holocene." In *Wet Site Archaeology*. Edited by B. A. Purdy, pp. 307-323. Caldwell, N.J.: Telford Press. 1988.

Wheeler, Ryan J. and Ray M. McGee. "Technology of Mount Taylor Period Occupation, Groves' Orange Midden (8VO2601), Volusia County, Florida." *The Florida Anthropologist* 47(4): 350-379. 1994a.

Wheeler, Ryan J. and Ray M. McGee. "Wooden Artifacts from Groves' Orange Midden." *The Florida Anthropologist* 47(4): 380-389. 1994b.

Widmer, Randolph J. *The Evolution of the Calusa*. Tuscaloosa, Alabama: University of Alabama Press. 1988.

RELEASED - Printed documents may be obsolete; validate prior to use.

APPENDIX B-2: Historic Context

1.0 FIRST SPANISH PERIOD

The cultural traditions of the native Floridians ended with the advent of European expeditions to the New World. The initial events, authorized by the Spanish Crown in the 1500s, ushered in devastating European contact. On Ponce de Leon's first voyage to "La Florida," his initial landing site has long been suspected as north and in the general vicinity of Cape Canaveral (Milanich 1995:108). It is likely that he anchored offshore one of the Native American villages in the territory of the Ais, the Native American group living in the area at the time of European contact (Rouse 1951:48). After Ponce de Leon's journey in 1513, Spanish explorations were confined to the West Coast of Florida (Narvaez in 1528; DeSoto in 1539) and European contact along the East Coast was left to a few shipwrecked sailors from treasure ships, which by 1551, sailed through the Straits of Florida on their way to Spain. This changed when the French established a colony near the mouth of the St. Johns River. The Spanish, viewing this as an intrusion into Spanish Florida, responded by sending Pedro Menéndez de Avilés, commissioned Adelantado, or royal governor, of Spanish Florida to head off the relief fleet of Ribault and remove the French from Florida.

In an attempt to attack the newly established colony in St. Augustine, Ribault assembled his ships and most of his soldiers for battle and headed southward. Near the Cape Canaveral area, a landmark known to early explorers and sailors, they were forced ashore. Here they constructed a fort, a "rough earthwork surmounted by six bronze cannon from the Trinité," and began building a boat (Lyon 1976:128). Indians, friendly to the Spanish, related this information to Menendez, who captured all but one French captain and a few soldiers who decided to risk their fortunes with the Indians rather than the Spanish Catholics. The location of the French fort may be the Oyster Bay Site (8VO3128), located less than .8 km (.5 mi) north of the KSC property boundary. Here, European artifacts in various stages of re-manufacture and showing evidence of technology beyond protohistoric Native Americans have been recovered. Sixteenth century artifacts, similar to those recovered from the Oyster Bay Site have also been recovered from the Pistol Point Site (8VO3129) (Brewer and Horvath 2004), located approximately .8 km (.5 mi) south of the northern KSC boundary.

After burning the French fort, destroying the boat, and burying the cannons, Menendez proceeded southward (Lyon 1976), passing a number of villages from which the Indian inhabitants had fled. He left mirrors, knives, scissors, and bells as a sign of good will and received hospitality and food in return from the Ais who lived near the Indian River inlet (Barcia 1923:91 in Rouse 1951). Menendez remained four days, arranging for 200 of his men under Juan Velez de Medrano to settle nearby while he continued to Havana for supplies and to turn over the French prisoners. However, upon his departure, the Ais attacked the soldiers and Medrano moved the survivors to the southern end of the Indian River where the more friendly Guacata Indians, and a better supply of food, could be found. He named the new settlement Santa Lucia, or St. Lucie (Barrientos 1902:96-97 in Rouse 1951; Menendez 1893:111 in Rouse 1951).

During Spain's first period of occupancy (1565-1763), no permanent settlements were established within what today are the KSC property boundaries. Located on the fringe of Spanish activity centered in St. Augustine, Indian River was too far removed for Spain to exert political control (Milanich and Fairbanks 1980). While a system of Catholic missions along the Atlantic coast and in the interior of Florida had been established in the early years, many of the inhabitants were frequently relocated and consolidated often moving to areas around St. Augustine. A large number of land grants were issued to Spanish citizens although often these were not occupied. Spanish cattle ranches were present in La Florida, the largest situated in present-day Alachua County, and citrus groves in the vicinity of St. Augustine produced some exports, as did the naval stores industry. St. Augustine, though, was primarily a military outpost, supported by the Spanish government (HSAPB 1985).

RELEASED - Printed documents may be obsolete; validate prior to use.

From the 1570s into the 1700s, there are references to Spanish contact with the Ais (Rouse 1951:50-56). Most accounts describe the encounters as hostile, but others are described as hospitable (Rouse 1951:53-53). Alvaro Mexia, a young soldier, visited and described the area in 1605 while on a diplomatic mission. His first-hand observation and accompanying map of the area from St. Augustine to south of Cape Canaveral provide detail about the environment and Native American villages (Higgs in Rouse 1951:265-274). Included is the town of Surruque (near Ross Hammock), Surruque Mound (Mt. Tucker or Turtle Mound), Lake or Lagoon Surruque (Mosquito Lagoon), Urruya (area of Haulover Canal), and the Lagoon of Savovoche (Banana River). However, the most important description of the Ais in the 17th century was recorded by Jonathan Dickinson who, with his family and other members of his party, was shipwrecked in September 1696 while en route from Port Royal, Jamaica, to Philadelphia. The group walked from the coast of the Jeaga territory, thought to be located to the south of the Ais, northward to St. Augustine. Although the party spent only a brief time among the Indians, Dickinson left a vivid account of Ais appearance, dress, subsistence, ceremonies, and other customs (Andrews and Andrews 1975).

After the establishment of St. Augustine, Native American groups living in the general area of the Cape sometimes exchanged shipwrecked or captured individuals to the Spanish in exchange for manufactured goods such as beads, cloth, and metal tools (Lyon 1995 in Parker 2002). Such items, including a European silver pendant with a Native American design, have been found in archaeological sites in the Indian River area (8BR90, Fuller Mound; 8BR85, Burns Mound). It is likely that the Ais population sharply declined during the 17th century. The number of villages mentioned by Mexia and the number mentioned by Dickinson are in contrast; even though they traveled through the same areas some 90 years apart.

2.0 BRITISH PERIOD

By the early 1700s, the native populations were largely gone - ravaged by conquest, disease, and the typical effects of European contact. The area that now constitutes the State of Florida was ceded to England in 1763 after two centuries of Spanish possession. Britain divided its possession into two parts, East and West Florida with seats of government in each part. St. Augustine was the capital of East Florida. Soon after taking possession of Florida, the governor of East Florida, Col. James Grant, announced that a road (Old King's Road) would be built from Georgia, through Jacksonville, St. Augustine, and Flagler County, to New Smyrna (Clegg 1976; HPA 1987). A section was also built from New Smyrna southward ". . . on to Eliot's plantation at Stobbs" (Schafer 2001:164). Constructed between 1770 and 1774, the King's Road linked the British colonies of the Carolinas and Georgia with East Florida.

England, and the governor of East Florida, Col. James Grant, desired to populate Florida lands quickly and implemented a system of land grants. Many entrepreneurs took advantage of this and promised to import labor for the plantations that they envisioned on their lands. One of the largest and well-known is New Smyrna, located to the north of KSC. Over 1250 Minorcans, Corsicans, Italians, and Greeks, indentured to Dr. Andrew Turnbull and his British partners, arrived in 1768. The New Smyrna Colony was one of the most ambitious agricultural enterprises undertaken during the British occupation of East Florida. Despite the construction of numerous houses, workshops, storehouses, a church, wharves, and canals, the settlement was not prosperous. In 1777, the New Smyrna colonists moved en masse to St. Augustine.

The documentation for the plantations south of New Smyrna was, until recently, limited. Recent research conducted by Schafer and others has provided a more complete picture of the British era plantations in Florida, and especially in this region of the state. A 1769 coastal map of East Florida, based on William Gerard de Brahm's work, shows the "carrying place" (the haulover) and "Cape Round Creek" on Merritt

RELEASED - Printed documents may be obsolete; validate prior to use.

Island. The areas of Merritt Island near the water are described as "water mangrove swamp" or "saltwater mangrove swamp" and the southern portion are shown as "pine." No structures or grant lands are shown (Lewis and Lewis 1769). The de Brahm map (1769) shows the 10,000-acre Thomas Bradshaw grant on the west side of Indian River across from the Haulover and the 20,000-acre William Faucitt grant at the head of Indian River. Both Bradshaw and Faucitt are listed as inhabitants of East Florida (Griffin and Miller 1978).

An undated map indicates that a grant at the head of the Indian River on or near the Faucitt grant was made to William Elliot and a grant to the north of this property was made to Captain Robert Bissett (Griffin and Miller 1978). Bissett's plantation is believed to be located north of Oak Hill and Elliot's on the KSC property in the area known as Ross' Hammock. This area also appears on maps as the Creyon and Gomez grants of the Second Spanish Period (Griffin and Miller 1978). Both Bissett and Elliot developed plantations, and in Bissett's claim to the Crown, after the retrocession of Florida to Spain, he notes the presence of "Mr. Elliot's Plantation" a few miles to the south. Here, sugar was planted "with tolerable success" (Griffin and Miller 1978; Siebert 1929). Additional information about Elliot's Plantation is known through correspondence from Grant (Schafer 2001:164), Turnbull (1769, 1774, 1778), Laurens (1773), and Moultrie (1773) where it was noted that Elliot was experimenting with and producing sugar cane and indigo (Schafer 2008). During the year 1774, according to correspondence of the time, between 60 and 70 acres of cane had been planted (Moore 2008b; Schafer 2008). Plantation maps indicate several "negro houses" and other structures present on the 12,000-acre Elliott grant (Moore 2008b). Evidently, unlike others, Elliot did not petition the Crown for his claim at the end of British occupation, as no records have been found (Griffin and Miller 1978).

The names "Ross' Plantation" or "Ross' Old Place," are frequently found in the documentation of the time and refer to the Elliot Plantation. Additionally, the term "Stobbs" is found in several references and likely refers to the plantation's name (Schafer in Moore 2008b; Schafer 2001:101, 164, 165). John Ross worked as an agent for Elliot, arriving in East Florida probably in late 1767 aboard the "Aurora" (Moore 2008b). His name is mentioned in several pieces of correspondence of the time including Laurens (1773), Mulcaster (1772), Turnbull (1769) and in Romans (1775) (Schafer 2008). Additionally, it is believed that Michaux (1788) was referring to Ross' Plantation (Elliot's Plantation) when he mentioned "I crossed the swamp which once formed this habitation on which sugar cane had been cultivated and finally towards midday, we came to the Indian River" (Taylor and Norman 2002:54). It has been suggested that "Roger" may be a misprint for "Ross" (Griffin and Miller 1978; Taylor and Norman 2002). According to Griffin and Miller (1978) the inconsistencies among the maps and the documentary information make it difficult to distinguish the amount of local British plantation activity, although new and ongoing research is adding to the general knowledge of the area. In general, the British adaptation produced greater exports than the Spanish, although the majority of the plantations had failed by the time the land was returned to Spain (Griffin and Miller 1978:145).

Recent archaeological investigation of the Elliot Plantation Site, including the complex at Ross Hammock (8VO2569) and the "sugar mill ruins" (8VO160), determined that all sites date to the 1773-1783 East Florida British Period (Schwadron 2008b). At Ross Hammock, the previously interpreted Confederate Salt Works (8VO213) is "likely the ruins of one of Jon Ross' first settlement, dating to around 1763" (Schwadron 2008b). The structure may have been the overseer's main house. In the Ross Hammock site area a potential slave village area with artifacts suggestive of an 18th century domestic occupation was found. Investigation of the Sugar Mill Ruins Site (8VO160) revealed structures and associated artifacts dating to 1750s-1780s. Also discovered at this location was another component, the Elliot Slave Village (Schwadron 2008b).

RELEASED - Printed documents may be obsolete; validate prior to use.

3.0 SECOND SPANISH PERIOD

England governed Florida until 1783 when the Treaty of Paris returned Florida to Spain; however, Spanish influence was nominal during this second period and land ownership was open to non-Spanish people under certain stipulations. Many of the large plantations were divided into smaller land grants. Early in the period, the governor was authorized to grant land on the condition of settlement or improvement, but a second royal order allowed the granting of land as a concession for military service. Once it was recognized that the region was eventually to become an American Territory, many grants were made for the primary purpose of ensuring property rights that would be honored by the next government (Tebeau 1980:103). The earliest was an 1801 grant to Lewis Mattair for 300 acres in the vicinity of the English settlement called Ross' Plantation. An 1809 plat showed cleared land, an orange grove, a dock, and a canal. Mattair raised cotton and corn and possessed slaves. In 1822, Mattair sold the grant to Antelm Gay (Griffin and Miller 1978).

In 1803, John H. McIntosh obtained a land grant from the Spanish Crown for today's Merritt Island. In his memorial written to claim the land, McIntosh wrote that he was prepared to move his family and 250 slaves to the island. However, his move was never made and instead a man named Merritt was apparently sent by McIntosh to look after the property. Merritt made improvements to the land by planting citrus. The name "Marratt's Island" appears on an 1817 plat and the name Merritt's Island appears on the Tanner map of 1823 (Olausen 1991:3).

In 1804, land was granted to Francisco Reyes. Whether Reyes actually occupied the land is unknown, although unlikely since Reyes served in the militia from March of 1812 to January of 1813. Additionally, few plantations in the region were occupied during this period due to the East Florida Rebellion. In May of 1817, Reyes petitioned for title to the land and it was granted. Florida's Second Spanish Period ended in 1819, when Florida became a territory of the United States. Reyes' land was later sold to Lucas Creyon in 1821 for 1000 pesos (Griffin and Miller 1978).

4.0 TERRITORIAL PERIOD AND EARLY STATEHOOD

Prior to the American colonial settlement of Florida, portions of the Creek Nation and remnants of other Indian groups from Alabama, Georgia, and South Carolina moved into Florida and began to repopulate the vacuum created by the dissemination of the aboriginal inhabitants. The Seminoles, as these migrating groups of Indians became known, formed, at various times, loose confederacies for mutual protection against the new American Nation to the north (Tebeau 1971:72). Adair (1930:489 in Rouse 1951:58) records a band of Creek Indians on a raid into South Florida, who traveled up the St. Johns River to its headwaters and portaged through Ais territory to the Indian River.

The bloody conflict between the Americans and the Seminoles over Florida first came to a head in 1818 and was subsequently known as the First Seminole War. As a result of the war and the Adams-Onis Treaty of 1819, Florida became a United States Territory in 1821. Andrew Jackson, named provisional governor, divided the territory into St. Johns and Escambia Counties. At that time, St. Johns County encompassed all of Florida lying east of the Suwannee River, and Escambia County included the land lying to the west. In the first territorial census in 1825, some 5,077 persons reportedly lived east of the Suwannee River; by 1830 that number had risen to 8,956 (Tebeau 1971:134).

Even though the First Seminole War was fought in north Florida, the Treaty of Moultrie Creek in 1823, at the end of the War, was to affect the settlement of all Florida. The Seminoles relinquished their claim to the whole peninsula in return for occupancy of approximately four million acres of reservation south of Ocala and north of Charlotte Harbor (Mahon 1967:46-50). The treaty never satisfied the Indians or

RELEASED - Printed documents may be obsolete; validate prior to use.

whites. The inadequacy of the reservation and the desperate situation of the Seminoles living there, plus the mounting demand of the whites for their removal, soon produced another conflict.

By 1835, the Second Seminole War was underway. Mosquito County, which encompassed present-day Brevard County, was sparsely occupied with mostly sugar plantations along the rivers near the coast. Seminoles ransacked or burned 16 of these plantations on the northern Mosquito Lagoon by January 1836 (Eriksen 1994:36). The Commanding General, Thomas Jesup, launched a plan to surround the Seminoles within the Everglades. From northern Mosquito County he ordered four main columns to form a staggered front to begin marching south (Eriksen 1994:36). Fort Ann, Fort Pierce, Fort Taylor, Fort Christmas, and Fort Bassinger were a few of the forts established during this period on the eastern side of the peninsula.

Fort Ann was constructed at the haulover, on the Indian River side of the crossing, within Township 20 South, Range 36 East. The intent was to erect a fortified depot that would serve as a place to supply troops continuing down the Indian River. Construction of the fort was completed between December 26 and December 30, 1837. At the time, approximately 900 troops were situated at the haulover, likely living in tents readying to embark on a major military offensive against the Seminoles. While two first-hand reports of life at the fort exist, they give little detail about the fort construction techniques. It is not until 1880, when J. Francis LeBaron surveyed the area that a sketch of the fort appears in the documentation (Paterno 2003). By this time, the Haulover Canal, located to the north of the Old Haulover, had been completed (HPA 1987). The presence of bastions, glacis, ditch, and terraplein are shown on the map (Figure 9-1). There are no documented accounts of Fort Ann under attack, nor any for Fort Hernandez which existed on the western side of the Indian River. However, there are accounts of troops returning to Fort Ann several times to obtain provisions (Paterno 2003). The fort was abandoned in 1838 by the Army, but accounts of its use during the Civil War as a Union camp (Kjerulff 1972; Paterno 2003) and as a station for the U.S. Schooner Beauregard to prevent trafficking along the inland waterway exist (Department of the Navy 1971 in Parker 2002). In 1880, LeBaron described the Haulover Canal as 20 feet wide (State of Florida 1880:185) and provides a sketch of the canal in his field notes (State of Florida 1880:217). Additionally, LeBaron describes a Fort Ann parapet as being 3 to 4 feet high and a ditch about 8 feet wide on the north side of the fort (State of Florida 1880:185). He also described a 12 by 20 foot, one story house, an orange grove, and a “small agreeable garden” around the house within the fort walls. The house was owned by W.E. Futch (Paterno 2003; State of Florida 1880:199). In his notes, LeBaron credits the assistance of Daniel L. Futch (“chainman”), Leonard Griffis (“chainman”), and Shelby Revels (“axeman and moundman”) (State of Florida 1880:175).

RELEASED - Printed documents may be obsolete; validate prior to use.

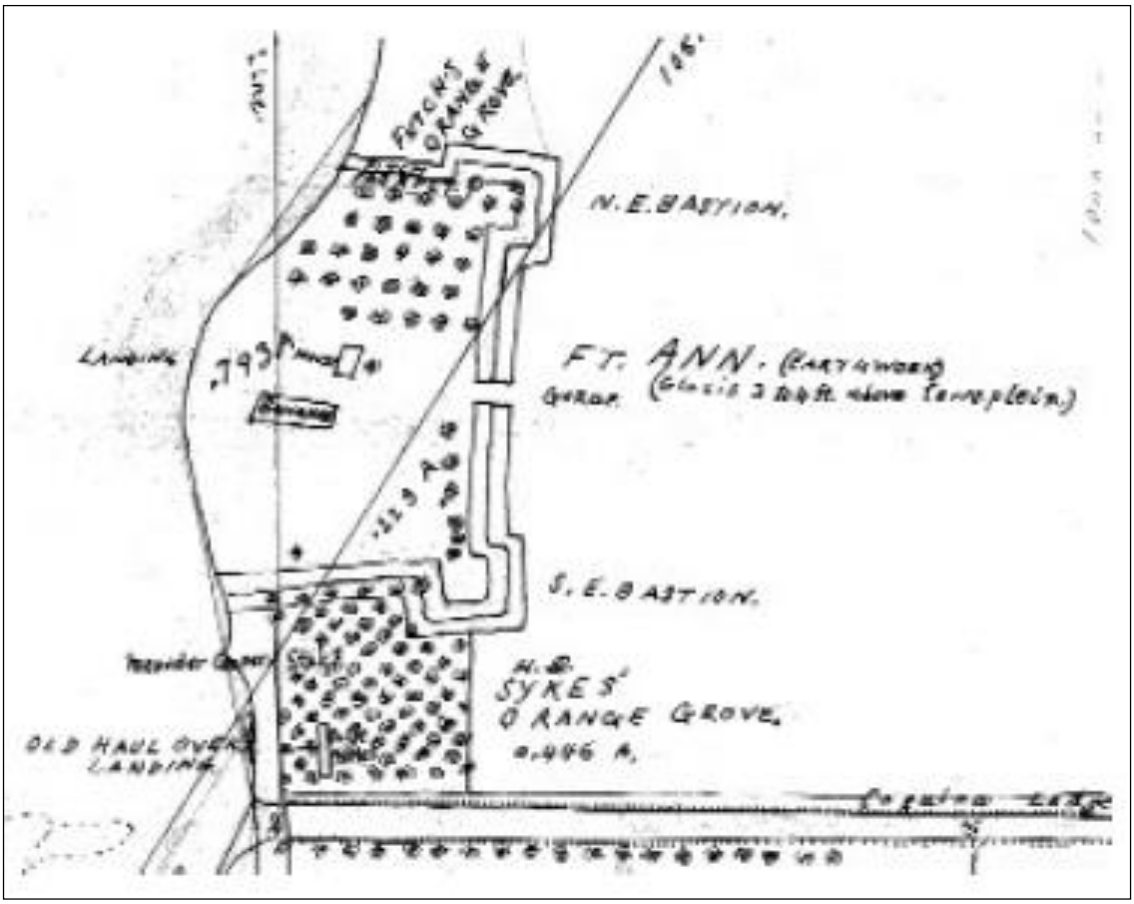


Figure 9-1. *Reproduction of the original hand-draw map of Ft. Ann by J. Francis LeBaron (from Paterno 2003:13).*

The Second Seminole War lasted until 1842, when the federal government decided to end the conflict by withdrawing troops from Florida. Some of the battle-weary Seminoles were persuaded to migrate west where the federal government had set aside land for Native American inhabitation. However, those who were adamant about remaining were allowed to do so, but were pushed further south into the Everglades and Big Cypress Swamp. This area became the last stronghold for the Seminoles. The surveys and maps of the Florida peninsula and the establishment of improvements such as trails and forts resulting from the war provided invaluable assistance in the settlement of Florida (Mahon 1967:321).

Encouraged by the passage of the Armed Occupation Act in 1842, which was designed to promote settlement and protect the Florida frontier, Anglo-American pioneers and their families moved south through Florida. The Act made available 200,000 acres outside the already developed regions south of Gainesville to the Peace River, barring coastal lands and those within a two-mile radius of a fort. The Armed Occupation Act stipulated that any family or single man over 18 years of age able to bear arms could earn title to 160 acres by erecting a habitable dwelling, cultivating at least five acres of land, and living on it for five years. During the nine month period the law was in effect, 1184 permits were issued totaling some 189,440 acres (Covington 1961:48; Dunn 1989:24-25). Prospective settlers filed 112 patents for land along the Indian River between Merritt Island and Lake Worth. These settlements collectively received the name of the Indian River Colony (Shofner 1995:45).

RELEASED - Printed documents may be obsolete; validate prior to use.

Although the boundaries of Brevard County underwent many changes, in 1844, it became Florida's twenty-fifth county (Morris 1986). A year later, Florida was admitted to the Union with Tallahassee as the capital. It was during this time that the U.S. Government began land surveys. Most of the exterior boundary lines of the Townships and Ranges included within today's KSC property were surveyed in 1843 and 1844 by H. Washington (DEP 1843a, 1843b, 1843c, 1843d, 1844a, 1844b, 1844c, 1844d, 1844e, 1844f, 1844g, 1844h, 1844i, 1844j) while others were surveyed by W. S. Harris in 1860 (DEP 1860a, 1860b, 1860c, 1860d, 1860e, 1860f, 1860g). The private Spanish Land Grant claims of Antelm Gay, the heirs of N. Gomez, and Lucas Crayon, were surveyed by D.H. Burr in 1850 (DEP 1850). The resulting plats for the private claims show several features on the properties such as the "Road to the Haulover," the "Old Road" between the three properties, two canals, several "old fields," a "mound," and an "Orange Grove" (DEP 1852a) (Figure 9-2). The field notes for the Burr survey also mention the road and the "old field of canals," but also include an orange grove, the site of an "old home," and an "old chimney" (DEP 1850:202, 209-211, 214-216). Interestingly, the Gomez land grant is situated within the Gay grant.

RELEASED - Printed documents may be obsolete; validate prior to use.

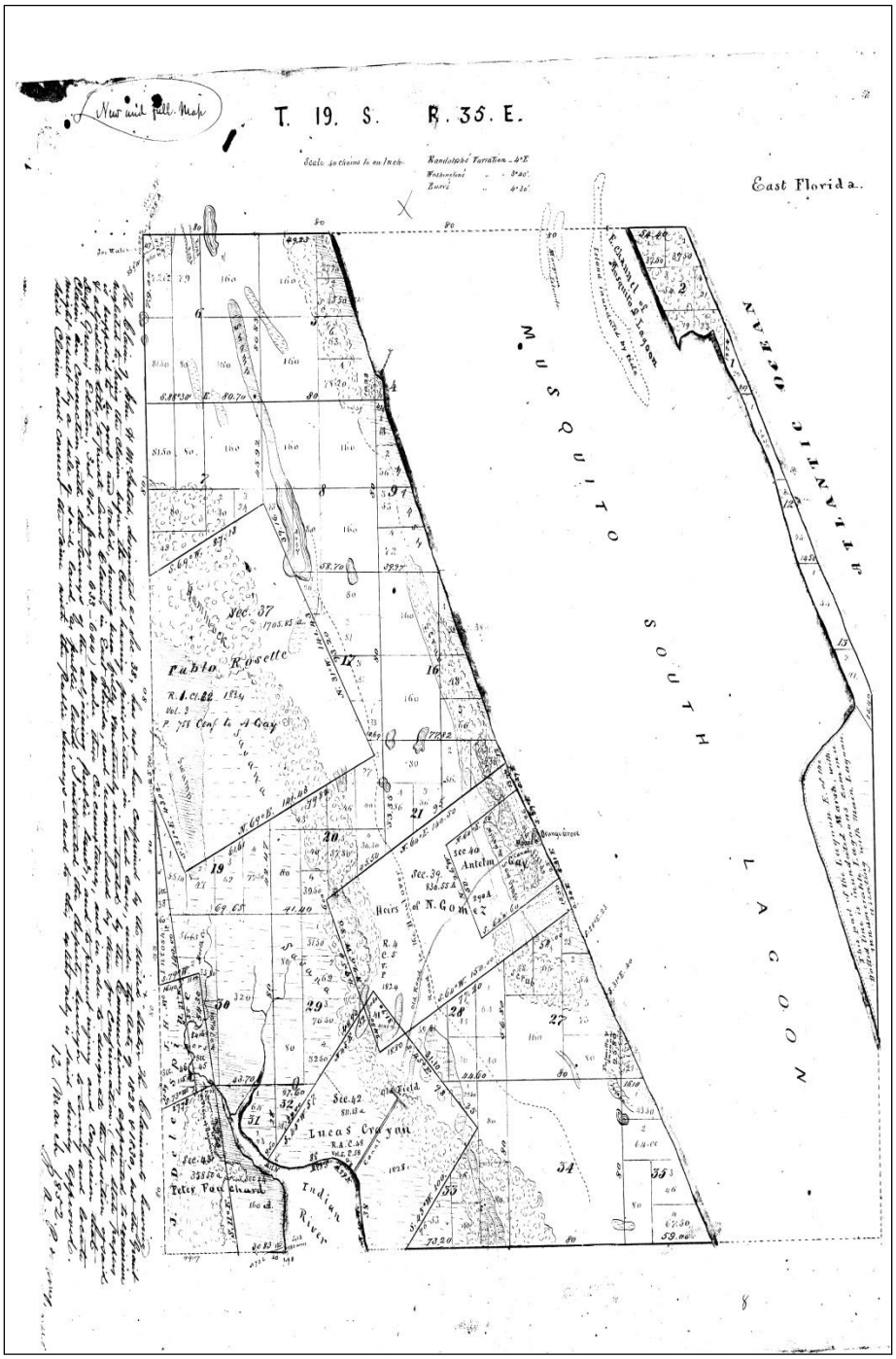


Figure 9-2. *Plat showing the land grants of Antelm Gay, H.M. Gomez, and Lucas Crayon (from State of Florida 1852a).*

The plats for the remainder of KSC's property are descriptive in terms of environmental features, but no man-made features other than the "Haulover" and the "Old trail leading from the Haulover to Smyrna" are noted (DEP 1848). "Meritts Island," the Indian River, Mosquito Lagoon, Banana River, the "West Channel," the "Main or Middle Canal," the "East Channel," and the direction of water flow in these

RELEASED - Printed documents may be obsolete; validate prior to use.

waterways are easily identified on the plats (DEP 1845, 1846, 1859, 1860e, 1860f). In one case "Hillsboro River or Mosquito South Lagoon" is used (DEP 1852b). "Palmetto scrub," "Savanna," "scrub," "inundated marsh," "mangrove," and "hammock" are all used to describe the land on the plat maps (DEP 1845, 1846, 1859, 1860e, 1860f).

One important development during these early years prior to the Civil War was the opening of the first Haulover Canal. Recommendations for the construction of a canal began as early as 1824. An appropriation was passed in 1844 and the canal was completed in 1854. It measured approximately one-third of a mile in length, 10 to 12 feet in width, and three feet in depth. One of the first major man-made improvements to the inland waterway system, it allowed shallow draft vessels to cross from Mosquito Lagoon into the Indian River (HPA1987; Lincoln 1882).

Throughout the intervening years between the Second and Third Seminole Wars, tensions erupted periodically between settlers and Seminoles. For example, in 1849, a renegade group of Seminoles attacked the Indian River Colony established by the Armed Occupation Act. As a result, the remaining settlers abandoned their land to flee to the safety of St. Augustine (Shofner 1995:52). Then, in December of 1855, the Third Seminole War, or Billy Bowlegs War, started as the result of pressure placed on Native Americans remaining in Florida to move west (Covington 1982). This war started in present-day Collier County when Seminole Chief Holatter-Micco, Billy Bowlegs, and 30 warriors attacked an army camp killing four soldiers and wounding four others. The attack was in retaliation for damage done by several artillerymen to property belonging to Billy Bowlegs. This hostile action renewed state and federal interest in the final elimination of the Seminoles from Florida. As a result, several regional military posts were established (Tebeau 1966).

Military action was not decisive during the war; therefore, in 1858, the U.S. Government resorted to monetary persuasion to induce the remaining Seminoles to migrate west. Chief Billy Bowlegs accepted $5,000 for himself and $2,500 for his lost cattle, each warrior received $500, and $100 was given to each woman and child. On May 4, 1858, the ship Grey Cloud set sail from Fort Myers with 38 Seminole warriors and 85 Seminole women and children. Stopping at Egmont Key, 41 captives and a Seminole woman guide were added to the group. This made a total of 165 Seminoles migrating west. On May 8, 1858, the Third Seminole War was declared officially over (Covington 1982:78-80).

The 1860 census counted only 267 individuals living in Brevard County. Slaves comprised a third of the population and many of them were owned by farmers of little means. Most of the settlers in the Indian River area grew subsistence crops, but, according to the 1860 census taker, no individual or firm yielded any product, which was valued above $500 per year. Cattle ranching composed the largest industry in the county; 39 people owned cattle with five of those owning more than 3,000 head (Shofner 1995:65-66).

In addition to subsistence crops, citrus was commercially grown in the region as early as the 1820s. Col. Thomas Dummett and son, Captain Douglas Dummett, acquired 3,000 acres on the northern end of Merritt Island in 1818. By 1828, barrels of fruit were commercially shipped from the Dummett groves in cypress logs poled by slaves. One vessel, the shallow draft Minorcan Sailor could hold as many as 50 crates of oranges and was used for many years. In addition to the groves, the Dummetts were involved in many endeavors in the region. Col. Dummett had served in the British Royal Marines and had been a planter on Barbados before fleeing the island to settle in Florida.

Captain Douglas Dummett was the customs house officer at New Smyrna and had been active during the First Seminole War and, as a result, received land in payment for his service. He was an officer with the "Mosquito Roarers," a militia organized by Mosquito County residents prior to the Second Seminole War (Hellier 1965; HPA 1987:5-7). Douglas Dummett took advantage of the 1842 Armed Occupation Act and

RELEASED - Printed documents may be obsolete; validate prior to use.

acquired the lands near Fort Ann on March 16, 1843; this land would later become known as Dummett Grove (Griffin and Miller 1978:84, 114). He lived on the property with his common-law wife Leandra Fernandez and his three daughters, Louisa, Kate, and Mary. Dummett's sparsely-furnished house was a single room with a large coquina fireplace. Structures around the house included a storehouse elevated on posts, an open kitchen structure, and a boathouse. When Dummett died in 1873, he was not present on the property (ACI 1992a:28; Griffin and Miller 1978:116-120). He was a pioneer citrus grower and was the first state representative from the Titusville area following statehood (Hellier 1965:5-7; HPA 1987). Budwood from his citrus grove was sold to many other growers in the general area (HPA 1987). His daughter, Kate, married Andrew Jackson, one of the original settlers in the Clifton/Haulover area (Eriksen 1994:136; Shofner 1995). Remains associated with the Dummett home and grove (8BR78) have been documented on KSC's property (ACI 1992a:28; Griffin and Miller 1978:113-122), and it is likely that additional remains associated with the Dummett enterprises are present (Brewer 1991:79-81).

5.0 CIVIL WAR AND RECONSTRUCTION

In 1861, Florida followed South Carolina's lead and seceded from the Union in a prelude to the American Civil War. Florida had much at stake in this war as evidenced in a report released from Tallahassee in June of 1861. It listed the value of land in Florida's 35 counties as $35,127,721 and the value of the slaves in the state at $29,024,513 (Dunn 1989:59). The population of Brevard County was only 264 in 1860 (Olausen 1991). Even though the coast of Florida experienced a naval blockade during the war, the interior of the state saw very little military action. In fact, the blockade had little effect on many of the self-sufficient individuals of inland Florida (Parker 2002). One of the major contributions of the state to the war effort was in the supplying of beef to the Confederate Government. The Confederate Government estimated that three-fourths of the cattle, which Florida supplied to the Confederacy, originated from Brevard and Manatee Counties (Shofner 1995:72). In addition to beef, salt, as a necessity for food production, became an important commodity. Union officials saw the elimination of the Confederacy's sources of salt as an important step in shortening the war. Several locations along Florida's coast were used for Civil War salt production, including Cedar Key, St. Marks, Apalachicola, and Key West. While local histories describe the destruction of a salt works in the general area of today's KSC, there is no mention of the disabling of a salt works in the correspondence of S.F. Dupont, an officer involved in the Union Blockade of the inland waters off Mosquito Inlet (Parker 2002). The Civil War lasted until 1865 when General Robert E. Lee surrendered to General U.S. Grant at Appomattox Courthouse in Virginia.

Immediately following the war, the South underwent a period of "Reconstruction" to prepare the Confederate States for readmission to the Union. The program was administered by the U.S. Congress and on July 25, 1868, Florida officially returned to the Union (Tebeau 1971:251). During this Reconstruction period, Florida's financial crisis, born of pre-war railroad bonded indebtedness, led Governor William Bloxham to search for a buyer for an immense amount of state lands. Bloxham's task was to raise adequate capital in one sale to free, from litigation, the remainder of state lands, for desperately needed revenue. In 1881, Hamilton Disston, a Philadelphia investor and friend of Governor Bloxham, purchased four million acres, including property within today's KSC, from the State of Florida in order to clear the State's debt. This transaction, which became known as the Disston Purchase, enabled the distribution of large land subsidies to railroad companies, inducing them to begin extensive construction programs for new lines throughout the state. Hamilton Disston and the railroad companies, in turn, sold smaller parcels of land to developers and private investors. Complete sections of property were purchased by the Florida Coast Line Canal and Transit Company beginning as early as 1885, with most land purchased in 1906. The Jacksonville, Tampa, and Key West Railway Company also purchased numerous lots within today's KSC as early as 1880 (DEP n.d.-b, n.d.-c, n.d.-d, n.d.-e, n.d.-f, n.d.-g, n.d.-h, n.d.-i, n.d.-j, n.d.-k).

RELEASED - Printed documents may be obsolete; validate prior to use.

6.0 INITIAL SETTLEMENT OF AREA

The Civil War stimulated growth in the Indian River area in two ways: many Southerners sought new homes to escape the unrest in the neighboring ex-Confederate states, and the war brought prosperity to a large number of Northerners who sought vacation homes in warmer climates (Shofner 1995:83). In an 1879 itinerary from St. Augustine to Miami, Sand Point, today's Titusville, is described as having a post office and two stores. Merritt (or Merritt's at the time) Island is described as "mostly pine land and has not a half dozen settlers on it" (Unknown 1940:214). Also mentioned in the account are the "canal," Dummett's summer house, and several orange groves in the area (Unknown 1940:214). At the end of the 1870's, 21 one-room schools existed in Brevard County and functioned on a budget of $2,500 (Stone 1988).

One of the newcomers to the area after the Civil War was Ecole (Ercole, Nicole) Tamajo, a rumored Italian nobleman known as Duc de Castellucio (Duke of Castalucci). After Dummett's death in 1872, he bought what was left of the Dummett land in 1881. Much of the property had been given to Dummett's slaves upon his death. De Castellucio, who was married to Jenny Anheuser of the American beer-making family, expanded the estate to 30 acres and, in 1881, built the three-story, 20-room "Duke's Castle," also known as "Dummett's Castle," from a wrecked vessel (Parrish et al. 2001) (Photo 1). Purchased in the 1960s by the Brevard County Historical Society, the structure later was moved to a site on the causeway near Titusville for use as a museum and was subsequently destroyed by a fire after its transfer (ACI 1992a:30; Mote 1977:42). In 1873, the Sand Point Post Office was changed to Titusville and the town continued to grow. Thus, by 1880, 1497 individuals resided in Brevard County and by 1885, Titusville had a population of 250 (HPA 1987).

Photo 1. *The Duc de Castellucio home in the original location (from Parrish et al. 2001:12).*

Improvements in the transportation systems played a major role in fostering growth within the area. By the early 1880s, steamboats regularly serviced the Indian River communities. An 1875 account described how a party could be "hauled over" by sailboat to Titusville, through the Haulover, "thence to the St.

RELEASED - Printed documents may be obsolete; validate prior to use.

Johns River by land, thence by steamer to Palatka. Time four days cost $10.00 to Jacksonville" (Hellier 1965:21). Publications in popular magazines such as Harper's New Monthly Magazine and pamphlets extolled the area's recreational attractions and noted places to visit. Dummett's orange groves, the abundant wildlife seen from the steamers, and the haulover are frequently described (Barbour 1884; Henshall 1884). Alternately, northern visitors could enter Florida by train to Jacksonville and then board a steamer that carried them to the shores of Lake Poinsett. From there they traveled to Rockledge by wagon where they could continue south on the Indian River (Shofner 1995:97-100). A second overland route began at Enterprise and included travel by horse or wagon to Titusville. Mail and freight traveled down the St. Johns via steamboat to Sanford where it was transferred by smaller boat to Salt Lake and from there overland to Titusville (HPA 1987).

LeBaron's 1880 description of the Haulover Reservation summarizes the area as scrub, oak, and palmetto. He describes the soil as "generally bright reddish yellow and is underlaid with coquina rock." He describes the land as "admirably adapted for the cultivation of pineapples . . . oranges, lemons, limes" (State of Florida 1880:215). Lots owned by homesteaders R.U. Wright, Charles H. Nauman, and Andrew Jackson, are mentioned in his survey notes, as are the fences, sweet orange groves, pineapple patch, bananas, and kitchen garden of Henry D. Sykes. LeBaron also mentions the one-story, unfinished home and wharf of Sykes, all located south of the Haulover Canal (DEP 1880:182-194, 215) (Photo 2). In a January 1882 letter from the Secretary of War, a history of the U.S. Government involvement with the haulover and a detailed description of LeBaron's survey "with a view to opening a passage to Mosquito Harbor, by way of the Haulover . . ." is found (Lincoln 1882). Figure 9-3 is the chart that accompanies this report and Figure 9-4 is the plan of the canal and reservation.

Photo 2. *A 1910 photo of the old Haulover Canal. By the time of LeBaron's visit, the new Haulover had been constructed (from Brevard County Historical Commission).*

LeBaron also offers many interesting comments and notes in his 1882 report on the prehistoric sites of Florida for the Board of Regents of the Smithsonian Institution. While discussing the numerous prehistoric mounds and shell heaps, or kjökkenmöddings as LeBaron called them, of the Mosquito Lagoon and the Indian and Banana Rivers, he mentions several home sites as a way of identifying the

RELEASED - Printed documents may be obsolete; validate prior to use.

prehistoric site locations. These include the wharf, headquarters, and office of Captain Swift near site 8VO129, a wild orange grove and canal he believed to be the work of Turnbull's colonists at sites VO130/131, Mr. Nauman's house 200 feet east of mound site 8BR77, and the home site of P.E. Wager about 300 feet from the east bank of the Indian River at the river's head (LeBaron 1884).

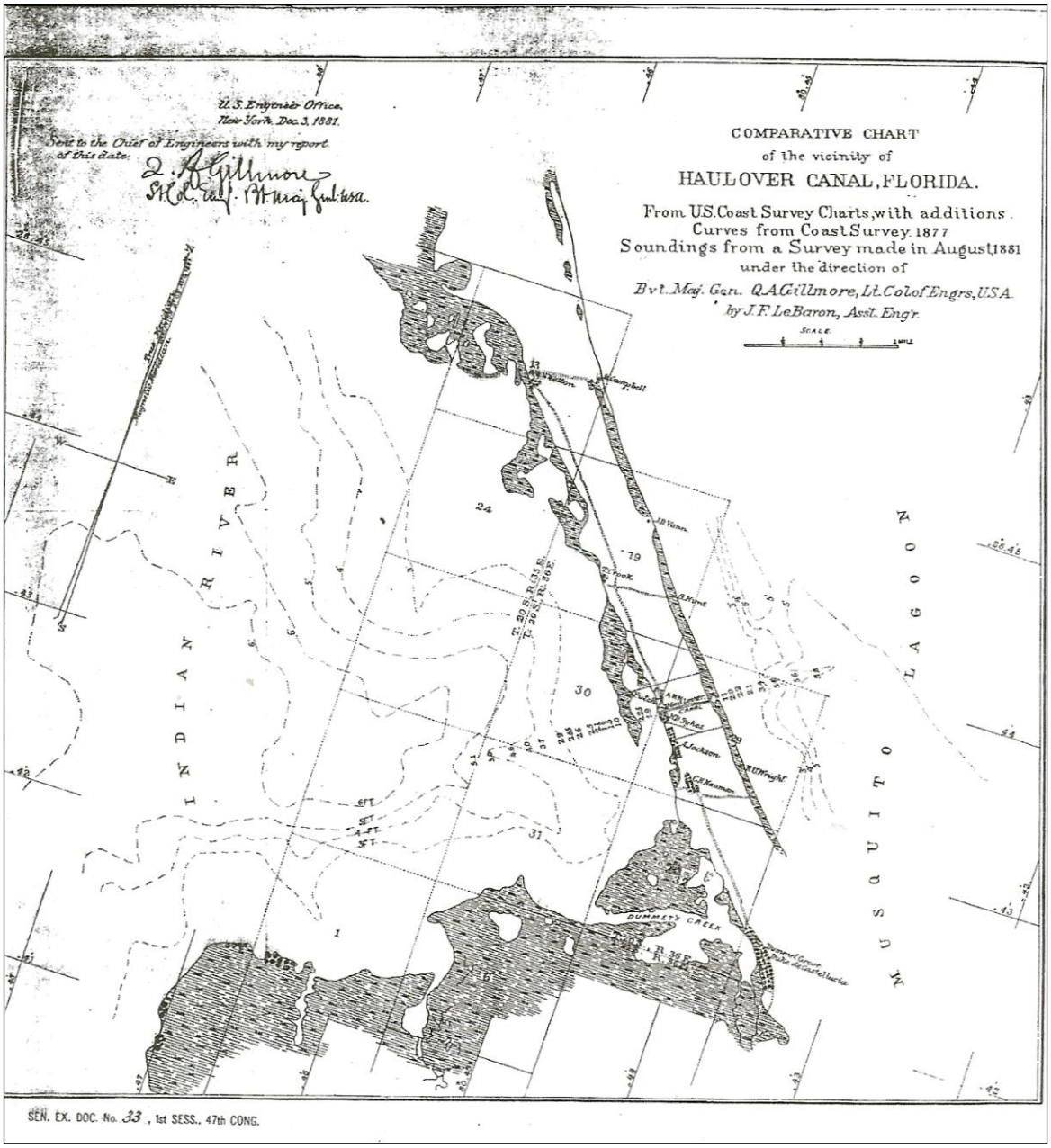


Figure 9-3. *LeBaron's Comparative Chart of the vicinity of Haulover Canal, Florida (from Brevard County Historical Commission).*

RELEASED - Printed documents may be obsolete; validate prior to use.

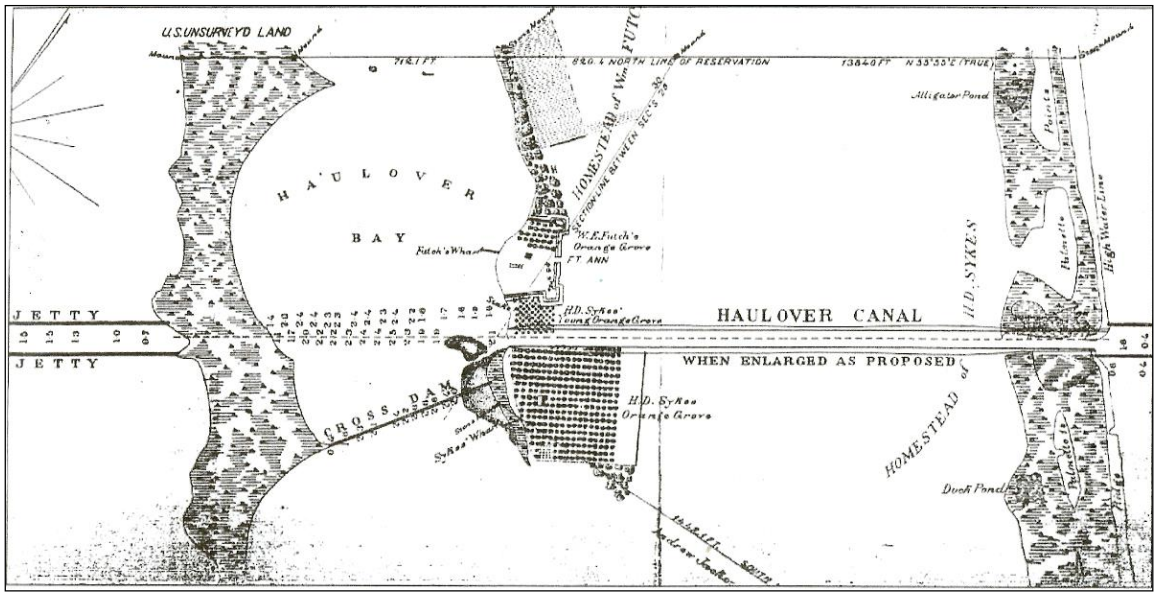


Figure 9-4. *LeBaron's Plan of the Haulover Canal and Reservation (from Brevard County Historical Commission).*

Beginning in the 1870s several Houses of Refuge were situated along the Florida coastline to rescue and shelter ship-wrecked sailors. In 1882, an Act of Congress authorized the construction of several more Houses, including the Chester Shoals House of Refuge (Voss 1968). According to Mote (1977:59), "in 1884 specifications for five houses of refuge for the Florida Coast were drawn up by the U.S. Life Saving Service (which combined in 1915 with the U.S. Lighthouse Service to form the U.S. Coast Guard)." From 1886 until 1915, this facility had a single keeper, Mr. Orlando Quarterman. The station was in use until 1934, and in 1949, it was turned over to the U.S. Department of the Interior. Chester Shoals continued to be used as a Coast Guard Station and training station until World War II (Nolen 2004:82; U.S. Coast Guard 2008). The Chester Shoals station house, like all those built during the period 1875 to 1885, was designed by Francis W. Chandler (Parrish et al. 2001) (Photo 3). Chester Shoals station had a large wood frame main building constructed on piers, having a side-gated roof, chimney at the north end, and wrap-around porch with diagonal porch-support braces. Two outbuildings, a garage, and bathhouse were located a short distance to the south (ACI 1991:26).

RELEASED - Printed documents may be obsolete; validate prior to use.

Photo 3. *Photograph of the Chester Shoals House of Refuge (from Parrish et al. 2001:16).*

In 1886, the Atlantic Coast, St. Johns, and Indian River Railroad ran a spur line from Enterprise to Titusville. Shortly thereafter, the line was leased to the Jacksonville, Tampa, and Key West Railroad (JTKW) (Shofner 1995:106-113). The same year, a 1,500-foot dock that extended into the Indian River was built. Track was laid on the dock so the trains could connect with the Indian River Steamboat Company boats, an extension of the JTKW (Foster 2007). By 1892, the JTKW entered into receivership while Henry M. Flagler busily extended his Florida East Coast (FEC) railroad south to the Indian River area. Flagler, a partner with John D. Rockefeller in Standard Oil, visited Florida in 1878, and decided to build a hotel in St. Augustine and a railroad to reach it from Jacksonville. Eventually, this developed into a string of hotels and a railroad, which ran the length of the East Coast of Florida. The railroad had an immediate impact on the entire Indian River region. It allowed the rapid entry of tourists and permanent settlers while facilitating the export of products to northern markets. The railroad also helped to foster the growth of businesses directly and indirectly associated with the tourist and fruit industries such as ice plants, packing houses, and canneries (Shofner 1995:106-113).

In 1881, a survey reported that 204 orange groves located along the Indian River had produced 14,000 boxes of fruit that year (Shofner 1995:180). Although the orange industry suffered from a freeze in 1886 and repeated freezes in the 1894-95 season, area groves rebounded. Indian River oranges became famous nationwide and brought from 50 cents to one dollar per box above other brands in northern markets. Because of this popularity, some growers were marketing their own fruit under fraudulent Indian River labels. To protect their reputation and trademark, orange growers in the area formed the Indian River Orange Growers Association in 1892 (Shofner 1995:183). Of the 3,000,000 boxes of fruit produced in 1890 in Florida, 60,000 came from the Indian River Region (Tebeau 1971). Other industries, such as commercial fishing, lumbering, naval store production, and pineapple and vegetable farming, continued to develop as well.

By the 1880s, there were several settled towns and communities within today's KSC property boundaries. The northernmost was **Shiloh**. It was settled beginning in the 1880s by the Kuhl, Griffis, Taylor, and Pattillo families (Shofner 1995:136-137). John Kuhl purchased several portions of Sections 33 and 34 of

RELEASED - Printed documents may be obsolete; validate prior to use.

Township 19 South, Range 35 East in 1884 from the government (State of Florida n.d.-a:75). Originally from Golconda, Illinois, Kuhl, along with his son George and daughter Hattie, arrived using various means of travel including stage, sailboat, and mule team. First living in a "palmetto shack of two rooms and a hall", the family later moved to a "new home of eleven rooms, one mile east of . . . the post office" (Unknown 2007:17-18). George Kuhl owned and operated the *Golden Rule*, a sailboat that traveled along the Indian River utilizing the Old Haulover Canal. The merchandise to be sold had to be loaded onto a barge and the sailboat would be pushed through the canal. His daughter, Hattie, married John Griffis in 1896 (USCB 1900).

Manning Griffis, his wife, and seven children arrived in the area in 1876. After living for four years in a "palmetto shanty," they built a home in part from scavenged lumber from a wrecked schooner. The house was still occupied in 1925 by Jerry Griffis, the first child born in the area (Unknown 2007:23). Like many in the Shiloh area, the Griffis family was involved in growing citrus (Photo 4) and, soon after moving to the area, established a nursery (Thompson 2008a, 2008b).

In 1889, J.E. Pattillo, his wife, and three children moved to Shiloh and lived in a one room home. His original 25-acre grove froze in 1895, but within a few years the Pattillo Groves were flourishing. By 1925, the year J.E. Pattillo died, he lived on 300 acres with a home for both he and his son (Crawford Pattillo) with electricity supplied by a Delco Plant, several machine shops, garages, and tenant homes. More than 150 acres were planted in citrus and banana (Unknown 2007:19).

The Taylor family, James, Ollie, and three children, arrived in Shiloh in 1893. Beginning with 5 acres of grove, he slowly added to his acreage and at one time owned 1,500 acres. In 1925, James Taylor had 120 acres in groves, was president of the Shiloh Packing Company (Photo 5) and was supervisor of the Shiloh School (Photo 6). The Taylor family had a Delco Plant-lighted home and a store on the Island (Unknown 2007:20-21).

Photo 4. *Photograph of the J.W. Griffis Packing House. Included are children of the Harmon, Taylor, Bennett, and Mosby families. Willie Griffis is to the left, second row, in the suit (Courtesy of Dana Thompson).*

RELEASED - Printed documents may be obsolete; validate prior to use.

Photo 5. *Undated photograph of the Shiloh Fruit Packing Company (Courtesy of Dana Thompson).*

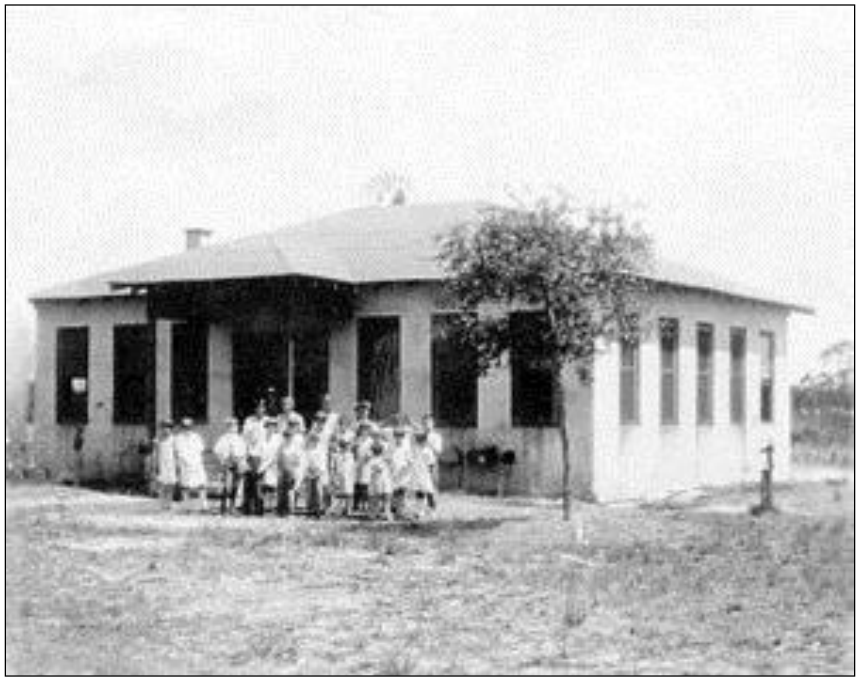


Photo 6. *Shiloh school around 1925 (from Historical Society of North Brevard 2008).*

Others purchasing land in the general area of Shiloh included F.W. Sams and John McLane in 1876, Cephas B. Magruder in 1882, Frederick D. Lenk in 1882, John D. Sears in 1883, and Henry D. Futch in 1885 (DEP n.d.-a:75). A post office was established in the town in 1884 (Photo 7) and in 1886 George C. Kuhl, an orange grower with 10 acres of groves, became the postmaster in the town's only general store (Bradbury and Hallock 1962) (Photo 8). This same year, Shiloh had 35 residents, including W.F. Locky, a schoolteacher (Parker 2002). By 1934, a detailed Intracoastal Waterway map shows several structures and numerous orange groves in the area (Dunn 1934).

RELEASED - Printed documents may be obsolete; validate prior to use.

Further to the south were the communities of **Clifton** and **Haulover**. Clifton is located approximately two miles north of the old Haulover Canal. In 1886, Charles H. Nauman became the postmaster of Haulover and mail was delivered daily. A post office had been established in the area as early as 1882, but had experienced several openings and closings (Bradbury and Hallock 1962:136; Shofner 1995:136). Mr. Nauman, originally from Lancaster, Pennsylvania, was the executor of the Dummett estate and was a nephew of Douglas Dummett (Parker 2002). Other residents in town were J. S. Vann, who had a store and restaurant; Wade Holmes; and the William Watton family (Shofner 1995:136). E.D. Seabrook was the schoolteacher (Parker 2002). An 1889 Florida Encyclopedia describes Haulover with a population of 100, as sandy land, "adapted to orange, pineapple, banana, and lemon growing. Land can be bought at $5.00 per acre" (Elliott 1889). Haulover was renamed Clifton in 1889, and a new postmaster, Thomas R. Crook, was appointed (Shofner 1995:136).

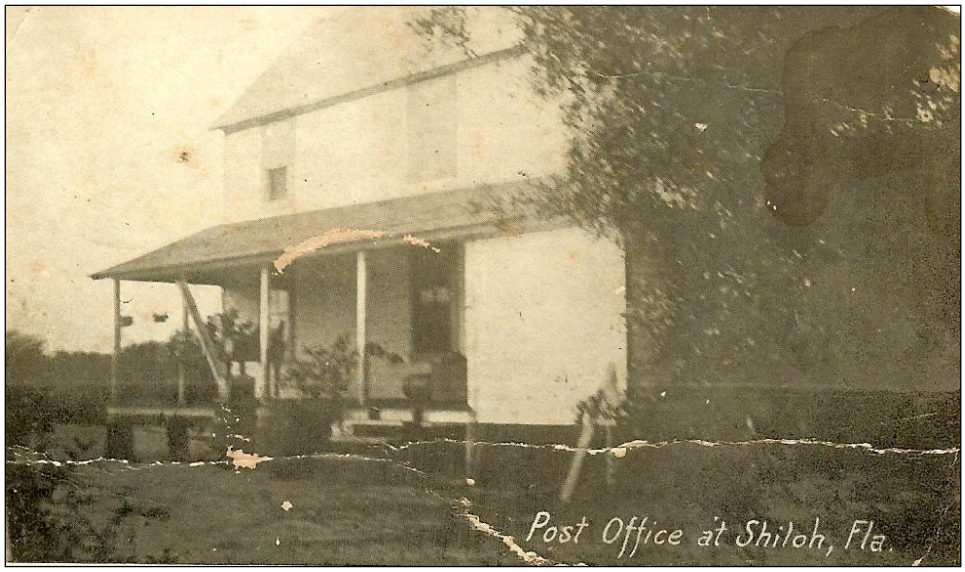


Photo 7. *Undated photograph of Shiloh post office (Courtesy of Dot Moore).*

Photo 8. *Photograph of G.C. Kull at his home in Shiloh, taken around 1913(Courtesy of Dot Moore).*

RELEASED - Printed documents may be obsolete; validate prior to use.

Butler Campbell, a former slave, purchased 60 acres of land in the Clifton area from the state in 1875 (Shofner 1995; DEP n.d.-c: 77). Born in Anderson, South Carolina, on October 26, 1848, he settled in Clifton in 1872. He died on June 16, 1922, of a self-inflicted gunshot wound at the age of 73. He is buried in the Campbell/Jackson Cemetery along with his wife, Lucy Warren Campbell, who died in 1900, and a few of their children (Cleveland 1983).

Others purchasing property in the racially-mixed Clifton area included Juliet Fairbanks in 1875, Henry and William Watton in 1876, Thomas Bassnett in 1881, and Manning Griffis in 1883 (DEP n.d.-c:76-77). Andrew Jackson, married to Kate Dummett Jackson, the daughter of Douglas Dummett, developed an orange grove on property purchased from Butler Campbell. Jackson and Campbell decided their children should attend a proper school, and in 1890-91, the "colored school", with M. R. Mahaffey as the teacher, was built (Foster 2006; Shofner 1995:136-137). The school was a 12-by-16 foot pine structure, resting on hand-cut coquina block, approximately one foot off the ground (Foster 2008) (Photo 9). In 2008, remnants of the structure were dismantled for eventual restoration and reconstruction (Penders 2008b). Andrew Jackson died in 1921; his wife, Kate Dummett Jackson, predeceased him in 1918 (ACI 1996:31). Both are buried in the cemetery north of the Haulover Canal (Parker 2002). A hand-drawn map of Clifton dating to the 1928-1930 shows the layout of the town (Figure 9-5).

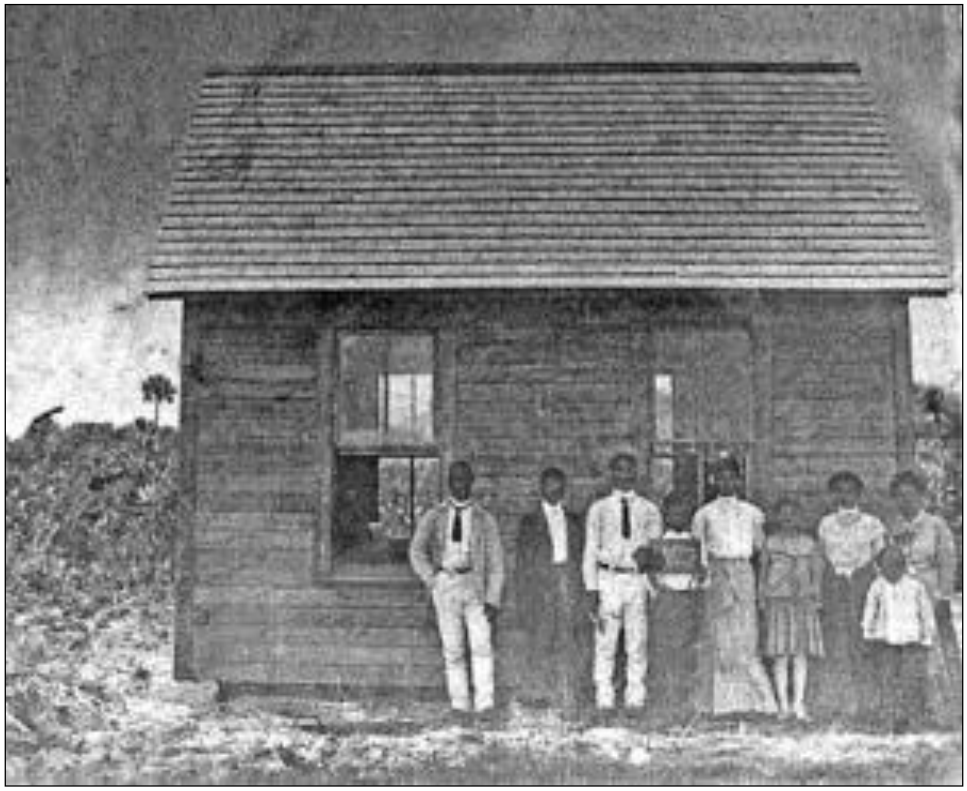


Photo 9. *Clifton school in the 1890s (from wwww.ghosttowns.com).*

RELEASED - Printed documents may be obsolete; validate prior to use.

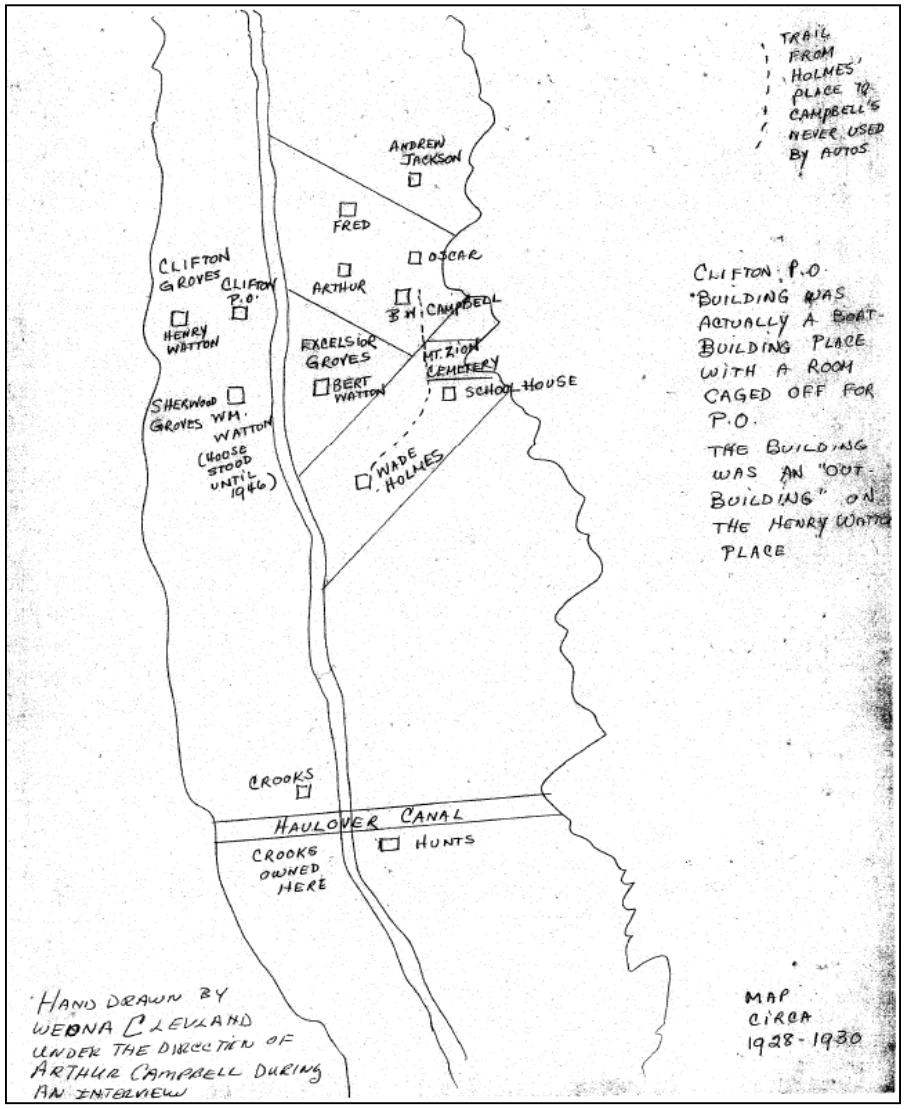


Figure 9-5. *Hand-drawn map ca. 1928-1930 of Clifton (from Penders 2008b:44).*

In 1888, the New Haulover Canal had replaced the old canal and the community of **Allenhurst** had been established at the new location. The United States Coast Survey recommended the new site for the canal after the Florida Coast Line Canal and Transportation Company had failed to maintain the old canal, despite receiving over a million acres for its improvement and the construction of an additional 263 miles of canal in the state (Parker 2002). The name Allenhurst appears on several 19th and 20th century maps, including the 1920 U.S. Railroad Administration map and the 1934 Intracoastal Waterway map (Dunn 1934). The town was platted and surveyed in 1913 by C. H. Greenwood and is listed as property of the Indian River Fruit Company (Figure 9-6). With its headquarters in Madison, Wisconsin, the Indian River Fruit Company advertised Allenhurst as "the place that's different" (Shofner 1995:248). In 1907, the Indian River Haulover and Outing Club was established on property obtained from Mr. J. Allen; the club claimed a membership of 30 from Madison alone (Shofner 1995:237-237). A post office was established in the town in 1914, despite the presence of one two miles to the north at Clifton (Shofner 1995:248). A 1900s photograph of the *Eclectic* vessel docked in Allenhurst shows several structures in the town (Photo 10). The *Eclectic* was owned by the James Heddon and Sons Fishing Tackle Company of Dowagiac,

RELEASED - Printed documents may be obsolete; validate prior to use.

Michigan, and was used to experiment with lures and tackle manufactured by the company (Florida Memory Project 2007). A copy of a postcard, probably dating to the early to mid 1950s, shows the town and canal (Photo 11).

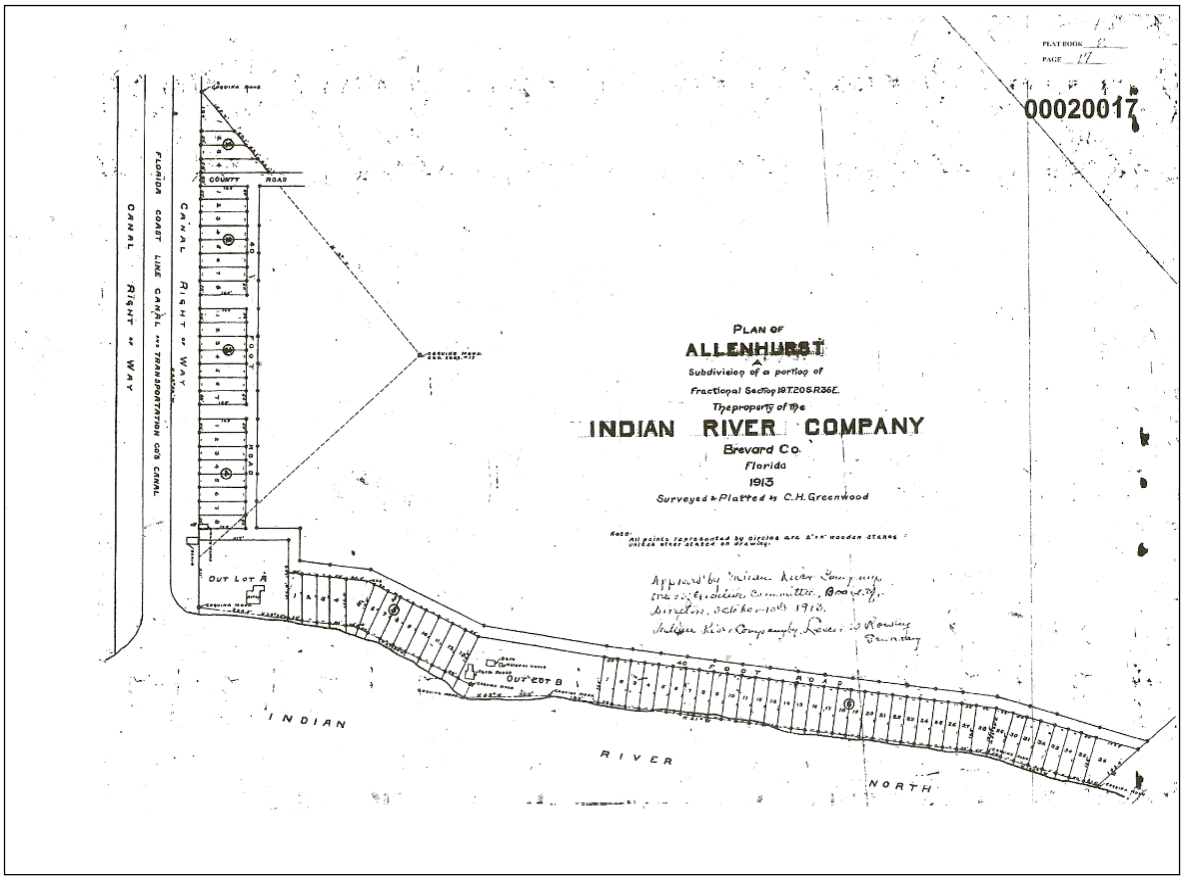


Figure 9-6. *Plat of Allenhurst (from Brevard County Historical Commission).*

RELEASED - Printed documents may be obsolete; validate prior to use.

Photo 10. *The Eclectic docked on the Indian River (from Florida Memory Project 2007).*

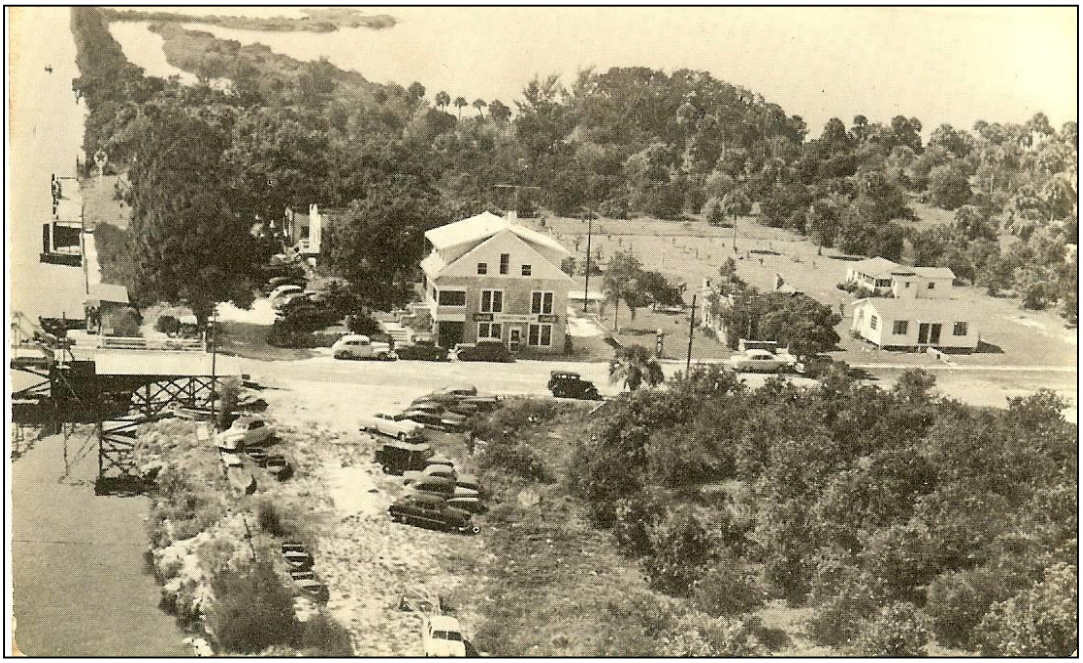


Photo 11. *Postcard showing the town of Allenhurst, probably circa early to mid-1950s (Courtesy of Dot Moore).*

According to the 1900 U.S. Federal Census, 82 individuals resided in the Haulover precinct (Precinct 16 of District 23, Brevard County). The 15 households enumerated were headed by 11 white and 4 black males; a 16th household was comprised of a group of fisherman, aged 13 to 39, who rented a house together. With the exception of this group of fisherman, the recorded occupation for all heads of

RELEASED - Printed documents may be obsolete; validate prior to use.

household was farmer. Among the heads of household listed in the 1900 Census were Thomas Crook, William Watton, Henry Watton, Andrew Jackson, James Taylor, Manning Griffis, Wade Holmes, Butler Campbell, Charles Nauman, and Henry Futch. Ben Childs, a 24 year old black male, was the school teacher. He and his family were boarders in the household of Andrew Jackson.

By 1920, the population of the Haulover precinct (now Precinct 12 of District 7) stood at 138 individuals, with 46 heads of household. Families who continued to reside in the Haulover area included those of Charles Nauman, Thomas Cook, William Watton, James Taylor, John and Jerry Griffis, Butler Campbell, Andrew Jackson, and Max Hoeck. Most people worked as citrus farmers, general farmers, and fishermen. John Griffis managed the family-owned citrus nursery.

The town of **Wilson** (Figure 9-7) or **Wilson's Corner,** named after President Woodrow Wilson, was located further to the south on the northern portion of Merritt Island at the junction of Max Brewer Memorial Parkway and Kennedy Parkway North. Land in the area was first deeded by the State in the early 20th century. Early land purchasers included Thomas J. Austin in 1916; and Guy Austin, Alvis R. Hardin, William E. Wheeler, Jane Ellen Nelson, Ralph A Scott, and William Shackleford in 1923 (DEP n.d.-e:221, 222). Early purchasers, such as the Austins from Chicago, advertised the Wilson lots for sale in the Midwest (Holzman 2003). During the 1920s through 1940s, the Wilson School was a center for public activities for those living in the area (Nolen 2004:84). A 1926-27 directory listed Rev. Robert Porter as the pastor of the Wilson Community Church; W. F. Wheeler as the postmaster; Alma Michleau as the teacher of the Wilson Public School; and Capt. George Quarterman as the caretaker of the Canaveral Club House (Parrish et al. 2001:13). Other occupations listed for inhabitants of the community include farmer, fisherman, and fruit grower (Parrish et al. 2001:13). Cattle raising is also assumed during the 1930's, as a cattle dip vat is listed as operating in Wilson in 1931, according to the records of the State Livestock Board (Florida Department of Natural Resources 2008).

Along the north side of Banana Creek, a small community developed in the Happy Creek area (Figure 9-8). Early homesteaders included Henry and Carolina Benecke. Originally from Germany, Henry Benecke first visited the area with a friend whose uncle, Max Hoeck, had settled approximately two and one half miles to the north (Nolen 2004). On October 19, 1895, Benecke was deeded 160 acres of land under the 1862 Homestead Act (in Section 31, T21S, R37E) (Nolen 2004:20; DEP n.d.-f: 70). Six children were raised in the Benecke family home (Photo 12). Son Herman worked for the Canaveral Club and daughter Lillie submitted articles to *Hunter, Trader, Trapper* under the pseudonym Uncle Dudley. The articles described the hunting and fishing expeditions, filled with adventure, of guests guided by her father (Nolen 2004). The Benecke Lodge at Happy Creek continued to be a popular hunting and fishing spot into the 1950s and early 1960s after additional property was purchased by descendants of Henry Benecke. It operated until 1962 when the land was sold to the U.S. Government to become part of KSC (Nolen 2004:72).

RELEASED - Printed documents may be obsolete; validate prior to use.

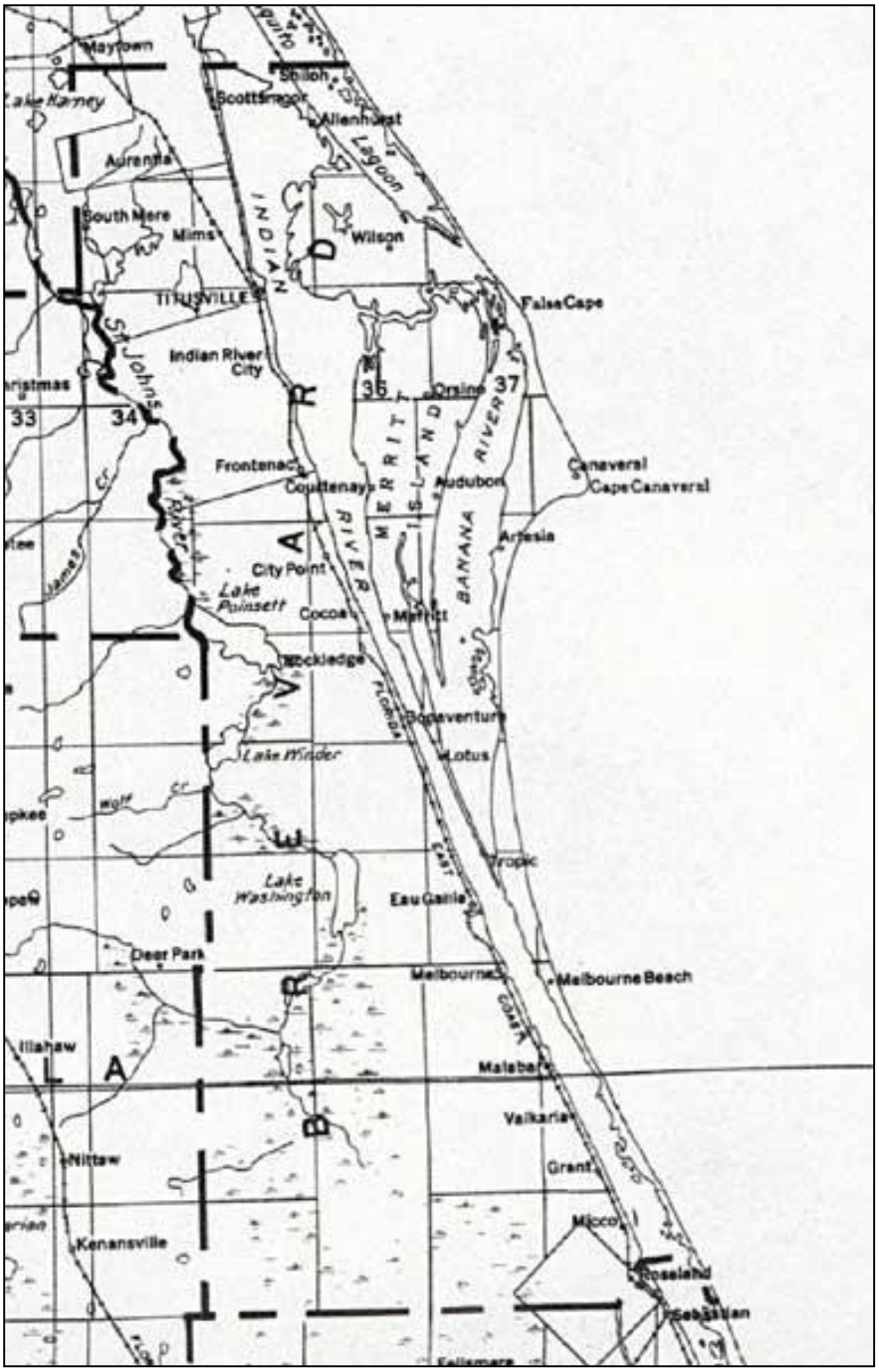


Figure 9-7. *1932 U.S. Geological Survey Map (from USF 2003).Note locations of Shiloh, Allenhurst, Wilson, Orsino, Courtenay, and Audubon.*

RELEASED - Printed documents may be obsolete; validate prior to use.

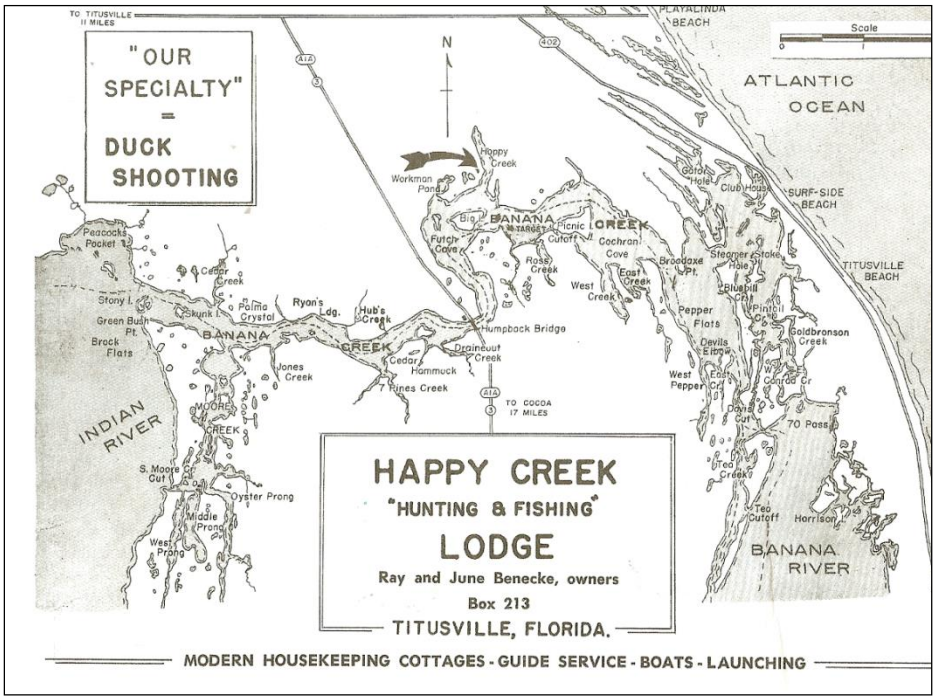


Figure 9-8. *Advertisement for Happy Creek Lodge (from Nolen 2004:72).*

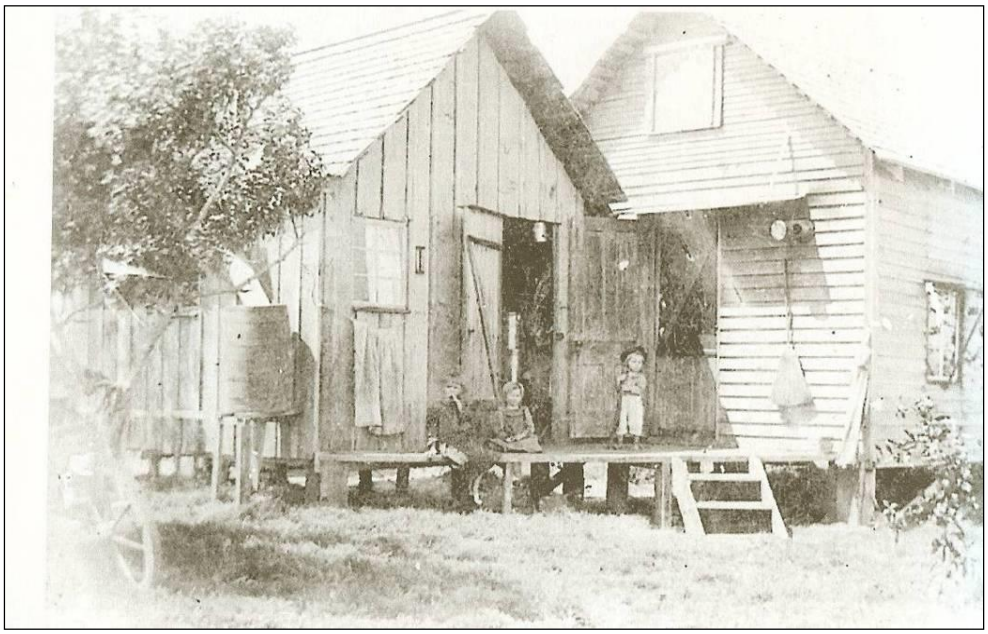


Photo 12. *Photo of Benecke homestead (from Nolen 2004:28).*

Midway on Merritt Island, at the junction of today's NASA Parkway and Kennedy Parkway South, was the town of **Orsino** (Figure 9-7). Early land purchasers included Dick Rudesill and William Elliot in 1919; Howard H. Elliot in 1922; and Charles A. David in 1926 (DEP n.d.-h: 227; n.d.-i:76; n.d.-k:77). Much of the area around Orsino was planted in citrus; some of the groves were owned by individuals

RELEASED - Printed documents may be obsolete; validate prior to use.

living in the immediate area and others living in Titusville (Gross 2008). By the mid-1920s, a road had been constructed to the town, making the shipment of fruit from the numerous groves in the area much easier. A 1926-27 directory lists 48 residents, a school with J. E. Bridgewater as the teacher, and a Community Church with Reverend C. B. Poland as pastor (Parrish et al. 2001:18). By 1930, the Hutzler store was present in Orsino and the 1st through 9th grade Orsino School was taught by Mrs. Lillian Hutzler. On Sundays, the school house also served as a church for visiting pastors (Photo 13) (Carter 1996). In addition to the store, the Hutzler's ran a gas station and the post office (Dean-Masters 2008).

Photo 13. *Orsino Baptist Church, date unknown (from Nolen 2004:64).*

The community of **Heath,** named for the manager of the Dummett Grove property, was located on the east bank of the Indian River, just north of Banana Creek (Shofner 1995:136-137). In 1887, the community had a post office and weekly mail delivery. F. B. Sackett was the postmaster and had an apiary. An 1889 Florida encyclopedia describes Heath as "on the line of the Jacksonville, Tampa, and Key West Railway." Hammock land in the town sold for $15-$50 per acre, and tropical fruits and vegetables were grown successfully. At the time of the publication, the population was 75 and included the Camp brothers, who grew vegetables; M. Bates, a teacher; and eight orange growers (Elliott 1889). At some point, the post office was closed and later reopened in 1891 as **Mortonhurst**, with George W. Morton as postmaster (Shofner 1995:136-137).

William D. Owens purchased property in the area of **Audubon** (Figure 9-7) in 1891, and A. Fortenberry in 1918 (DEP n.d.-k: 80). The Audubon Post Office was established on September 11, 1914, and closed on June 30, 1932 (Parrish et al. 2001:91). The town, said to have been established to honor naturalist John James Audubon, was situated on the west shore of the Banana River. A planing mill was located in the town ca. 1926-27 and Ms. Edith S. Kelley was the postmaster. Fifty-six residents are listed in the directory from the same years (Parrish et al. 2001:90). From 1936 to 1940, the mail was delivered to the community of five or six families by Paul S. Roberts (Roberts 1997). Mr. Roberts became the mail carrier after successfully bidding on the route from outside the state (Harrell 2008). The Audubon Post Office had previously been located in the A. Fortenberry residence. The approximately three-mile road to the town was built by Mr. Fortenberry using a narrow gauge railroad track to carry the marl from a pit to the road bed. The road was completed in 1939. A small school house had been present in the community for a

RELEASED - Printed documents may be obsolete; validate prior to use.

few years and was used as a community center and voting precinct from 1936 to 1940. A dairy, operated by the Curtis family, was also present in the community (Roberts 1997).

A post office was established in the community of **Courtenay** (Figure 9-7) in 1895. John Houston had the mail contract and Milledge B. Sams was the postmaster, in addition to being a dentist. Originally called Island City, an earlier 1885 post office served an estimated 50 people, and the town included a community house, a school, and an Episcopal church. The LaRoche brothers, the Sams family, and E. P. Porcher were early settlers of the community (Shofner 1995:136-137).

The natural resources of the Indian River/Merritt Island area were well-known and attracted many famous individuals. Numerous gun and fishing clubs were established around the turn of the century, including the Indian River Haulover and Outing Club, noted previously, and the Canaveral Club. The Canaveral Club, formed in 1890, was composed entirely of members of the Harvard University class of the same year. Each of the 15 members contributed $5,000, which was used to eventually purchase 18,000 acres of oceanfront and property along Banana Creek. The 22-room clubhouse had a concrete swimming pool, golf course, and stables and hosted dignitaries such as Presidents Benjamin Harrison and Grover Cleveland (Gross 2008; Shofner 1995) (Photos 14 and 15). It is likely that the presence of the club contributed to the construction of the "hump back" bridge across Banana Creek, built to allow boats passage under it (Penders 2008a). The bridge was replaced around 1937 (Nolen 2004:42). Careful records of mammal, fish, fowl, and reptile seen and shot, as well as expenses incurred during the season, were kept in the Canaveral Club ledger. Entries in 1909 included a bear seen on the beach and a notation that "coons or possums are caught almost nightly by the assistant cook in trap over on the beach side" (Anon. 1909).

Photo 14. *Photograph of the Canaveral Club (from Shofner 1995:168).*

RELEASED - Printed documents may be obsolete; validate prior to use.

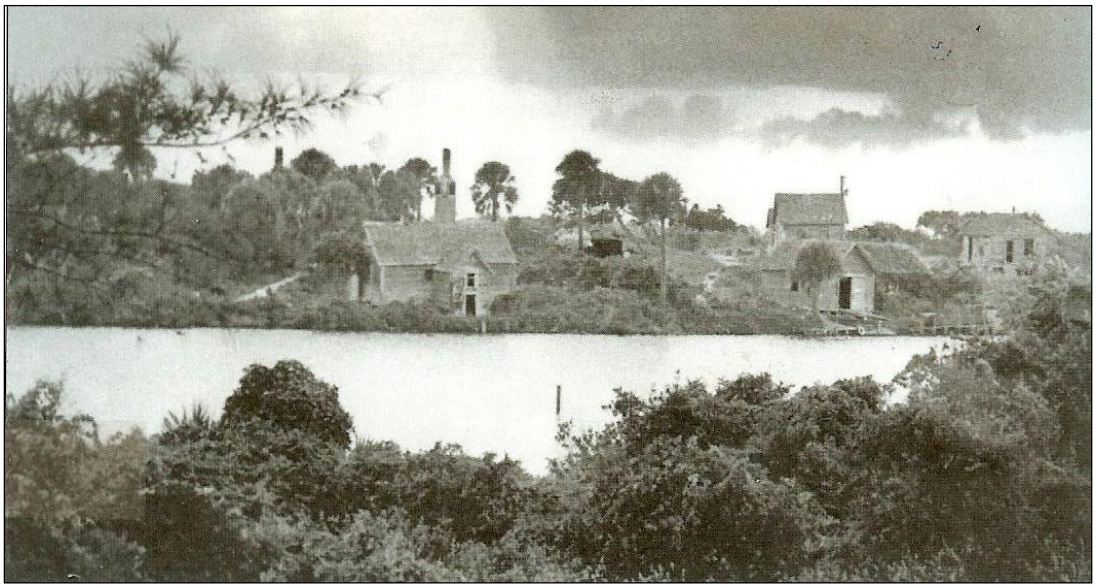


Photo 15. *Photograph of Canaveral Club (from Osborne 2008:18).*

7.0 20TH CENTURY

The turn of the century prompted optimism and excitement over growth and development. With increased financial resources and machinery, extensive reaches of the county's lands were now available for development. In most cases, the land required intensive drainage for agricultural development and settlement. Drainage systems reclaimed for settlement consisted of large sections of swamp land between Melbourne and Vero Beach, and led to an improved road system and an increasing population. Two large developments, Roseland Park and Fellsmere Farms, were started in the 1890s. Both developments were responsible for draining much of the wetlands in Brevard County. Fellsmere Farms, located in the southern part of the county, was one of the largest and most comprehensive privately-funded reclamation projects in Florida. Along with the Indian River Farms Company in Vero Beach and the Palm Beach Farms Company, Fellsmere Farms was responsible for draining large areas of Florida's East Coast (Shofner 1995:241-242).

The first twenty years of the new century witnessed the advent of progressivism in which governments expanded their services beyond traditional limits of the previous century. During this time the automobile, telephone, and electricity transformed Brevard County from isolation into a county linked with the rest of the state and the nation. Two roads significantly opened up the communities along the Indian River: Dixie Highway and Cheney Highway. Dixie Highway, completed through Brevard County in September 1916, eventually linked Chicago and Miami. By late September, newspapers described the tourist traffic as "very brisk" with 50 to 60 automobiles every day (Shofner 1995:227-228). Cheney Highway, today's State Road 50, linked the Indian River area with Orlando. It was started in 1916 and eventually completed in 1925 (Eriksen 1994:168; Shofner 1995:228). In 1916, the American Telephone and Telegraph Company obtained a franchise to operate in Titusville, Miami, and Key West, providing the first significant long distance service (Shofner 1995:229). According to the September 1919 TriCounty Phone Directory of the Brevard County Telephone Company, approximately 36 telephone numbers were listed on Merritt Island, mostly in Courtenay (Brevard County Telephone Company 1919). Around this time, at

RELEASED - Printed documents may be obsolete; validate prior to use.

Orsino, the Blue Hammock Civic Association was advertising for settlers (Shofner 1995:249). In 1917, the first bridge to span the Indian River was constructed. This Cocoa to Merritt Island Bridge, located south of Courtenay, provided a link to numerous communities on Merritt Island and to the "little resort" of Cocoa Beach (Eriksen 1994:153). Thus, by the end of World War I in 1919, Brevard County was prepared for the boom of the 1920s.

The boom, which originated in the 1910s, exploded in the 1920s. By 1920, the county population numbered over 8,500, a 90% increase over the 4,717 residents of 1910. Several sources prompted the boom, including the mild winters, the growing number of tourists, and larger use of the automobile, the completion of roads, the prosperity of the 1920s, and the promise by the state legislature never to pass state income or inheritance taxes. Dixie Highway, now US 1, stretched the length of the East Coast and was rebuilt in Brevard County in 1923. Other improvements included the construction of bridges across the Indian River, which provided easy access to the beaches (Eriksen 1994:164-168). Much of the development in Brevard County during the 1920s occurred in and around Cocoa, then heralded by the Cocoa Tribune as the largest city in Brevard County with a population of 1,445, compared with 1361 residents for Titusville (Eriksen 1994:166). Cocoa was home to the "ultra modern" Aladdin Theatre, the Brevard Hotel, and several new subdivisions. As the boom peaked in 1925, oceanfront casinos became popular (Eriksen 1994:167). A small, temporary casino was built at DeSoto Beach, approximately eight miles north of the Canaveral lighthouse in 1925. The casino, built by a corporation headed by P. E. Studebaker, was intended to draw buyers to the as yet undeveloped resort city. A few years earlier, the Playa Linda Development Corporation had advertised their 8000 quarter acre lots east of Titusville as "the greatest beach development north of Miami" (Eriksen 1994:167).

By 1926-27, the bottom fell out of the Florida real estate market. Massive freight car congestion from hundreds of loaded cars sitting in railroad yards caused the Florida East Coast Railway to embargo all but perishable goods in August of 1925 (Curl 1986:84-84). The embargo spread to other railroads throughout the state, and, as a result, most construction halted. The 1926 real estate economy was based upon such wild land speculation that banks could not keep track of loans or property values (Eriksen 1994:172). By October, rumors were rampant in northern newspapers concerning fraudulent practices in the real estate market in south Florida. To counteract the reports, T. Coleman du Pont, chairman of the Mizner Development Corporation of Palm Beach County, held an open meeting to try and convince the public that the increase in property values represented real worth. However, the next week du Pont and several other board members resigned in a public letter to the *New York Times*. Du Pont brought stability to the Corporation during the development of Boca Raton in Palm Beach County. After the public letter, confidence in the Florida real estate market quickly diminished, investors could not sell lots, and the Great Depression hit Florida earlier than the rest of the nation (Curl 1986:84-84).

To make the situation even worse, two hurricanes hit south Florida in 1926 and 1928. Neither hurricane caused much damage to Brevard County, but destroyed confidence in Florida as a tropical paradise and created a flood of refugees fleeing northward. Soon after, the collapse of the Florida Land Boom, the October 1929 stock market crash, and the onset of the Great Depression left the Brevard area in a state of stagnation. Residents managed to survive on fish, oranges, deer, and turtles. By the mid-1930s, federal programs, implemented by the Roosevelt administration, started employing large numbers of construction workers, helping to revive the economy of the state. The programs were instrumental in the construction of parks, bridges, and public buildings. In Brevard County, some of these projects included the construction of the Melbourne Airport, the Intracoastal Waterway, the repairing of schools, paving roads, and the preparation of detailed maps of the county (Eriksen 1994:181-190).

By 1938, recovery from the Great Depression was imminent with the population of Brevard County approaching 16,000 in 1940, an increase from 13,283 in 1930 (Eriksen 1994:186-189). Development,

RELEASED - Printed documents may be obsolete; validate prior to use.

which would irreversibly alter the county, was beginning. In 1939, Cocoa was described by the Federal Writers' Project as a "citrus shipping center, with groves bordering some of its principal thoroughfares. Orange trees in nearby hammocks have borne fruit, it is said, since 1868" (FWP 1939). The Haulover was described as "a narrow channel dug to connect Mosquito Lagoon with upper Indian River." The description goes on to say that "formerly small schooners were hauled almost a half mile across by use of rollers and skids" (FWP 1939:306).

Two months after Hitler invaded Austria in March 1938, Congress passed the Naval Expansion Act, established the Hepburn Board, and charged it with determining sites for future naval expansion. In March 1939, the Board chose the peninsula below Cocoa Beach as the site for the Banana River Naval Air Station. The Federal Government acquired approximately 1,900 acres and land owners received around $58.00 per acre. (Eriksen 1994:191). With the new air station, improved roadways and bridges became top priority for Brevard County. The base opened in 1940, and the first plane landed in 1941. The incoming servicemen renewed the area economy and the same year a new concrete bridge and causeway was completed, connecting Cocoa to Merritt Island over the Banana River (Eriksen 1994:193). One of the main tasks of the Banana River Station personnel was to patrol for German submarine activity along the coast (Parker 2002). In 1942, a Navy scouting squadron was assigned to act as an airborne escort service to ships in the nearby shipping lanes. They were to function as a defensive measure against the German U-boat attacks that had been taking place along the coast. In addition, several small airstrips were constructed throughout the county, beach patrols were established with orders to shoot any suspicious characters seen on the beach at night, and occasional blackouts took place along the coast. During 1942, the Federal Government spent $8 million on defense-related projects in Brevard County (Eriksen 1994:190-196). When the war ended in 1945, the population of the county numbered 19,000, not including 500 military personnel (Eriksen 1994:200).

As World War II ended, the military presence in the county decreased. Bases were generally closed or maintained by the skeleton crew. The Banana River Naval Air Station was deactivated as a Navy support base in August 1947, and subsequently transferred in September 1948, from the Navy to the Air Force (Eriksen 1994:205). Following a series of name changes, the former Banana River Naval Air Station became Patrick Air Force Base (PAFB) in August of 1950.

The post-war development of Brevard County is similar to that of the rest of America: increasing numbers of automobiles and asphalt, an interstate highway system, suburban sprawl, and strip development along major state highways. The county, like most of Florida, experienced a population boom in the 1950s. While Florida's population increased from 1,897,414 in 1949 to 2,771,305 in 1950, the number of Brevard County residents increased by over 10,000 between 1940 and 1950 (Tebeau 1980:431; Eriksen 1994:200, 228). Many who had served at Florida's military bases during World War II returned with their families to live. As veterans returned, the trend in new housing focused on the development of small tract homes in new subdivisions. In Brevard County, many of these subdivisions were built on dredged lands (Eriksen 1994:213-214).

When President Kennedy initiated the Man-to-the-Moon project, new land was required to support the expanded launch structures. Merritt Island, a relatively undeveloped area west and north of Cape Canaveral, was selected for acquisition, and in 1961, the Merritt Island Launch Area (MILA) was established (NASA 1992:3.1). In 1962, NASA KSC was authorized by Congress to purchase 125 square miles of property. The U.S. Army Corps of Engineers acted as agent for purchasing land, which took place between 1962 and 1964. NASA KSC began gaining title to the land in late 1962, taking over 83,900 acres by outright purchase. The purchase of land included the towns of Orsino, Wilson, Heath, and Audubon, and many farms, citrus groves, and several fish camps (Shofner 1995:169). Also included were several subdivisions, including Allenhurst, Atlantic Beach Heights, Haulover Heights No. 1 and 2, Myrtle

RELEASED - Printed documents may be obsolete; validate prior to use.

Park Shoals, North Indian River Shores, Satellite Estates, and South Indian River Shores. In many instances, the subdivisions had not yet been developed (Unknown n.d.). Some of the buildings were moved at NASA's expense to new locations, while others were abandoned in place; a few dozen buildings were given to the Brevard County schools to be used as temporary classrooms and others were utilized by NASA KSC (Shofner 1996:169). In 1963, sand from the bottom of the Banana River was dredged and used to build a causeway between today's KSC and the mainland. Now called the NASA Causeway, construction was completed in 1966 (Shofner 1995:196).

The American program to put a man in space and land on the Moon now proceeded rapidly. The Manned Space Program, initiated in 1958, was executed in less than five years. In 1964, Project Gemini was the intermediate step toward achieving a manned lunar landing, bridging the gap between the short-duration Mercury flights and the long-duration mission proposed for the Apollo Program (Butowsky 1981:5). In 1969, an estimated 500,000 saw the Apollo 11 mission liftoff, which was the culmination of the Apollo lunar landing program (Anon. 1994:89-90). This increased exposure of the Brevard County area through the use of televised lift-offs increased tourism to the area. The space race also demanded civilian and military personnel to work at the installation and at the technological industries created to support KSC. By the late 1960s, at the peak of the Apollo Program, Brevard County relied heavily upon space-related employment. This reliance created an acute problem when the county underwent a recession in the early 1970s. In addition, many KSC, CCAFS, and related industry workers lost their jobs at the conclusion of the Apollo Program (Tebeau 1980:464). The economy eventually stabilized by the late 1970s and continued to diversify in the 1980s, relying on increased industry and tourism (Stone 1988). In 1983, KSC increased its holdings when the Florida East Coast (FEC) Railway requested a buy-out of its property east of Titusville, including the Jay-Jay rail yard. NASA acquired 74.9 ha (185.1 ac) as the result of this purchase.

In 1993, Brevard County had a population of 427,035, making the county the ninth largest in the state (Purdum 1994:10). In 2006, the population was estimated to be over 534,000, a more than 12% increase since 2000 (USCB 2008).

RELEASED - Printed documents may be obsolete; validate prior to use.

8.0 REFERENCES CITED

Archaeological Consultants, Inc. (ACI). Archaeological Survey to Establish Zones of Archaeological Potential (ZAPs) in the VAB and Industrial Areas of the Kennedy Space Center. Sarasota, Florida: ACI. 1990.

ACI. Archaeological Survey to Establish Zones of Archaeological Potential (ZAPs) in the Launch Complex Area (Option 1) of the Kennedy Space Center. Sarasota, Florida: ACI. 1991.

ACI. Archaeological Survey to Establish Zones of Archaeological Potential (ZAPs) in the KSC North Area (Option 3) of the Kennedy Space Center. Sarasota, Florida: ACI. 1992a.

ACI. Archaeological Survey to Establish Zones of Archaeological Potential (ZAPs) in the Shuttle Landing and KSC South Area (Option 2) of the Kennedy Space Center. Sarasota, Florida: ACI. 1992b.

ACI. Archaeological Survey to Establish Zones of Archaeological Potential in the KSC North Area (East of State Road 3) (Basic Contract Area) of the Kennedy Space Center. Sarasota, Florida: ACI. 1996.

Andrews, Evangeline Walker and Charles McLean Andrews. *Jonathan Dickinson's Journal*. Stuart, Florida: Southeastern Printing Company. 1975.

Anon. Canaveral Club Ledger. Cocoa, Florida: Florida Historical Society. 1909.

Anon. *Facts: John F. Kennedy Space Center*. 1994.

Barbour, George M. *Florida for Tourists, Invalids, and Settlers*. New York: Appleton and Company. 1884.

Bradbury, Alford G. and E. Storey Hallock. *A Chronology of Florida Post Offices. Handbook 2*. The Florida Federation of Stamp Clubs. 1962.

Brevard County Telephone Company. TriCounty Phone Directory of the Brevard County Telephone Company. Cocoa, Titusville, Melbourne, New Smyrna, Ft. Pierce, Jensen and Vero Exchanges. On file, Florida Historical Society, Cocoa. 1919.

Brewer, David M. *An Archaeological and Ethnohistorical Overview of Mosquito Lagoon at Canaveral National Seashore*. M.S. Thesis, Department of Anthropology, Florida State University, Tallahassee. 1991.

Brewer, David M. and Elizabeth A. Horvath. In Search of Lost Frenchmen: Report on the 1990 and 1995 Archaeological Investigations at the Oyster Bay Site (CANA-73 / 8VO3128), Canaveral National Seashore, Volusia County, Florida. Tallahassee: Southeast Archeological Center, National Park Service, Tallahassee. 2004.

Bullen, Ripley P., Adelaide K. Bullen, and William J. Bryant. Archaeological Investigations at Ross Hammock Site, Florida. *American Studies Report* 7. Orlando, Florida: The William L. Bryant Foundation. 1967.

RELEASED - Printed documents may be obsolete; validate prior to use.

Butowsky, Harry A. Reconnaissance Survey: Man in Space. Washington, D.C.: U.S. Department of the Interior, National Park Service. 1981.

Butts, Jim. Personal communication to Joan Deming and Christine Newman. 2008.

Carter, Edwina Christie. Orsino School. *The Way it Was.* Cocoa, Florida: Central Brevard Mosquito Beaters. 1996.

Clegg, John A. *The History of Flagler County*. Privately printed. 1976.

Cleveland, Weona. "History of a Black Community." *Melbourne Times,* 1b, February 2, 1983.

Covington, James W. "The Armed Occupation Act of 1842." *Florida Historical Quarterly* 40: 41-53. 1961.

Covington, James W. *The Billy Bowlegs War 1855-1858: The Final Stand of the Seminoles Against the Whites*. Chuluota, Florida: The Mickler House Publishers. 1982.

Curl, Donald W. P*alm Beach County: An Illustrated History*. Northridge, California: Windsor Publications, 1986.

Dean-Masters, Ina L. The Old Things of Brevard. In *Mosquito Beaters Memory Book*. Cocoa, Florida: Central Brevard Mosquito Beaters. 2008.

Dunn, Hampton. *Back Home: A History of Citrus County, Florida*. 2nd edition. Inverness, Florida: Citrus County Historical Society. 1989.

Dunn, Major B.C. *Intracoastal Waterway, Fernandina to Miami Florida*. Jacksonville, Florida: U.S. Engineers Office. 1934.

Elliott, E. J. *Elliott's Florida Encyclopedia*. Jacksonville, Florida: E.J. Elliott. 1889.

Eriksen, John M. *Brevard County, A History to 1955*. Tampa, Florida: Florida Historical Society Press. 1994.

Florida Department of Natural Resources. *Cattle Dipping Vats in Florida*. Florida Department of Natural Resources. www.dep.state.fl.us/waste/quick_topics/publications/wc/cattlevats.pdf. July 2008.

Florida Memory Project. *The Eclectic Docked on the Indian River*. Florida Photographic Collection, State Library and Archives of Florida, http://ibistro.dos.state.fl.us/uhtbin/cgisirsi.exe/x/x/o/5?libraryv_PHOTO&item type+PHO. 2007.

Foster, Roz. The Clifton Colored School. *The Indian River Journal*, Volume 5(1):16-17. 2006.

Foster, Roz. Atlantic Coast, St. Johns and Indian River Railroad. *Historical Society of North Brevard, Inc.*: http://www.nbbd.com. 2007.

Foster, Roz. *The Clifton Colored School Circa 1890*. Historical Society of North Brevard, Inc. http://www.nbbd.com/godo/history/CliftonSchool/index.html. 2008.

RELEASED - Printed documents may be obsolete; validate prior to use.

Federal Works Program (FWP). *Florida: A Guide to the Southernmost State*. Federal Writers Project. New York: Oxford University Press. 1939.

Griffin, John W. and James J. Miller. Cultural Resource Reconnaissance of Merritt Island National Wildlife Refuge. Tallahassee, Florida: Cultural Resource Management, Inc. 1978.

Gross, Bob. Personal communication to Christine Newman. Cocoa, Florida: Florida Historical Society. January 8, 2008.

Harrell, George Leland "Speedy." Personal communication to Christine Newman. Cocoa, Florida: Florida Historical Society. January 8, 2008.

Hellier, Walter R. *Indian River, Florida's Treasure Coast*. Coconut Grove, Florida: Hurricane House, Publishers, Inc. 1965.

Henshall, James A. *Camping and Cruising in Florida*. Cincinnati, Ohio: R. Clarke and Company. 1884.

Historic Property Associates, Inc. (HPA). Historic Properties Survey of Titusville, Florida. Titusville, Florida: Historic Property Associates, Inc. 1987.

Historical Society of North Brevard. *North Brevard Historical Museum Website*. Historical Society of North Brevard, Inc. http://www.nbbd.com/godo/history/ 2008.

Historic St. Augustine Preservation Board (HSAPB). Historic Properties Survey of St. Johns County, Florida. St. Augustine, Florida: Historic St. Augustine Preservation Board. 1985.

Holzman, Douglas. Correspondence between Joan Deming and Douglas Holzman. Sarasota, Florida: ACI. 2003.

Kjerulff, Georgiana Greene. *Tales of Old Brevard*. Melbourne, Florida: Kellersberger Fund of the South Brevard Historical Society, Inc. 1972.

LeBaron, J. Francis. Prehistoric Remains in Florida. *Smithsonian Institution Annual Report* 1882: 771-790. 1884.

Lewis, John and Samuel Lewis. Plan of Part of the Coast of East Florida Including St. Johns River from an Actual Survey by Wm. Gerard de Brahm, Esq., Surveyor General of the Southern District of North America. Map on file, St. Augustine Historical Society, St. Augustine. 1769.

Lincoln, Robert T. Letter from the Secretary of War. Copy of Report from Lieut. Col. Q.A. Gillmore, Corps of Engineers, Upon a Survey of Indian River, Florida, with A View to Opening a Passage to Mosquito Lagoon, by Way of the Haulover. Cocoa, Florida: Brevard County Historical Commission. 1882.

Lyon, Eugene. *The Enterprise of Florida*. 1983 reprint. Gainesville, Florida: University Press of Florida. 1976.

Mahon, John K. *History of the Second Seminole War 1835-1842*. Gainesville, Florida: University Press of Florida. 1967.

RELEASED - Printed documents may be obsolete; validate prior to use.

Milanich, Jerald T. *Florida Indians and the Invasion from Europe*. Gainesville, Florida: University Press of Florida. 1995.

Milanich, Jerald T. and Charles H. Fairbanks. *Florida Archaeology*. Gainesville, Florida: University Press of Florida. 1980.

Moore, Dorothy L. Personal communication to Christine Newman. July 21, 2008a.

Moore, Dorothy L. Search for South End of the British Eighteenth Century Kings Road and Location of William Elliot's Eighteenth Century Plantation, Stobbs Farm. On file, ACI, St. Augustine. 2008b.

Morris, Allen. *The Florida Handbook 1985-1986*. Tallahassee, Florida: Peninsular Publications, Co. 1986.

Mote, James D. Historic Resource Study, Status Report, Canaveral National Seashore, Florida. Denver, Colorado: National Park Service. 1977.

National Aeronautics and Space Administration (NASA). *Master Plan: John F. Kennedy Space Center*. 1992.

NASA. *American's Spaceport: John F. Kennedy Space Center*. n.d.

Nolen, Bail Briggs, Ed. *Memories of Merritt Island, Birthplace of Kennedy Space Center*. Sylva, North Carolina: Ammons Communications. 2004.

Olausen, Stephen A. Historic Building Survey of Merritt Island, Florida. St. Augustine, Florida: Historic Property Associates, Inc. 1991.

Osborne, Ray. *Images of America, Cape Canaveral*. Charleston, South Carolina: Arcadia Publishing. 2008.

Parker, Susan R. Canaveral National Seashore, Historic Resources Study, Draft. Manuscript in possession of author. 2002.

Parrish, Ada Edminston, A. Clyde Field, and George Leland "Speedy" Harrell. *Merritt Island and Cocoa Beach, Images of America*. Charleston, South Carolina: Arcadia Publishing. 2001.

Paterno, David. Fort Ann and the Second Seminole War. *The Indian River Journal*, Volume II (1): 11-15. 2003.

Penders, Thomas. Phone and personal interview with Christine Newman. 2008a.

Penders, Thomas. A Cultural Resources Assessment Survey of the Clifton Schoolhouse, Brevard County, Florida. Titusville: Florida: Indian River Anthropological Society. 2008b.

Purdum, Elizabeth D., Ed. *Florida County Atlas and Municipal Fact Book*. Tallahassee, Florida: Institute of Science and Public Affairs, Florida State University. 1994.

Roberts, Paul S. Audubon, Florida. *The Way it Was*. Cocoa, Florida: Central Brevard Mosquito Beaters. 1997.

RELEASED - Printed documents may be obsolete; validate prior to use.

Rouse, Irving. A Survey of Indian River Archaeology, Florida. *Yale University Publications in Anthropology* 44. Yale University Press, New Haven. 1981 Reprint, New York: AMS Press, Inc. 1951.

Schafer, Daniel L. St. Augustine's British Years: 1763-1884. *El Escribano* 38. 2001.

Schafer, Daniel L. *New World in a State of Nature: British East Florida*. Department of History, University of North Florida, floridahistoryonline.com. 2008.

Schwadron, Margo. Personal Communication to Christine Newman. 2008a.

Schwadron, Margo. "Preliminary Results of Phase I Survey of the Elliot Point Plantation." Personal Communication to Beth Horvath. 2008b.

Shofner, Jerrell H. *History of Brevard County*, Volume 1. Stuart, Florida: Brevard County Historical Commission. 1995.

Shofner, Jerrell H. *History of Brevard County*, Volume 2. Stuart, Florida: Brevard County Historical Commission. 1996.

Siebert, Wilbur H. *Loyalists in East Florida, 1774 to 1785*, 2 vols. Deland, Florida: Florida State Historical Society. 1929.

State of Florida, Department of Environmental Protection (DEP). Field Notes, T22S, R35E. Volume 78. 1843a.

DEP. Field Notes, T22S, R36E. Volume 78. 1843b.

DEP. Field Notes, T22S, R37E. Volume 78. 1843c.

DEP. Field Notes, T23S, R36E. Volume 78. 1843d.

DEP. Field Notes, T19S, R35E. Volume 92. 1844a.

DEP. Field Notes, T19S, R36E. Volume 92. 1844b.

DEP. Field Notes, T20S, R35E. Volume 92. 1844c.

DEP. Field Notes, T20S, R36E. Volume 92. 1844d.

DEP. Field Notes, T21S, R36E. Volume 92. 1844e.

DEP. Field Notes, T21S, R35E. Volume 92. 1844f.

DEP. Field Notes, T21S, R37E. Volume 92. 1844g.

DEP. Field Notes, T22S, R26E. Volume 92. 1844h.

DEP. Field Notes, T22S, R35E. Volume 92. 1844i.

RELEASED - Printed documents may be obsolete; validate prior to use.

DEP. Field Notes, T22S, R37E. Volume 92. 1844j.

DEP. Plat Map, T21S, R35E. 1845.

DEP. Plat Map, T21S, R35E. 1846.

DEP. Plat Map, T20S, R36E. 1848.

DEP. Field Notes, T19S, R35E. Volume 185. 1850.

DEP. Plat Map, T19S, R35E. 1852a.

DEP. Plat Map, T20S, R35E. 1852b.

DEP. Plat Map, T23S, R37E. 1859.

DEP. Field Notes, T21S, R35E. Volume 212. 1860a.

DEP. Field Notes, T21S, R36E. Volume 212. 1860b.

DEP. Field Notes, T21S, R37E. Volume 212. 1860c.

DEP. Field Notes, T22S, R35E. Volume 212. 1860d.

DEP. Field Notes, T22S, R36E. Volume 212. 1860e.

DEP. Field Notes, T22S, R37E. Volume 212. 1860f.

DEP. Field Notes, T23S, R36E. Volume 212. 1860g.

DEP. Field Notes, T20S, R36E, Volume 241. 1880.

DEP. Plat Map, T22S, R37E. 1953.

DEP. Tract Book, T19S, R35E. n.d.-a.

DEP. Tract Book, T19S, R36E. n.d.-b.

DEP. Tract Book, T20S, R35E. n.d.-c.

DEP. Tract Book, T21S, R35E. n.d.-d.

DEP. Tract Book, T21S, R36E. n.d.-e.

DEP. Tract Book, T21S, R37E. n.d.-f.

DEP. Tract Book, T22S, R35E. n.d.-g.

DEP. Tract Book, T22S, R36E. n.d.-h.

RELEASED - Printed documents may be obsolete; validate prior to use.

DEP. Tract Book, T22S, R37E. n.d.-i.

DEP. Tract Book, T23S, R36E. n.d.-j.

DEP. Tract Book, T23S, R37E. n.d.-k.

Stone, Elaine Murray. *Brevard County: From Cape of the Canes to Space Coast*. Windsor Publications, Inc. 1988.

Taylor, Walter Kingsley and Elaine M. Norman. *Andre Michaux in Florida: An Eighteenth-Century Botanical Journey*. Gainesville, Florida: University of Florida Press. 2002.

Tebeau, Charlton W. *Florida's Last Frontier: The History of Collier County*. Coral Gables, Florida: University of Miami Press 1966.

Tebeau, Charlton W. *A History of Florida*. Coral Gables, Florida: University of Miami Press. 1971.

Tebeau, Charlton W. *A History of Florida*. Revised Edition. Coral Gables, Florida: University of Miami Press. 1980.

Thompson, Dana. Personal communication to Christine Newman. 2008a.

Thompson, Dana. Personal files, family histories, and photographs. New Smyrna Beach. 2008b

United States Air Force (USAF). M*anned Lunar Landing Program Area Mosaic*. St Louis, Missouri: USAF Aeronautical Chart and Information Center. 1962.

United States Census Bureau (USCB). *1900 United States Federal Census*. www.Ancestry.com.

USCB. *1910 United States Federal Census*. www.Ancestry.com.

USCB. *1920 United States Federal Census*. www.Ancestry.com.

USCB. *1930 United States Federal Census*. www.Ancestry.com.

USCB. *Census 2000.* http://quickfacts.census.gov/qfd/states/12/12009.html.

United States Coast Guard (USCG). *Chester Shoal House of Refuge, Florida*. www.uscg.mil/history/STATIONS?CHESTER%20SHOAL.html. 2008.

United States Department of Commerce (USDC). *Coast and Geodetic Survey, Ponce de Leon Inlet to Cape Canaveral*. Washington, D.C. 1931.

United States Geological Survey (USGS). *Courtenay, Fla.* 1949a.

USGS. *False Cape, Fla*. 1949b.

USGS. *Mims, Fla.* PR 1970, PI 1989. 1949c.

USGS. *Mims, Fla.* 1949d.

RELEASED - Printed documents may be obsolete; validate prior to use.

USGS. *Oak Hill, Fl.* 1949e.

USGS. *Oak Hill, Fla.* PR 1970, MR 1992. 1949f.

USGS. *Orsino, Fla.* 1949g.

USGS. *Titusville, Fla*. PR 1988. 1949h.

USGS. *Wilson, Fla.* PR 1979. 1949i.

USGS. *Wilson, Fla.* 1949j.

USGS. *Ariel, Fla.* PR 1970. 1950.

USGS. *Courtenay, Fla.* 1976a.

USGS. *False Cape, Fla.* PI 1984. 1976b.

USGS. *Orsino, Fla.* 1976c.

Unknown. An 1879 Itinerary from St. Augustine to Miami. *Florida Historical Quarterly* 18(3):205-216. 1940.

Unknown. The Taylor Family of Shiloh and North Merritt Island Including Family Profiles of Kuhl, Griffis, Pattillo, Kuebler, and Defries. Dated 1925. *The Indian River Journal* 6(2): 17-27. 2007.

Unknown. Real Estate Planning Report, Expansion, Cape Canaveral, Missile Test Center Annex, Brevard and Volusia Counties, Florida. Manuscript on file, ACI, Sarasota. n.d.

Voss, Gilbert L. The Orange Grove House of Refuge No. 3. *Tequesta* 28: 3-17. 1968.

RELEASED - Printed documents may be obsolete; validate prior to use.

APPENDIX B-3: The Space Age Context

1.0 INTRODUCTION

In October 1949, President Harry S. Truman established the Joint Long Range Proving Ground (currently known as the Air Force Eastern Test Range), a vast overwater military rocket test range that now extends over 8,047 kilometers (km) (5,000 miles [mi]) down the Atlantic Coast from CCAFS to Ascension Island (NASA n.d.:5). CCAFS was ideal for testing missiles. Virtually uninhabited, it enabled personnel to inspect, fuel, and launch missiles without danger to nearby communities. The area's climate also permitted year-round operations. The first launch from CCAFS, conducted by a military-civilian team on July 24, 1950, was of a modified German V-2 rocket with an attached upper stage. Facilities for both intercontinental ballistic missiles (ICBMs) and intermediate range ballistic missiles (IRBMs) were constructed at Cape Canaveral. Throughout the early and mid-1950s, the focus of activities remained on missile development for defense against the Soviets.

In 1955, President Eisenhower announced that the United States would launch an unmanned satellite as part of the nation's participation in the International Geophysical Year, which extended from July 1957 through December 1958. When the Soviets launched the satellite Sputnik I in October of 1957, public attention turned to space exploration. The following month, the Soviets placed the Sputnik II satellite carrying a dog into orbit around the Earth. The launch caused a furor among Americans, who feared that the U.S. was losing the "space race." The President initially assigned responsibility for the U.S. Space Program to the Department of Defense. Explorer I, America's first scientific satellite, was launched on January 31, 1958, from CCAFS, by a military-civilian team of the Army's Missile Firing Laboratory (MFL). This group, under the direction of Kurt H. Debus, a key member of the famed Dr. Wernher von Braun rocket team, later formed the nucleus of KSC (NASA n.d.:6).

Realizing that the military's involvement in the space program would jeopardize the goal of using space for peaceful purposes, the President's Science Advisory Committee urged that a centralized agency be created to oversee the scientific exploration of space. On October 1, 1958, the new civilian agency, the National Aeronautics and Space Administration, was formed with the mission of carrying out scientific aeronautical and space exploration, both manned and unmanned. The Department of Defense, especially the Air Force, would continue with defense-related missile and satellite development. Soon after the creation of NASA, the California Institute of Technology's Jet Propulsion Laboratory, affiliated with the Army, was transferred to NASA. Also, President Eisenhower officially transferred a large portion of the Army's Development Operations Division, with the team led by von Braun, to NASA in March 1960. The President named the Huntsville, Alabama, NASA installation the Marshall Space Flight Center and designated the MFL at Cape Canaveral as the Launch Operations Directorate (LOD) of NASA. The LOD, led by Dr. Debus, managed the overall integration, testing, and launch operations of NASA (Benson and Faherty 2001:15). Several Army facilities plus various offices and hangars at CCAFS were transferred to NASA, including Launch Complexes (LC) 5, 6, 26, and 34.

One of NASA's first goals was to put a man in orbit around the Earth. At its creation, the Air Force's manned space projects were transferred to NASA, which NASA combined under the name Project Mercury in 1958. NASA selected the first seven astronauts for the Manned Space Program in April 1959. The goals of Project Mercury included sending a man into space to orbit the Earth, testing his ability to

RELEASED - Printed documents may be obsolete; validate prior to use.

perform in a weightless environment, and recovering both man and capsule (Spires 1998:39). The program included two manned suborbital flights powered by a modified Redstone missile and four manned orbital flights powered by an Atlas missile topped by the Mercury capsule. The first suborbital flight occurred on January 31, 1961, with the launch of Ham, a chimpanzee. The U.S. was upstaged when the Soviet Union launched Vostock I with cosmonaut Uri Gagarin to orbit the Earth in April 1961. The launch of Alan Shepard the following month on a Mercury suborbital flight proved anticlimactic (Butowsky 1981:4).

Realizing the impact of the Soviet advancements on the American psyche, President John F. Kennedy appointed Vice President Lyndon Johnson, in cooperation with representatives from NASA and the associated industries, to develop a space program that would surpass the Soviet program. The panel recommended a 10-year phased approach, which would include manned space flight, planetary exploration, and the development of new rockets and satellites. Accepting the recommendations, on May 25, 1961, President Kennedy proposed the following historic goal before a joint session of Congress:

> *Now is the time to take longer strides--time for a great new American enterprise, time for this nation to take a clearly leading role in space achievement, which in many ways may hold the key to our future on Earth...I believe this nation should commit itself to achieving the goal, before this decade is out, of landing a man on the Moon and returning him safely to the Earth. No single space project in this period will be more impressive to mankind, or more important for the long-range exploration of space, and none will be so difficult or expensive to accomplish* (Butowsky 1981:4).

With widespread support, the public and Congress embraced the goal and the program proceeded rapidly. Circling the Earth three times, John Glenn completed the first manned orbital flight of the United States on February 20, 1962, in a capsule propelled by an Atlas rocket from LC-14 at CCAFS. Followed by three more manned orbital flights, the Mercury Program concluded as a success on May 15, 1963.

NASA initiated planning for Project Gemini in late 1961 as the intermediate step in sending a man to the moon. Officially announced in 1962, the project was operational by 1964. The goals of Project Gemini included testing man's performance during extended periods in space, both within and outside of the spacecraft, development of rendezvous and docking techniques, and perfection of controlled reentry and landing techniques. The larger, more maneuverable capsule, designed to hold two men, was propelled by a Titan II rocket. Following the first unmanned Gemini launch on April 8, 1964, Gemini 3 was the first manned flight of the program in March 1965. Gemini 12, launched in November 1966, successfully completed the program.

2.0 PROJECT MERCURY: 1958-1963

Project Mercury was NASA's first manned spaceflight program and was active from December 1958 through May 1963. The goals of the project were to "(1) Place a manned spacecraft in orbital flight around the Earth. (2) Investigate man's performance capabilities and his ability to function in the environment of space. (3) Recover the man and the spacecraft safely" (Williams, et al. 1963:2). Over the course of Project Mercury, NASA successfully designed a vehicle that could survive the conditions of space, as well as atmospheric reentry; hired and trained the first U.S. astronauts; developed a worldwide tracking network; created mission control procedures that became the protocol for all future programs; and launched twenty-six missions (manned and unmanned) between August 1959 and May 1963.

All twenty-six missions launched as part of Project Mercury occurred between August 1959 and May 1963. Each of these flights fell into one of three mission categories: research and development,

RELEASED - Printed documents may be obsolete; validate prior to use.

qualification, or manned. Of the twenty-six missions, seven were considered research and development, thirteen were classified as qualification, and six were manned flights. Nine missions from the research and development and qualification categories lifted off from Wallops Island, Virginia; the remaining seventeen missions, including all of the manned flights, launched from CCAFS. Two research and development flights, Little Joe (LJ)-1B on January 21, 1960, and LJ-6 on October 4, 1959, carried rhesus monkeys, "Miss Sam" and "Sam," respectively. Mercury-Redstone (MR)-2, a qualification flight, carried a chimpanzee named "Ham" to study how a human would perform in space and the effects of spaceflight on humans.

Of the six manned missions in Project Mercury, the first two were suborbital ballistic flights. On May 5, 1961, Alan Shepard became the first American in space with the launch of mission MR-3 from Pad 5 at LC-5/6. His 15.5-minute flight successively met the mission objectives of (1) launching a man into space, and (2) determining his capabilities in a zero-G environment (Grimwood 1963; Swenson, et al. 1966). On July 21, 1961, Virgil "Gus" Grissom became the second American in space with his flight, MR-4. Originally scheduled to launch on July 16, weather postponed the flight, and on July 19, NASA experienced its first scrubbed mission, i.e., the first time an astronaut was in his capsule poised for flight when it got cancelled. When it successfully launched, Grissom's flight lasted just over 15.5 minutes and proved to be a successful repeat of Shepard's. Unfortunately, as Grissom was awaiting the recovery forces, the capsule's explosive hatch blew and the capsule took on water and eventually sank; Grissom was successfully rescued by a second helicopter (Grimwood 1963; Swenson, et al. 1966).

The other four manned missions were orbital flights. On February 20, 1962, John Glenn became the first American to orbit the Earth in his spacecraft. His flight, designated MA-6, launched from LC-14, with the objectives of: placing a man in orbit, observing his actions in a zero-G environment, and bringing him home safely. Glenn orbited the Earth three times for a distance of 75,679 statute miles. MA-7, launched May 24, 1962 and crewed by Scott Carpenter, essentially was a repeat of Glenn's flight with additional scientific experimentations performed during orbit. The next mission was MA-8, which flew on October 3, 1962, carrying Wally Schirra. Schirra orbited the Earth six times, traveling for a total distance of 143,983 statute miles and a total duration of just over nine hours. Project Mercury ended with MA-9, the 34-hour flight of L. Gordon Cooper. Launched on May 15, 1963, Cooper orbited the Earth twenty-two times and became the first American to sleep in space (Grimwood 1963; Swenson, et al. 1966).

3.0 PROJECT GEMINI: 1959-1966

Project Gemini unofficially got its start in May 1959, when NASA Headquarters' Research Steering Committee for Manned Space Flight, commonly known as the Goett Committee after its leader Harry Goett, met for the first time to examine follow-up programs for Project Mercury (Grimwood and Hacker 1969; Brooks, et al. 2009). Initial ideas included a two-man capsule, extended duration flights (up to two weeks), a manned lunar expedition, and a manned orbiting laboratory. Although lunar exploration became the major focus, the Goett Committee noted that there should be an intermediate step between Project Mercury and a lunar mission (Hacker and Grimwood 1977). By the time Project Gemini officially was announced in December 1961, it had become the intermediate step between Project Mercury and the Apollo Program (Grimwood and Hacker 1969).

As the intermediate step between Project Mercury and the Apollo Program, the primary objective of Project Gemini was to prepare for a lunar landing. Its established goals were to keep a two-man crew in space for up to fourteen days; rendezvous and dock with orbiting vehicles and maneuver the combination; and to perfect methods of entering the atmosphere and landing (NASA KSC 2000). In addition, NASA desired to gain more information on the effects of weightlessness on humans; and the Flight Operations Division planned on honing new skills in mission planning and control.

RELEASED - Printed documents may be obsolete; validate prior to use.

Altogether, Project Gemini flew twelve missions, all of which launched from LC 19 at CCAFS. The first two missions were unmanned development flights. The focus of Gemini I, launched April 8, 1964, was to prove that the Titan II could successfully launch the Gemini spacecraft and put it in orbit (Hacker and Grimwood 1977). Gemini II, which occurred on January 19, 1965, had as its major objectives demonstrating the adequacy of the spacecraft reentry module's heat protection, the structural integrity of the spacecraft from liftoff through reentry, and the satisfactory performance of spacecraft systems (Grimwood and Hacker 1969).

The first manned mission, Gemini III, occurred on March 23, 1965, with astronauts Virgil I. "Gus" Grissom as command pilot and John W. Young as pilot. This three-orbit mission focused on testing the maneuverability of the spacecraft, as Grissom and Young changed the shape of their orbit, shifted from their orbital plane, and dropped to a lower altitude by firing the vehicle's thrusters (Grimwood and Hacker 1969). The launch of Gemini IV on June 3, 1965, marked the beginning of the first four-day flight of the U.S. Manned Space Program. Initially, the astronauts, James A. McDivitt and Edward H. White II, were to fly in formation with the second stage of the Titan II booster after separation. The attempt was unsuccessful, as the astronauts proved that the intended method, aiming the thrusters towards the target, would not work. However, during the mission, White successfully completed the first extravehicular activity (EVA), or spacewalk, by an American.

Gemini V, launched August 21, 1965, was an eight-day mission conducted by L. Gordon Cooper, Jr. and Charles "Pete" Conrad, Jr. Scheduled to perform a practice rendezvous with a "pod," electrical problems forced a cancellation of the experiment. Instead, Cooper and Conrad maneuvered the vehicle to a predetermined position, in effect completing a "phantom rendezvous" (Grimwood and Hacker 1969). The goal of Gemini VI, scheduled to launch in October 1965, was to be the first rendezvous and docking mission of the program. The mission plan called for the launch of an unmanned Agena target vehicle by an Atlas rocket, followed by the launch of the manned Gemini vehicle. The astronauts, Walter M. Schirra, Jr. and Thomas P. Stafford, Jr., would catch up to the Agena target from a lower orbit and then manipulate their vehicle for rendezvous. On October 25, 1965, the Agena/Atlas combination was launched from LC 14 at CCAFS; however, shortly afterwards, mission control lost all telemetry signals from Agena and cancelled the launch of Gemini VI. Although the mission was considered a failure, three days later with the approval of the White House, NASA announced that the mission would be redesignated Gemini VI-A and would rendezvous with another manned vehicle, Gemini VII (Grimwood and Hacker 1969; Hacker and Grimwood 1977).

On December 4, 1965, Gemini VII launched with astronauts Frank Borman and James A. Lovell, Jr. for a fourteen-day mission, meant to solve problems of long-duration spaceflight. For eleven days, Borman and Lovell performed various in-flight experiments, including the evaluation of a new, lightweight spacesuit. On December 15, Gemini VI-A launched from CCAFS and proceeded to track down the orbiting Gemini VII vehicle. Rendezvous was completed that afternoon, when Schirra piloted his capsule to within 1 foot of the other, and the two flew in formation around each other for five hours. Gemini VI-A landed on December 16, followed two days later by Gemini VII (Grimwood and Hacker 1969).

Gemini VIII, with astronauts Neil A. Armstrong and David R. Scott, launched on March 16, 1966; less than six hours after launch, it became the first vehicle to rendezvous and dock to a prelaunched Agena target vehicle. Unfortunately, one of Gemini's thrusters became stuck causing the docked vehicles to roll continuously. Armstrong undocked his vehicle from the Agena, but could only fix the thruster by using the reentry control thrusters; thus, Gemini VIII was forced to make an emergency return to Earth just ten hours after launch. Gemini IX, which launched with Thomas P. Stafford, Jr. and Eugene A. Cernan on June 3, 1965, was supposed to have docked with a modified Agena, but the failed release of its protective shroud caused a cancellation of the objective (Grimwood and Hacker 1969).

RELEASED - Printed documents may be obsolete; validate prior to use.

Gemini X launched on July 18, 1966, carrying astronauts John W. Young and Michael Collins. During their four-day mission, Young and Collins rendezvoused and docked with their Agena target in low orbit and then maneuvered their spacecraft to a higher orbit to rendezvous with the Agena target from Gemini VIII. Gemini XI, with Charles "Pete" Conrad, Jr. and Richard F. Gordon, Jr., launched on September 12, 1966. The astronauts rendezvoused and docked with their target vehicle eighty-five minutes after launch. Gemini XII, the last mission of the program, launched on November 11, 1966, with astronauts James A. Lovell, Jr. and Edwin E. "Buzz" Aldrin, Jr. The four-day mission incorporated a rendezvous and docking task with an Agena and three EVAs (Grimwood and Hacker 1969).

4.0 APOLLO PROGRAM: 1961-1975

The Apollo Program had unofficially begun on February 5, 1959, when NASA established the Working Group on Lunar Exploration to formulate a lunar exploration program. Subsequently, a Research Steering Committee was created, which included personnel from the various NASA centers. At its first meeting in May 1959, the committee prioritized various aspects of a space program, which included a manned lunar landing and return to Earth. The concept was further discussed at the committee's second meeting (June 1959) and at its third meeting (December 1959). By the following January (1960), enough progress had been made to bring about the suggestion of a formal name, "Apollo," for the new program, with the goal of landing astronauts on the Moon and returning them safely to Earth. T. Keith Glennan, NASA Administrator, approved the name on July 25, 1960, and it was subsequently announced at the first NASA-Industry Program Plans Conference three days later. On September 1, 1960, the STG officially created the "Apollo Project Office" (Ertel and Morse 1969).

Altogether, the Apollo Program flew thirty-two missions, including the initial research/development and qualification flights, the lunar flights, the Skylab application, and the Apollo-Soyuz Test Project. Three different launch complexes were used: LC 34 (seven launches) and LC 37 (eight launches) at CCAFS, and LC 39 (seventeen launches; twelve from Pad A and five from Pad B) at KSC. Of the total thirty-two flights, fifteen were manned, and of the seven attempted lunar landing missions, six were successful. No major launch vehicle failures of either the Saturn IB or Saturn V occurred; however, there were two major Command/Service Module (CSM) failures, one on the ground (Apollo 1) and one on the way to the Moon (Apollo 13) (NASA 1994).

The first four test flights of the Apollo Program (Saturn/Apollo [SA]-1 through SA-4) were launched from LC 34 and flew suborbital trajectories utilizing the Saturn I Block I vehicle. These flights verified the aerodynamics and structure of the launch vehicle, performed scientific experiments known as Project High Water I and Project High Water II, and tested an "engine-out" contingency, in which the fuel was rerouted from the failed engine to the seven remaining engines (Godwin 2006a; Ertel and Morse 1969; Morse and Bays 1973).

The next phase of testing utilized the Block II configuration of the Saturn I vehicle. All six of these flights were launched from LC 37, since LC 34 was being modified for the assembly, checkout, and launch of the larger, more powerful Saturn IB vehicle. The first flight, SA-5, launched on January 29, 1964, was the first orbital flight of the Apollo Program, as well as the first to test a fully-fueled second stage. The next two flights, SA-6 (May 28, 1964) and SA-7 (September 18, 1964), carried boilerplate CSMs to test telemetry and various systems, as well as the Launch Escape System. Due to the success of these two flights, the next three were used to carry satellites into space (Godwin 2006a; Morse and Bays 1973; Brooks and Ertel 1973).

The first test flight using the Saturn IB vehicle, designated Apollo/Saturn 201 (AS-201), launched from LC 34 on February 26, 1966, carrying the first true spacecraft on a suborbital flight to test its heat shield.

RELEASED - Printed documents may be obsolete; validate prior to use.

Two more unmanned flights followed to test the instrumentation unit and the behavior of the fuel in the vehicle's second stage. AS-202 also subjected the Command Module to the full force of re-entry for the first time. The fourth scheduled flight, set to launch from LC 34 in February 1967, was to be the first manned mission of the Apollo Program. During a countdown simulation on January 27, 1967, the Command Module caught fire on the launch pad, killing astronauts Virgil I. "Gus" Grissom, Edward H. White II, and Roger B. Chaffee. The event was later commemorated as Apollo 1 (Godwin 2006a; Ertel and Newkirk 1978).

Following the fire and subsequent modifications to the spacecraft, NASA conducted three additional unmanned Earth orbital missions to continue verification testing of the Apollo-Saturn combination, and to begin testing of the Lunar Module. Apollo 4 was launched on November 9, 1967. This flight was the first to use the Saturn V vehicle, and thus, the first to launch from the new LC 39, Pad A, at KSC. Apollo 5 launched on January 22, 1968, from LC 37 carrying the first Lunar Module into space for verification tests. Apollo 6 was the final unmanned mission of the Apollo Program; it launched on April 4, 1968, from LC 39, Pad A (Godwin 2006a; Ertel and Newkirk 1978).

Although still considered part of the Apollo Program's testing phase, the October 11, 1968, Apollo 7 launch from LC 34 was the first manned mission, which placed astronauts into an Earth orbit for ten days using a Saturn IB vehicle. The crew, Walter M. Schirra, Jr., Donn F. Eisele, and Walter Cunningham, tested the CSM and their guidance and control systems, the instrument unit, the spacecraft lunar adapter, the new spacesuit design, food supplies, and work routines. During this flight, the astronauts separated the CSM from the second stage in order to practice rendezvous operations with the booster. The spacecraft and astronauts returned to Earth on October 22, after successfully completing all goals of the mission (Godwin 2006a; Ertel and Newkirk 1978).

The next mission, designated Apollo 8, launched on December 21, 1968, from LC 39, Pad A, and became the first manned flight to use the Saturn V vehicle. It was the first mission to reach the Moon, which it orbited ten times before returning to Earth. Apollo 9, which launched on March 3, 1969, from LC 39, Pad A, remained in a low-Earth orbit, where its crew, James A. McDivitt, Russell L. "Rusty" Schweickart, and David R. Scott, performed the first EVA of the Apollo Program and the first docking of the Lunar and Command Modules. Apollo 10 was the "final dress rehearsal" for landing on the Moon. Launched on May 18, 1969, from LC 39, Pad B, it reached the Moon, which it orbited thirty-one times. While in orbit, the crew jettisoned the Lunar Module and allowed it to come within 50,000 feet of the Moon's surface, prior to initializing the ascent stage for its return to the Command Module (the descent stage was left to fall onto the Moon; the ascent stage would be jettisoned into a solar orbit) (Godwin 2006a; Ertel and Newkirk 1978).

On July 16, 1969, Apollo 11 launched from LC 39, Pad A, carrying its crew, astronauts Neil A. Armstrong, Edwin E. "Buzz" Aldrin, Jr., and Michael Collins, into a lunar orbit just over three days later. On July 20, 1969, as Collins remained in the Command Module, Armstrong and Aldrin climbed into the Lunar Module and descended to the Moon's surface. Landing at 4:17 p.m., Eastern Standard Time (EST), Armstrong reported to Mission Control, "Houston, Tranquility Base here. The Eagle has landed" (NASA MSC 1969). Armstrong and Aldrin completed one EVA to collect lunar surface material for scientific analysis. Just over twenty-one hours after landing, the Lunar Module ascent stage lifted-off to successfully dock with the CSM in lunar orbit, and the two astronauts rejoined their colleague in the Command Module, prior to jettisoning the ascent stage. The three astronauts landed in the Pacific Ocean on July 24, 1969, at roughly 12:50 p.m. EST, officially accomplishing the goal set by President John F. Kennedy on May 25, 1961 (NASA KSC 2003; Godwin 2006b; Ertel and Newkirk 1978).

RELEASED - Printed documents may be obsolete; validate prior to use.

Four months later, Apollo 12 launched from LC 39, Pad A, for its rendezvous with the Moon. Essentially a repeat of Apollo 11, the crew remained in lunar orbit for one extra day to take photographs. On April 11, 1970, the ill-fated Apollo 13 lifted-off from LC 39, Pad A. Approximately fifty-six hours after launch, Oxygen Tank No. 2 ruptured, also causing a failure in Oxygen Tank No. 1. The three-man crew of James A. Lovell, Jr., Fred W. Haise, Jr., and John L. "Jack" Swigert, Jr., remained in limbo within the Lunar Module as the ground controllers in Mission Control at the Manned Spacecraft Center frantically worked to bring them home safely. On April 17, they landed on Earth proving the ingenuity of the ground controllers. The event would have repercussions though, as two Apollo flights were removed from the program (Godwin 2006b; Ertel and Newkirk 1978).

The next mission, Apollo 14, was launched on January 31, 1971. Astronauts Alan B. Shepard, Jr., and Edgar D. Mitchell spent just over thirty-three hours on the Moon's surface and conducted two EVAs while Stuart A. Roosa remained in the command module. Apollo 15, which launched on July 26, 1971, was the first mission to use the Lunar Rover, an electric-powered, four-wheel drive vehicle, to traverse around the lunar surface. The crew spent just under sixty-seven hours on the Moon collecting lunar samples, including one dubbed the "Genesis Rock." The next mission, Apollo 16, was essentially a repeat of Apollo 15, albeit with a different lunar landing site. Apollo 17, which launched on December 7, 1972, was the final lunar mission and the only one to carry a scientist-astronaut, Harrison H. "Jack" Schmitt, to the Moon (Godwin 2006b; Ertel and Newkirk 1978).

Skylab, an application of the Apollo Program, served as an early type of space station. With 360 cubic meters (m^3) (12,700 cubic feet [ft^3]) of work and living space, it was the largest habitable structure ever placed in orbit. Skylab was 36 m (117 ft) long, 27 m (90 ft) wide across its solar panels, and had a mass of 90,605 kg (199,750 lbs) with the CSM attached. The station achieved several objectives: scientific investigations in Earth orbit (astronomical, space physics, and biological experiments); applications in Earth orbit (Earth resources surveys); and long-duration spaceflight. Saturn V and Saturn IB rockets were used. Skylab 1 orbital workshop was inhabited in succession by three crews launched in modified Apollo CSMs (Skylab 2, 3 and 4). The crews traveled 112.8 million km (70.5 million mi), circled the Earth 2,476 times, and lived in space for 171.5 days, spending more than 3,000 hours conducting experiments. Data returned included 175,047 frames of solar observation film and 46,146 frames of Earth observation film. Actively used until February 1974, Skylab 1 remained in orbit much longer, until July 11, 1979, when it re-entered Earth's atmosphere over the Indian Ocean and western Australia after completing 34,181 orbits (Anon. 1994:91; NASA 1980:V-32).

The Apollo-Soyuz Test Project (ASTP) of 1975, the final application of the Apollo Program, marked the first international rendezvous and docking in space. The ASTP was the first major cooperation between the only two nations engaged in manned spaceflight. As the first meeting of two manned spacecraft of different nations in space, first docking, and first visits by astronauts and cosmonauts into the others' spacecraft, the ASTP was highly significant. The ASTP established workable joint docking mechanisms, taking the first steps toward mutual rescue capability of both Russian and American manned missions in space (Anon. 1994:96).

This five-year program was conducted to establish space rescue techniques for the U.S. and Soviet Union, conduct scientific experiments, and study the feasibility of more ambitious joint programs in the future. The Soyuz lifted off first on July 15, 1975. The Apollo spacecraft "chased" the Soyuz in orbit, docking with it on July 17. The two spacecraft remained attached, conducting joint experiments and meals, and holding press conferences with the news media of the world, until undocking on July 19. The spacecraft then docked again, for practice, and separated for the last time. Soyuz landed in Russia on July 21. The Americans stayed aloft for three more days conducting a series of experiments. The ASTP proved that American and Russian space programs could cooperate and perform joint missions in space. All major

RELEASED - Printed documents may be obsolete; validate prior to use.

objectives were achieved (NASA 1980:V-36). Following completion of the ASTP in 1975, the facilities of KSC were modified to support the nation's newest launch vehicle, the reusable Space Shuttle.

5.0 SPACE SHUTTLE PROGRAM: 1969-2011

A "new era for the U.S. Space Program" began on February 13, 1969, when President Richard Nixon established the Space Task Group (STG). The purpose of this committee was to conduct a study to recommend a future course for the U.S. Space Program. Three years later, on January 5, 1972, the Space Shuttle Program was initiated in a speech delivered by President Nixon. During this speech, Nixon outlined the end of the Apollo era and the future of a reusable spaceflight vehicle providing "routine access to space." By commencing work at this time, Nixon added, "we can have the Shuttle in manned flight by 1978, and operational a short time after that" (Lindroos 2000). The STG presented three choices of long-range space plans. All included an Earth–orbiting space station, a Space Shuttle, and a manned Mars expedition (NASA History Office 1969). Although none of the original programs presented was eventually selected, NASA implemented a program, shaped by the politics and economic realities of its time, that served as a first step toward any future plans for implementing a space station (Jenkins 2001:99).

Phase A and Phase B Development

The conceptual origins of NASA's Space Shuttle began in the mid to late 1950s, when the Department of Defense and NASA independently began to explore the feasibility of reusable launch vehicles in space for military operations (Williamson 1999:162). Programs such as the U.S. Air Force's X-20 Dynamic Soaring (Dyna-Soar), Precision Recovery Including Maneuvering Entry (PRIME), and Aerothermodyamic/Elastic Structural Systems Environmental Tests (ASSET), ultimately would provide the basis for the design of the Space Shuttle (Williamson 1999:162; Guilmartin, Jr. and Mauer 1988).

The definition of the Space Shuttle took shape largely between 1969 and early 1972. Feasibility and concept studies (Phase A) were succeeded by definition studies (Phase B), conducted by both NASA and industry contractors. For the contractors, these studies were carried out in an environment of changing baseline requirements, largely influenced by the needs of the Air Force and tempered by the economic realities of the time (Jenkins 2001:78). The Phase A studies began with the consideration of a broad range of concepts, including straight versus delta wings; internal versus external propellant tanks; manned versus unmanned boosters; liquid versus solid propellant boosters; and sequential burn versus parallel burn solid rocket motors. NASA's preferred shuttle configuration at this time was a fully reusable, two-stage vehicle that concentrated on economy and safety as opposed to optimal payload performance (Jenkins 2001:78).

Prior to the submittal of the final Phase A study reports, NASA initiated the Phase B definition program, which included the preliminary design of a fully reusable two-stage Space Shuttle vehicle. Both straight-winged and delta-winged designs were studied. Shortly after Phase B studies were initiated, NASA selected industry contractors to complete "Extended Phase A" studies, which examined alternate Shuttle design concepts to answer the basic question of whether there was a lower cost Shuttle option than the two-stage fully reusable system, such as a partially-reusable configuration. The shift from a fully-reusable to partially-reusable vehicle reflected NASA's pragmatism in the face of funding obstacles (U.S. House 1981:452). Thus, on January 5, 1972, as a result of the studies, President Nixon authorized NASA to proceed with the design and building of a partially reusable Space Shuttle consisting of a reusable orbiter, three reusable main engines, two reusable solid rocket boosters, and one non-reusable external tank for propellant.

RELEASED - Printed documents may be obsolete; validate prior to use.

Phases C/D: Design, Development, Test, and Evaluation

With the design of the Space Shuttle determined, NASA proceeded to Phases C/D, Design, Development, Test, and Evaluation. While Phases A and B considered the design of the overall vehicle, Phases C/D divided the different elements into separate contracts. NASA's Lyndon B. Johnson Space Center (JSC) in Houston, Texas (then, the Manned Spacecraft Center), which had been designated as the lead center for Shuttle Program management, was tasked with overseeing overall engineering and systems integration, and basic performance requirements for the Shuttle, as well as for development and testing of the orbiter. The George C. Marshall Space Flight Center (MSFC) in Huntsville, Alabama, was given the responsibility for the development of the Space Shuttle main engines, the solid rocket boosters, the external tank, and for all propulsion-related tasks. KSC was assigned the responsibility for designing the launch and recovery facilities and developing methods for shuttle assembly, checkout, and launch operations (Ezell 1988:121-124, table 2-57; Williamson 1999:172-174).

Between April 1972 and June 1974, JSC and MSFC awarded the contracts for their designated elements. The Space Division of North American Rockwell Corporation (Rockwell) of Downey, California, was selected as the prime contractor responsible for design, development, and production of the orbiter vehicle and for integration of all elements of the Space Shuttle system (Ezell 1988:121-124, table 2-57; Whalen and McKinley 1988:21, 26). The contract for the development and production of the engines went to North American Rockwell's Rocketdyne Division (later, Pratt & Whitney Rocketdyne) in Canoga Park, California (Dunar and Waring 1999:288). Martin Marietta (later, Lockheed Martin Space Systems Company) of New Orleans, Louisiana, was awarded the contract for the external tank, and the Thiokol Chemical Company (later, ATK-Thiokol) of Promontory, Utah, was selected as the contractor for the motor segments of the solid rocket boosters Whalen and McKinley 1988:26, 29).

In June 1974, Rockwell began construction on the orbiter prototype, *Enterprise;* final assembly was completed in March 1976. Slated to be named *Constitution* in honor of the Bicentennial, as the result of a massive letter campaign, on September 8, 1976, Orbiter Vehicle (OV)-101 was officially designated *Enterprise* after the Star Trek television program starship. The rollout of *Enterprise* on September 17, 1976, was attended by thousands, including Star Trek actors Leonard Nimoy, George Takei, and DeForest Kelly (Heppenheimer 2002b:100-101). As a prototype/test article, *Enterprise* featured numerous substitute components as placeholders for the equipment found in vehicles built for actual spaceflight. In the weeks before its official rollout, *Enterprise* was used in a horizontal ground vibration test at Palmdale to verify structural dynamics data for a full-sized orbiter (Heppenheimer 2002b:100, 251-252). Additionally, *Enterprise* was used in the Approach and Landing Test Program at Edwards Air Force Base in California, which was completed in four phases between February and October 1977. The first phase consisted of high-speed taxi tests to "assess directional stability and control, elevator effectiveness during rotation prior to takeoff, airplane response in pitch, thrust reverser effectiveness, use of the 747's brakes, and airframe buffet" (Heppenheimer 2002b:106). The second phase of "captive-inert" tests served to qualify the shuttle carrier aircraft (SCA) for ferry operations, as well as the orbiter's unpowered landing capabilities. The "captive-active" tests, phase three of the program, entailed powering up the orbiter while it was attached to the SCA. The final phase of the program consisted of five test free flights to provide both operational experience as well as "benchmarking data for the flight simulators that were the working tools of day-to-day astronaut training" ((Heppenheimer 2002b:121).

Between November 1975 and February 1978, Rockwell assembled a high-fidelity test structure that was comprised of a replica orbiter airframe and crew module, but not equipped for actual spaceflight. This test structure, which was later transformed into the Orbiter *Challenger*, was subjected to various simulated stress levels provided by the Space Shuttle main engines that duplicated the launch, ascent, on-orbit, reentry, and landing phases of flight (Jenkins 2001:241). Heating and cooling simulations were also

RELEASED - Printed documents may be obsolete; validate prior to use.

conducted using gaseous nitrogen to simulate the cold of space and heating blankets to simulate ascent and reentry heating (Heppenheimer 2002b:252-256). While these tests were being conducted, *Enterprise* was at MSFC for a series of Mated Vertical Ground Vibration Tests, the objective of which was to determine the structural integrity of the shuttle vehicle, with an emphasis on the period of flight just prior to booster separation (Dunar and Waring 1999:314). After the Mated Vertical Ground Vibration Tests, *Enterprise* was moved to KSC where it was used at LC 39, Pad A, to verify the correct locations of maintenance platforms, and to check crew escape procedures (Jenkins 2001:216).

Orbital Test Flights: 1981-1982

In November 1977, Rockwell began final assembly of the first orbiter intended for spaceflight, *Columbia*. It was completed in March 1979, carried overland to Edwards Air Force Base, and ferried by the SCA to the KSC. Originally scheduled to lift off in late 1979, the launch date was delayed by problems with both the main engine components as well as the thermal protection system. Upon its arrival at Kennedy, the orbiter was missing thousands of tiles that came off during the ferry flight. Additionally, *Columbia* arrived from Rockwell without its main engines, auxiliary power units, on-board computers, and fuel cells installed. About six months of assembly work needed to be done. As the result of changed requirements for increased tile strength ("densification"), for twenty months technicians at KSC worked three shifts per day, six days per week installing, testing, removing, and reinstalling approximately 30,000 tiles. *Columbia* spent 610 days in the Orbiter Processing Facility, another 35 days in the Vehicle Assembly Building, and 105 days at LC 39, Pad A, before its maiden launch.

Commanded by John W. Young and piloted by Robert L. Crippen, STS-1, the first orbital test flight and first mission of the Space Shuttle Program, lifted off at 7:00 a.m. on April 12, 1981 (see Tables 9-1 and 9-2 for a tabulation of all Space Shuttle missions). *Columbia* returned on April 14, completing her historic mission at Edwards Air Force Base. This initial mission, lasting two days, six hours, 20 minutes, and 53 seconds, demonstrated *Columbia's* ability to fly into orbit, conduct on-orbit operations, and return safely. *Columbia* flew three additional test flights in 1981 and 1982, all with a crew of two. On March 30, 1982, at the completion of STS-3, *Columbia* made its landing at White Sands Missile Range (at NASA's White Sands Space Harbor) in New Mexico because of flooding at Edwards. This event marked the only time in the history of the Space Shuttle Program that the orbiter landed at White Sands, or anywhere other than Edwards Air Force Base or Kennedy Space Center. The Orbital Test Flight Program ended in July 1982 following STS-4, with 95 percent of its objectives completed, including complete biomedical flight test requirements (Jenkins 2001).

Operational Flights

STS-5, which began with the lift-off of *Columbia* on November 11, 1982, marked the first operational flight of the Space Shuttle Program. The mission, which lasted 122 hours and 14 minutes, ended on November 16 with a landing at Edwards Air Force Base. *Challenger* was added to the Shuttle fleet in 1982, and made its first flight (STS-6) in April 1983. *Discovery* and *Atlantis* were delivered to KSC in November 1983 and April 1985, respectively. *Discovery* lifted off for her maiden flight (STS-41D) on August 30, 1984; the first launch of *Atlantis* (STS-51J) occurred on October 3, 1985.

Between 1982 and 1985, *Columbia*, *Challenger*, *Discovery*, and *Atlantis* collectively flew 20 missions, averaging four to five launches per year. Despite the 1970s projections of a maximum of sixty launches per year, in reality, the nine flights in 1985 were a record for the Space Shuttle Program. All of the launches, from 1982 through 1985, were made from Launch Complex 39, Pad A, and all but six missions ended with landings at Edwards AFB. Highlights from these years include two dedicated Department of Defense flights and five Spacelab missions.

RELEASED - Printed documents may be obsolete; validate prior to use.

Table 9-1. Tabulation of Space Shuttle Missions, 1981 through 2011.

Year	OV-102 *Columbia*	OV-99 *Challenger*	OV-103 *Discovery*	OV-104 *Atlantis*	OV-105 *Endeavour*	Yearly Total
1981	2					2
1982	3					3
1983	1	3				4
1984		3	2			5
1985		3	4	2		9
1986	1	1a				2
1987						0
1988			1b	1		2
1989	1		2	2		5
1990	2		2	2		6
1991	1		2	3		6
1992	2		2	2	2	8
1993	2		2		3	7
1994	2		2	1	2	7
1995	1		2	2	2	7
1996	3			2	2	7
1997	3		2	3		8
1998	1		2		2	5
1999	1		2			3
2000			1	2	2	5
2001			2	2	2	6
2002	1			2	2	5
2003	1c					1
2004						0
2005			1d			1
2006			2	1		3
2007			1	1	1	3
2008			1	1	2	4
2009			2	2	1	5
2010			1	1	2	4
2011			1	1	1	3
Totals	28	10	39	33	25	135

a *Challenger* (STS-33) broke up 1 minute and 13 seconds after launch, January 28, 1986.
b Return to Flight, *Discovery* (STS-26), September 29, 1988.
c *Columbia* destroyed during reentry, February 1, 2003.
d Return to Flight, *Discovery* (STS-114), July 26, 2005.

RELEASED - Printed documents may be obsolete; validate prior to use.

Table 9-2. Space Shuttle Mission Launch and Landing Data, 1981 through July 2011.

Seq. No.	Mission No.	Orbiter - Flight No.	Launch Date	Launch Site		Landing Site	Landing Date
				Pad A	Pad B		
1	STS-1	*Columbia* - 1	12 Apr 1981	X		EAFB, 23	14 Apr 1981
2	STS-2	*Columbia* - 2	12 Nov 1981	X		EAFB, 23	14 Nov 1981
3	STS-3	*Columbia* - 3	22 Mar 1982	X		WSMR, 17	30 Mar 1982
4	STS-4	*Columbia* - 4	27 Jun 1982	X		EAFB, 22	04 Jul 1982
5	STS-5	*Columbia* - 5	11 Nov 1982	X		EAFB, 22	16 Nov 1982
6	STS-6	*Challenger* - 1	04 Apr 1983	X		EAFB, 22	09 Apr 1983
7	STS-7	*Challenger* - 2	18 Jun 1983	X		EAFB, 15	24 Jun 1983
8	STS-8	*Challenger* - 3	30 Aug 1983	X		EAFB, 22	05 Sep 1983
9	STS-9	*Columbia* - 6	28 Nov 1983	X		EAFB, 17L	08 Dec 1983
10	STS-41-B	*Challenger* - 4	03 Feb 1984	X		KSC, 15	11 Feb 1984
11	STS-41-C	*Challenger* - 5	06 Apr 1984	X		EAFB, 17L	13 Apr 1984
12	STS-41-D	*Discovery* - 1	30 Aug 1984	X		EAFB, 17L	05 Sep 1984
13	STS-41-G	*Challenger* - 6	05 Oct 1984	X		KSC, 33	13 Oct 1984
14	STS-51-A	*Discovery* - 2	08 Nov 1984	X		KSC, 15	16 Nov 1984
15	STS-51-C	*Discovery* - 3	24 Jan 1985	X		KSC, 15	27 Jan 1985
16	STS-51-D	*Discovery* - 4	12 Apr 1985	X		KSC, 33	19 Apr 1985
17	STS-51-B	*Challenger* - 7	29 Apr 1985	X		EAFB, 17L	06 May 1985
18	STS-51-G	*Discovery* - 5	17 Jun 1985	X		EAFB, 23	24 Jun 1985
19	STS-51-F	*Challenger* - 8	29 Jul 1985	X		EAFB, 23	06 Aug 1985
20	STS-51-I	*Discovery* - 6	27 Aug 1985	X		EAFB, 23	03 Sep 1985
21	STS-51-J	*Atlantis* - 1	03 Oct 1985	X		EAFB, 23	07 Oct 1985
22	STS-61-A	*Challenger* - 9	30 Oct 1985	X		EAFB, 17L	06 Nov 1985
23	STS-61-B	*Atlantis*- 2	26 Nov 1985	X		EAFB, 22	03 Dec 1985
24	STS-61-C	*Columbia* - 7	12 Jan 1986	X		EAFB, 22	18 Jan 1986
25	STS-51-L	*Challenger* - 10	28 Jan 1986		X	----------	----------
26	STS-26	*Discovery* - 7	29 Sep 1988		X	EAFB, 17L	03 Oct 1988
27	STS-27	*Atlantis* - 3	02 Dec 1988		X	EAFB, 17L	06 Dec 1988
28	STS-29	*Discovery* - 8	13 Mar 1989		X	EAFB, 22	18 Mar 1989
29	STS-30	*Atlantis* - 4	04 May 1989		X	EAFB, 22	08 May 1989
30	STS-28	*Columbia* - 8	08 Aug 1989		X	EAFB, 17L	13 Aug 1989
31	STS-34	*Atlantis* - 5	18 Oct 1989		X	EAFB, 23L	23 Oct 1989
32	STS-33	*Discovery* - 9	22 Nov 1989		X	EAFB, 04	27 Nov 1989
33	STS-32	*Columbia* - 9	09 Jan 1990	X		EAFB, 22	20 Jan 1990
34	STS-36	*Atlantis* - 6	28 Feb 1990	X		EAFB, 23L	04 Mar 1990
35	STS-31	*Discovery* - 10	24 Apr 1990		X	EAFB, 22	29 Apr 1990
36	STS-41	*Discovery* - 11	06 Oct 1990		X	EAFB, 22	10 Oct 1990
37	STS-38	*Atlantis* - 7	15 Nov 1990	X		KSC, 33	20 Nov 1990
38	STS-35	*Columbia* - 10	02 Dec 1990		X	EAFB, 22	10 Dec 1990
39	STS-37	*Atlantis* - 8	05 Apr 1991		X	EAFB, 33	11 Apr 1991
40	STS-39	*Discovery* - 12	28 Apr 1991	X		KSC, 15	06 May 1991
41	STS-40	*Columbia* - 11	05 Jun 1991		X	EAFB, 22	14 Jun 1991
42	STS-43	*Atlantis* - 9	02 Aug 1991	X		KSC, 15	11 Aug 1991
43	STS-48	*Discovery* - 13	12 Sep 1991	X		EAFB, 22	18 Sep 1991

RELEASED - Printed documents may be obsolete; validate prior to use.

Table 9-2. Space Shuttle Mission Launch and Landing Data, 1981 through July 2011 (cont.).

Seq. No.	Mission No.	Orbiter - Flight No.	Launch Date	Launch Site		Landing Site	Landing Date
				Pad A	Pad B		
44	STS-44	*Atlantis* - 10	24 Nov 1991	X		EAFB, 05R	01 Dec 1991
45	STS-42	*Discovery* - 14	22 Jan 1992	X		EAFB, 22	30 Jan 1992
46	STS-45	*Atlantis* - 11	24 Mar 1992	X		KSC, 33	02 Apr 1992
47	STS-49	*Endeavour* - 1	07 May 1992		X	EAFB, 22	16 May 1992
48	STS-50	*Columbia* - 12	25 Jun 1992	X		KSC, 33	09 Jul 1992
49	STS-46	*Atlantis* - 12	31 Jul 1992		X	KSC, 33	08 Aug 1992
50	STS-47	*Endeavour* - 2	12 Sep 1992		X	KSC, 33	20 Sep 1992
51	STS-52	*Columbia* - 13	22 Oct 1992		X	KSC, 33	01 Nov 1992
52	STS-53	*Discovery* - 15	02 Dec 1992	X		EAFB, 22	09 Dec 1992
53	STS-54	*Endeavour* - 3	13 Jan 1993		X	KSC, 33	19 Jan 1993
54	STS-56	*Discovery* - 16	08 Apr 1993		X	KSC, 33	17 Apr 1993
55	STS-55	*Columbia* - 14	26 Apr 1993	X		EAFB, 22	06 May 1993
56	STS-57	*Endeavour* - 4	21 Jun 1993		X	KSC, 33	01 Jul 1995
57	STS-51	*Discovery* - 17	12 Sep 1993		X	KSC, 15	22 Sep 1993
58	STS-58	*Columbia* - 15	18 Oct 1993		X	EAFB, 22	01 Nov 1993
59	STS-61	*Endeavour* - 5	02 Dec 1993		X	KSC, 33	13 Dec 1993
60	STS-60	*Discovery* - 18	03 Feb 1994	X		KSC, 15	11 Feb 1994
61	STS-62	*Columbia* - 16	04 Mar 1994		X	KSC, 33	18 Mar 1994
62	STS-59	*Endeavour* - 6	09 Apr 1994	X		EAFB, 22	20 Apr 1994
63	STS-65	*Columbia* - 17	08 Jul 1994	X		KSC, 33	23 Jul 1994
64	STS-64	*Discovery* - 19	09 Sep 1994		X	EAFB, 04	20 Sep 1994
65	STS-68	*Endeavour* - 7	30 Sep 1994	X		EAFB, 22	11 Oct 1994
66	STS-66	*Atlantis* - 13	03 Nov 1994		X	EAFB, 22	14 Nov 1994
67	STS-63	*Discovery* - 20	03 Feb 1995		X	KSC, 15	11 Feb 1995
68	STS-67	*Endeavour* - 8	02 Mar 1995	X		EAFB, 22	18 Mar 1995
69	STS-71	*Atlantis* - 14	27 Jun 1995	X		KSC, 15	07 Jul 1995
70	STS-70	*Discovery* - 21	13 Jul 1995		X	KSC, 33	22 Jul 1995
71	STS-69	*Endeavour* - 9	07 Sep 1995	X		KSC, 33	18 Sep 1995
72	STS-73	*Columbia* - 18	20 Oct 1995		X	KSC, 33	05 Nov 1995
73	STS-74	*Atlantis* - 15	12 Nov 1995	X		KSC, 33	20 Nov 1995
74	STS-72	*Endeavour* - 10	10 Jan 1996		X	KSC, 15	20 Jan 1996
75	STS-75	*Columbia* - 19	22 Feb 1996		X	KSC, 33	09 Mar 1996
76	STS-76	*Atlantis* - 16	22 Mar 1996		X	EAFB, 22	31 Mar 1996
77	STS-77	*Endeavour* - 11	19 May 1996		X	KSC, 33	29 May 1996
78	STS-78	*Columbia* - 20	20 Jun 1996		X	KSC, 33	07 Jul 1996
79	STS-79	*Atlantis* - 17	16 Sep 1996	X		KSC, 15	26 Sep 1996
80	STS-80	*Columbia* - 21	19 Nov 1996		X	KSC, 33	07 Dec 1996
81	STS-81	*Atlantis* - 18	12 Jan 1997		X	KSC, 33	22 Jan 1997
82	STS-82	*Discovery* - 22	11 Feb 1997	X		KSC, 15	21 Feb 1997
83	STS-83	*Columbia* - 22	04 Apr 1997	X		KSC, 33	08 Apr 1997
84	STS-84	*Atlantis* - 19	15 May 1997	X		KSC, 33	24 May 1997
85	STS-94	*Columbia* - 23	01 Jul 1997	X		KSC, 33	17 Jul 1997
86	STS-85	*Discovery* - 23	07 Aug 1997	X		KSC, 33	19 Aug 1997

RELEASED - Printed documents may be obsolete; validate prior to use.

Table 9-2. Space Shuttle Mission Launch and Landing Data, 1981 through July 2011 (cont.).

Seq. No.	Mission No.	Orbiter - Flight No.	Launch Date	Launch Site		Landing Site	Landing Date
				Pad A	Pad B		
87	STS-86	*Atlantis* - 20	25 Sep 1997	X		KSC, 15	6 Oct 1997
88	STS-87	*Columbia* - 24	19 Nov 1997		X	KSC, 33	05 Dec 1997
89	STS-89	*Endeavour* - 12	22 Jan 1998	X		KSC, 15	31 Jan 1998
90	STS-90	*Columbia* - 25	17 Apr 1998		X	KSC, 33	03 May 1998
91	STS-91	*Discovery* - 24	02 Jun 1998	X		KSC, 15	12 Jun 1998
92	STS-95	*Discovery* - 25	29 Oct 1998		X	KSC, 33	07 Nov 1998
93	STS-88	*Endeavour* - 13	04 Dec 1998	X		KSC, 15	15 Dec 1998
94	STS-96	*Discovery* - 26	27 May 1999		X	KSC, 15	06 Jun 1999
95	STS-93	*Columbia* - 26	23 Jul 1999		X	KSC, 33	27 Jul 1999
96	STS-103	*Discovery* - 27	19 Dec 1999		X	KSC, 33	27 Dec 1999
97	STS-99	*Endeavour* - 14	11 Feb 2000	X		KSC, 33	22 Feb 2000
98	STS-101	*Atlantis* - 21	19 May 2000	X		KSC, 15	29 May 2000
99	STS-106	*Atlantis* - 22	08 Sep 2000		X	KSC, 15	20 Sep 2000
100	STS-92	*Discovery* - 28	11 Oct 2000	X		EAFB, 22	24 Oct 2000
101	STS-97	*Endeavour* - 15	30 Nov 2000		X	KSC, 15	11 Dec 2000
102	STS-98	*Atlantis* - 23	07 Feb 2001	X		EAFB, 22	20 Feb 2001
103	STS-102	*Discovery* - 29	08 Mar 2001		X	KSC, 15	21 Mar 2001
104	STS-100	*Endeavour* - 16	19 Apr 2001	X		EAFB, 22	1 May 2001
105	STS-104	*Atlantis* - 24	12 Jul 2001		X	KSC, 15	24 Jul 2001
106	STS-105	*Discovery* - 30	10 Aug 2001	X		KSC, 15	22 Aug 2001
107	STS-108	*Endeavour* - 17	05 Dec 2001		X	KSC, 15	17 Dec 2001
108	STS-109	*Columbia* - 27	01 Mar 2002	X		KSC, 33	12 Mar 2002
109	STS-110	*Atlantis* – 25	08 Apr 2002		X	KSC, 33	19 Apr 2002
110	STS-111	*Endeavour* - 18	05 Jun 2002	X		EAFB, 22	19 Jun 2002
111	STS-112	*Atlantis* - 26	07 Oct 2002		X	KSC, 33	18 Oct 2002
112	STS-113	*Endeavour* - 19	23 Nov 2002	X		KSC, 33	07 Dec 2002
113	STS-107	*Columbia* - 28	16 Jan 2003	X		----------	----------
114	STS-114	*Discovery* - 31	26 Jul 2005		X	EAFB, 22	09 Aug 2005
115	STS-121	*Discovery* - 32	4 Jul 2006		X	KSC, 15	17 Jul 2006
116	STS-115	*Atlantis* - 27	9 Sep 2006		X	KSC, 33	21 Sep 2006
117	STS-116	*Discovery* - 33	9 Dec 2006		X	KSC, 15	22 Dec 2006
118	STS-117	*Atlantis* - 28	8 June 2007	X		EAFB, 22	22 June 2007
119	STS-118	*Endeavour* - 20	8 Aug 2007	X		KSC, 15	21 Aug 2007
120	STS-120	*Discovery* - 34	23 Oct 2007	X		KSC, 33	7 Nov 2007
121	STS-122	*Atlantis* - 29	7 Feb 2007	X		KSC, 15	20 Feb 2008
122	STS-123	*Endeavour* - 21	11 Mar 2008	X		KSC, 15	26 Mar 2008
123	STS-124	*Discovery* - 35	31 May 2008	X		KSC, 15	14 June 2008
124	STS-126	*Endeavour* - 22	14 Nov 2008	X		EAFB, 04-L	20 Nov 2008
125	STS-119	*Discovery* - 36	15 Mar 2009	X		KSC, 15	28 Mar 2009
126	STS-125	*Atlantis* - 30	11 May 2009	X		EAFB, 22	24 May 2009
127	STS-127	*Endeavour* - 23	15 July 2009	X		KSC, 15	31 July 2009
128	STS-128	*Discovery* - 37	28 Aug 2009	X		EAFB, 22-L	11 Sep 2009
129	STS-129	*Atlantis* - 31	16 Nov 2009	X		KSC, 33	27 Nov 2009

RELEASED - Printed documents may be obsolete; validate prior to use.

Table 9-2. Space Shuttle Mission Launch and Landing Data, 1981 through July 2011(cont.).

Seq. No.	Mission No.	Orbiter - Flight No.	Launch Date	Launch Site		Landing Site	Landing Date
				Pad A	Pad B		
130	STS-130	*Endeavour* - 24	8 Feb 2010	X		KSC, 15	21 Feb 2010
131	STS-131	*Discovery* - 38	5 Apr 2010	X		KSC, 33	20 Apr 2010
132	STS-132	*Atlantis* - 32	14 May 2010	X		KSC, 33	26 May 2010
133	STS-133	*Discovery* - 39	24 Feb 2011	X		KSC, 15	9 Mar 2011
134	STS-134	*Endeavour* - 25	16 May 2011	X		KSC, 15	1 June 2011
135	STS-135	*Atlantis* - 33	8 Jul 2011	X		KSC, 15	21 Jul 2011

The *Challenger* Accident and Aftermath

On January 28, 1986, 73 seconds after the launch of *Challenger*, the spacecraft was destroyed, and all seven astronauts, Commander Francis R. Scobee; Pilot Michael J. Smith; Mission Specialists Ellison S. Onizuka, Judith A. Resnik, and Ronald E. McNair; Payload Specialist George B. Jarvis; and the first teacher selected to fly in space, Sharon Christa McAuliffe, perished. Following this tragedy, NASA and President Reagan formed a thirteen-member commission to investigate the cause of the accident. The Presidential Commission on the Space Shuttle Challenger Accident, popularly known as the Rogers Commission after its chairman, William P. Rogers, was tasked with reviewing the images (video, film and still photography), telemetry data, and debris evidence. The Commission concluded that the "loss of the Space Shuttle Challenger was caused by a failure in the joint between the two lower segments of the right Solid Rocket Motor" (Jenkins 2001:279).

In addition to identifying the cause of the *Challenger* accident, the Rogers Commission report, issued on June 6, 1986, included a review of the Space Shuttle Program. The report concluded "that the drive to declare the Shuttle operational had put enormous pressures on the system and stretched its resources to the limit" (CAIB 2003:25). In addition to mechanical failure, the Commission noted a number of NASA management failures that contributed to the catastrophe. Nine basic recommendations were made. Among the tangible actions taken were extensive redesign of the solid rocket boosters; upgrading of the Space Shuttle tires, brakes, and nose wheel steering mechanisms; and the addition of a drag chute to help reduce speed upon landing. Other changes involved reorganization and decentralization of the program. Experienced astronauts were placed in key NASA management positions, all documented waivers to existing flight safety criteria were revoked and forbidden, and a policy of open reviews was implemented (Lethbridge 2001). Also, in response to the Presidential Commission Recommendation VIII regarding flight rate, NASA implemented several actions to achieve a flight level consistent with program resources and the addition of a fourth orbiter to the fleet. In cooperation with the Department of Defense, NASA adopted a new mixed-fleet concept comprised of expendable launch vehicles in addition to the Shuttle and reassigned the deployments of military payloads from the Shuttle to those expendable vehicles (Rogers Commission 1986a:164-177, 1986b:71-78, 1986d:75).

In the aftermath of the *Challenger* accident, and following the recommendation of the Rogers Commission for organizational change, NASA moved the management of the Space Shuttle Program from Johnson Space Center to NASA Headquarters, with the aim of preventing communication deficiencies (CAIB 2003:101). In addition, an exhaustive investigation by a Senate subcommittee resulted in the cancellation of Department of Defense plans to activate the Vandenberg Launch Site in California, leaving the United States without a manned polar launch capability.

RELEASED - Printed documents may be obsolete; validate prior to use.

In July 1987, NASA awarded a contract to Rockwell for construction of *Endeavour* to replace *Challenger*. To build the new orbiter, Rockwell used structural spares previously constructed between 1983 and 1987 under contract with NASA. Assembly of *Endeavour* was completed in July 1990, and the orbiter was delivered to KSC in May 1991; she launched on her maiden flight (STS-49) on May 7, 1992.

The launch of *Discovery* (STS-26) from Kennedy's LC 39, Pad B, on September 29, 1988, marked a Return to Flight after a 32-month hiatus in manned spaceflight following the *Challenger* accident. STS-26 carried a crew of five and a Tracking and Data Relay Satellite (Williamson 1999:186). Designated as a test flight, this mission featured the first use of the redesigned solid rocket boosters. In addition, the astronauts donned new partial-pressure flight suits and practiced using the new emergency escape system (Rumerman 2007:46).

The years following the STS-26 flight "were among the most productive in the Shuttle's history, as a long backlog of payloads finally made it to the launch pad" (Reichardt 2002:65). Between 1988 and 2002, a total of 87 missions launched from KSC, averaging five to six yearly missions; from 1992 through 1997, there were seven or eight yearly missions. On February 3, 1995, a program milestone was reached when *Discovery* (STS-63) became the first orbiter to complete twenty missions. Significant accomplishments from these years included the deployment of the Hubble Space Telescope and four of its servicing missions, twenty-three Spacelab missions, eight dedicated Department of Defense flights, and the early construction of the International Space Station (ISS).

Additionally, the joint U.S./Russian Shuttle-*Mir* Program occurred during this time. The Program was initiated in 1995 as a precursor to construction of the ISS, although the Russian *Mir* had been launched in February 1986 (Reichhardt 2002:85). The first Space Shuttle approach and flyaround of *Mir* took place on February 3, 1995 (STS-63); the first *Mir* docking was in June 1995 (STS-71). During the three-year Shuttle-*Mir* Program the Space Shuttle docked with *Mir* nine times and seven U.S. astronauts served tours on *Mir* (Dr. Norman Thagard was the first). Many of the missions involved earth science experiments and the program, as a whole, prepared U.S. astronauts for living and working in space, including the performance of many activities they would later use to construct the ISS (Rumerman and Garber 2000:3).

Columbia Accident and Aftermath

On January 16, 2003, *Columbia* (STS-107) launched from LC 39, Pad A, carrying a crew of seven, including the first Israeli astronaut. The landing was set for February 1, following a sixteen-day mission. Sixteen minutes prior to its scheduled touchdown at KSC, the spacecraft broke apart during reentry over eastern Texas. All members of the crew, Commander Rick D. Husband; Pilot William C. McCool; Mission Specialists David M. Brown, Kalpana Chawla, Michael P. Anderson, and Laurel Clark; and Israeli Payload Specialist Ilan Ramon, were killed.

Following the accident, a seven-month investigation ensued, including a four-month search to recover debris. The Columbia Accident Investigation Board (CAIB) determined that the physical cause of the accident was a breach in the thermal protection system on the leading edge of the left wing. This resulted from a piece of insulating foam, which separated from the ramp section of the external tank after launch and struck the wing in the vicinity of reinforced carbon-carbon panel number 8 (CAIB 2003:9). NASA spent more than two years researching and implementing safety improvements for the orbiters, solid rocket boosters, and external tank.

In the aftermath of the *Columbia* accident, the Space Shuttle fleet was grounded and construction on the ISS was placed on hold. *Discovery's* first post-*Columbia* Return to Flight mission (STS-114) launched on July 26, 2005 (Launius 2003:214-216). The flight marked the first time a shuttle launch was extensively

RELEASED - Printed documents may be obsolete; validate prior to use.

documented with new and upgraded ground-based cameras, radar systems, and airborne cameras mounted to high-altitude aircraft. It also was the first mission to use the new orbiter boom sensor system to scan the orbiter's exterior once in orbit. In addition, the space station crew photographed different areas of the vehicle to look for possible damage caused by loosened thermal protection system materials. *Discovery* also flew with sensors embedded in her wings to perform an analysis of her thermal protection system. Her STS-121 mission, which launched on July 4, 2006, served as the second test flight following the *Columbia* accident, continuing the analysis of the vehicle's safety improvements (Rumerman 2007:72-73). During this mission, astronauts conducted the first spacewalk that demonstrated techniques for repairing thermal protection system components in orbit.

In the meantime, on January 14, 2004, President George W. Bush announced that in 2010, following completion of the ISS, the Space Shuttle would be retired after nearly thirty years of service (WCPD 2004). Following the President's speech, NASA released *The Vision for Space Exploration*, which outlined the Agency's approach to the new direction in space exploration (NASA HQ 2004). In 2006, NASA announced the start of the Constellation Program, which included development of the Crew Exploration Vehicle (CEV), named *Orion*, and a launch vehicle to place the CEV into space. As part of this initiative, NASA decided to use the Space Shuttle to complete assembly of the ISS. The Constellation Program, and its vehicles, would then take over transporting humans to the ISS and eventually carry both crew and cargo on missions to explore the Moon, Mars, and beyond. Twenty of the 22 post-*Columbia* accident flights were devoted to finishing the construction of the ISS. The other two missions completed the final servicing of the Hubble Space Telescope (STS-125) and carried supplies to the ISS (STS-135).

On October 11, 2010, President Barack Obama signed the *National Aeronautics and Space Administration Authorization Act of 2010,* which redefined the future direction of NASA. As part of this Act, the moon-oriented Constellation Program was cancelled in favor of a manned mission to an asteroid by 2025, followed by a manned mission to Mars in the 2030s. The CEV, however, was retained to serve as an escape capsule for the ISS and, potentially, a deep space vehicle. The plan also extended operations on the ISS to the year 2020, calling for private American companies to develop spacecraft for carrying astronauts to the station (FoxNews.com 2010).

Transition and Retirement

On April 12, 2011, the thirtieth anniversary of the maiden launch of the Space Shuttle Program, NASA Administrator Charles Bolden announced that the Space Shuttle fleet would be displayed permanently at institutions across the country. *Enterprise* would be moved from the Smithsonian's National Air and Space Museum's Steven F. Udvar-Hazy Center in Chantilly, Virginia, to the Intrepid Sea, Air & Space Museum in New York. The Udvar-Hazy Center would become the new home for *Discovery*. *Endeavour* would go to the California Science Center in Los Angeles, California, and *Atlantis* would be displayed at the Kennedy Space Center Visitor Complex in Florida (Weaver 2011).

Following their final flights and prior to their relocation, each orbiter underwent a series of processing activities to transform her from a spaceflight vehicle into a museum display. Included in the effort was a streamlined version of the standard post-mission processing; cleansing the orbiters of hazardous components and removing classified hardware; removing selected components for study by NASA engineers/technicians, for use in future programs, or as requested by other groups (e.g., the Russian Space Agency); and preparing the orbiter for display (NASA JSC 2010; Roberts 2010:6).

Discovery was the first Shuttle orbiter to complete Transition and Retirement processing; *Endeavour* was the second, and *Atlantis* was the last. *Discovery* made her final ferry flight on April 17, 2012, from the Shuttle Landing Facility at the KSC to the Dulles International Airport (Taylor 2011; Gebhardt 2011).

RELEASED - Printed documents may be obsolete; validate prior to use.

After the delivery of *Discovery*, the shuttle carrier aircraft conveyed *Enterprise* to New York on April 27, 2012, and *Endeavour* from Florida to the Los Angeles Airport in September 2012 (Bergin 2011). *Atlantis* was moved to the KSC Visitor Complex in November 2012.

6.0 INTERNATIONAL SPACE STATION

Following World War II, the concept of an orbiting space station gained widespread interest among the American public, due in large part to the efforts of Dr. Wernher von Braun, a German rocket scientist who had emigrated to the U.S. after the war as part of Project Paperclip. Through several articles for *Collier's* magazine, appearances on popular television variety/talk shows and Walt Disney television specials, he detailed his ideas for space travel, which would ultimately lead to the construction of a permanently inhabited space station to be used to conduct scientific experiments and to serve as a base camp for launching missions to the Moon, Mars, and eventually other planets (Launius 2003:25-29). His ideas inspired young engineers, such as Heinz H. Koelle, Darrell C. Romick, and Krafft A. Ehricke, to develop their own concepts for space stations. For example, Ehricke, with the support of his employer, General Dynamics, proposed a "Minimum Manned Satellite" to the U.S. Air Force. Von Braun's team, now stationed at the Army Ballistic Missile Agency in Huntsville, Alabama, continued researching a large wheel-like station, named Project Horizon, that would serve as a refueling point for Moon-bound vehicles (Launius 2003:37-38). These concepts and designs, among others, were soon overshadowed by the work at Langley Research Center (LaRC) in Hampton, Virginia, an outpost of the newly-created NASA.

Less than one year after the formation of NASA, LaRC engineers held an in-house conference (July 1959), with the aim of "concentrating research efforts on developing the technology to build, launch and operate" a space station (Newkirk and Ertel 1977). Subsequently, throughout the early 1960s, they researched six different station concepts, ultimately developing a design for a modular space station that included large rigid modules linked by inflatable connectors. Using a low rotational velocity to simulate gravity, the outer portions of a non-rotating hub would provide a place for shuttle docking and a laboratory for experimentation (Launius 2003:40-43). In the meantime, von Braun's group in Huntsville, now part of the MSFC, continued to develop Project Horizon (Launius 2003:45-50). However, although President Kennedy's May 1961 challenge to land a man on the Moon by the end of the decade pulled NASA's focus towards the Apollo Program, proponents for a space station continued their studies, shifting their emphasis to developing a smaller and more economical station that built on the technological systems developed for Apollo. Engineers at LaRC, for example, furthered a station concept named the Manned Orbital Research Laboratory (MORL), which would support one astronaut full time for a year, with other crewmembers joining for shorter periods (Launius 2003:50-66). At JSC, engineers proposed a Large Orbiting Research Laboratory (LORL), or Olympus, which was roughly seven times the size of MORL and could carry a crew of 24 astronauts. Outside of NASA, other groups also pursued the idea of a manned orbiting satellite, including the U.S. Air Force, whose proposed Manned Orbiting Laboratory (MOL), was very similar to the MORL (Launius 2003:67-69).

By 1968, development of a space station had become NASA's leading post-Apollo goal, and in 1969, after the successive Apollo 11 Moon-landing mission, NASA's new space station paradigm, Space Base, was conceived. This permanent space station, envisioned as a home port to launch people and supplies to the Moon, was to be a laboratory for scientific and industrial experiments (NASA JSC 1997a). Scheduled for completion in 1975, it was designed for a 10-year operating life staffed by 50 to 100 engineers and technologists of varying background and nationality. However, given the projected project costs, especially those associated with using expendable rockets to resupply the station, NASA turned to an alternate plan - the development of a reusable spacecraft, which became the Space Shuttle. However, while development of the shuttle proceeded, NASA continued research into a scaled-down version of a space station.

RELEASED - Printed documents may be obsolete; validate prior to use.

Two key events occurred within U.S. politics between November 1980 and July 1981, which would ultimately set the country toward the goal of a permanent space station. First, while Ronald Reagan was preparing to take over as President of the U.S. following the 1980 election, George M. Low, a former NASA administrator and head of Reagan's space policy transition team, reported that NASA was "in an untenable position. . . . This unhealthy state of affairs can only be rectified by a conscious decision. Continuation of the prior administration's low level of interest and lack of clear direction would result in an unconscionable waste of human and financial resources" (Launius 2003:117). The second key moment came on June 1, 1981, when James M. Beggs was nominated by the President to be the new NASA administrator and officially entered the office on July 10. Although Low did not directly advocate for a space station, Beggs firmly stated during his confirmation hearings, "it seems to me that the next step is a space station" (Launius 2003:114).

Beggs, and many of his chief lieutenants, spent the next three years laying the foundation work for the approval of a space station program. He first tried to convince the administration's Senior Interagency Group for Space of the value of a station, but found that the majority of the members would not support it. Beggs then turned to the President and had the issue placed on the agenda for the December 1983 Cabinet Council on Commerce and Trade meeting. By circumventing the standard political channels, Beggs effectively appealed to Reagan's well known belief that the Soviet Union, or "evil empire," was a serious threat to the U.S. and democracy. At the time, various versions of the small Russian station, *Salyut*, had been orbiting around Earth for seven years. Subsequently, in his January 25, 1984, State of the Union Address, President Reagan directed NASA to develop a permanently manned space station and to do it within a decade. As a result, the U.S. Space Station Program officially began in January 1984. The program would be managed by a Space Station Program Office at JSC, established in April 1984, and overseen by the NASA Office of Space Station in Washington, D.C. (Launius 2003:118-121). The formal design work was divided between MSFC, JSC, Goddard Space Flight Center in Greenbelt, Maryland, and Lewis (later renamed Glenn) Research Center in Cleveland, Ohio, with each center responsible for designing specific elements of the station (*Spaceport News* 1984).

While the space program had the approval of the President, others, including the Secretary of Defense, had reservations about the cost and the impact the diversion of funds would have on the Space Shuttle Program. Cost estimates for the new Space Station Program ranged from highs of $12 to $20 billion. However, Beggs responded with an $8 billion dollar figure noting that since the program was modular, once the necessary pieces were in place, other sections of the station could be added as funds became available. While NASA was directed to stay within the budget, it was unable to do so and within five years the projected program costs had more than tripled (Launius 2003:121-123).

Although pressure from Congress to reduce the budget was constant, and the funds were never fully sufficient to support the project, designs for a space station were developed. Out of several initial design concepts, in April 1984, the Space Station Program Office at JSC produced the first baseline configuration, called the "Power Tower." It featured a central keel with a cluster of five modules at the lower end and a set of solar arrays at the upper end (Smith 2001:9-12). According to Launius, this concept "offered the most latitude to design a workable space station given political, funding, and technical limitations. [It also satisfied] the broadest range of scientific requirements and it offered the potential to minimize development costs" (Launius 2003:124).

By the spring of 1985, Japan, Canada, and the European Space Agency, each signed a Memorandum of Understanding with the United States to participate in the Space Station Program. Subsequently, the partners reached agreement on their hardware contributions (NASA JSC 1997a). As program costs continued to rise, and a broad public, scientific, and governmental consensus in support of the program still failed to be achieved, Congress directed NASA to redesign the space station. Although the new

RELEASED - Printed documents may be obsolete; validate prior to use.

design cut $8.3 million from the cost estimate, the U.S. House of Representatives held its first floor vote on whether to terminate the program in 1991. The program managed to survive, as it would for twenty-one additional Congressional votes held through the year 2000 (Smith 2001).

In the meantime, in February 1986, Russia launched its next generation space station, *Mir*, which would remain in orbit until March 2001. In 1991, President George H. W. Bush and Russian Premier Mikhail Gorbachev agreed that an American astronaut would reside on *Mir* and a Russian cosmonaut would fly on the Space Shuttle as part of the Manned Flight Joint Working Group (Launius 2003:155, 158-159; Reichardt 2002:85). The following year, a second agreement was made between the space agencies of the two countries, which outlined a plan for a U.S. Space Shuttle to dock with *Mir* and leave an American astronaut on board the station for a set period of time.

In 1993, NASA received a directive to develop once again a simpler design for the space station. The resultant design was a medium-sized, modular station that, in the words of President William Clinton, was chosen to "enhance and expand the opportunities for international participation in the Space Station Program, so that the space station can serve as a model of nations coming together in peaceful cooperation" (Launius 2003:179). In September 1993, President Clinton invited Russia to participate as a partner in the U.S. Space Station Program. Both countries signed an agreement, after which the station became known as the International Space Station (NASA JSC 1997a).

A proposed three-phase approach for the new International Space Station Program resulted from the summit. The first phase was the joint U.S./Russian, Shuttle-*Mir* Program, which was initiated with NASA's STS-60 mission, when Sergei Krikalev became the first Russian cosmonaut to fly on a Shuttle. During the Shuttle-*Mir* Program, the orbiter docked with *Mir* nine times. In 1995, Norman E. Thagard, M.D., became the first American astronaut to live aboard the Russian space station. Over the next three years, six more U.S. astronauts served tours on *Mir*. The Shuttle-*Mir* Program, which ended June 2, 1998, served to acclimate the astronauts to living and working in space, and many of the activities carried out on *Mir* were types they would perform on the ISS (Rumerman 2000:3).

The second phase of the International Space Station Program officially began with the commencement of the station's on-orbit assembly in November 1998, when *Zarya*, built by Russia and financed by the United States, was launched by a Russian Proton rocket from the Baikonur Cosmodrone in Kazakhstan (Launius 2003:185-187; NASA JSC 1999a). The U.S.-built *Unity* Node 1 connecting module, along with two pressurized mating adapters, was launched from Kennedy Space Center aboard *Endeavour* (STS-88) in December 1998. *Unity* was connected to the orbiting *Zarya* by the *Endeavour*'s crew on December 6, 1998. As noted by Ray A. Williamson, delivery of the first U.S.-built element to the station marked, "at long last the start of the Shuttle's use for which it was primarily designed – transport to and from a permanently inhabited orbital space station" (Williamson 1999:191). The twenty-sixth flight of *Discovery* (STS-96), launched on May 27, 1999, was the first mission to dock with the International Space Station.

A 19-month construction hiatus followed the mating of *Zarya* and *Unity*, because of Russian delays in building the *Zvezda* Service Module. Until delivery and installation of this key module, the International Space Station could not be inhabited without a Shuttle present. *Zvezda* finally was launched on July 11, 2000, and mated with *Zarya* and *Unity* on July 25th (NASA JSC 1999b). In October 2000, the crew of *Discovery* (STS-92) delivered and connected the Zenith Port Truss and the third pressurized mating adapter. Following this, the station was officially declared ready for occupancy. One month later, the Port 6 Truss, fitted with the first set of solar arrays, was launched by *Endeavour* (STS-97). The Port 6 Truss was temporarily installed on top of the Z-1 Truss to provide power to the station while the remainder of the integrated truss system was completed.

RELEASED - Printed documents may be obsolete; validate prior to use.

The next major component, the U.S.-built *Destiny* Laboratory Module, arrived in February 2001, aboard *Atlantis* (STS-98). The astronaut crew arriving aboard *Discovery* (STS-102) in March 2001, attached and unloaded the first Multi-Purpose Logistics Module, a pressurized compartment that carried equipment, experiments, and supplies to and from the station aboard the Shuttle. *Endeavour* (STS-100) delivered the Canadarm-2 in April 2001. Three months later, the Joint Airlock *Quest* arrived, which enabled the U.S. astronauts to perform spacewalks without the Space Shuttle present. On September 15, 2001, the Russian *Pirs* Docking Compartment was launched aboard a Russian spacecraft, and two Starboard Trusses were delivered aboard *Atlantis* (STS-110 and STS-112) in April and October 2002, respectively. These deliveries were followed by the Port 1 Truss in November 2002. At this point, approximately 45 percent of the station had been delivered and assembled.

Following the *Columbia* accident in February 2003, all access to and from the station was by way of the Russian-built Soyuz capsule. During the two-year period spanning 2003 to 2005, Russia flew fourteen resupply and crew rotation missions until STS-114 in 2005. Just over two years later, on March 2, 2006, the international partners approved a new assembly sequence for the International Space Station, which dedicated sixteen remaining Shuttle flights to launching space station elements. Three Port Truss and three Starboard Truss segments were delivered in 2006 and 2007. *Discovery* (STS-120) launched on October 23, 2007, carrying the Italian-built *Harmony* Node 2. The Japanese *Kibo* Experiment Module and European Space Agency-built *Columbus* Laboratory, as well as the Canadian-built robotic device *Dextre* arrived at the station in early 2008. The last major U.S. truss segment and the final pair of power-generating solar array wings were delivered to the station aboard *Discovery* (STS-119) in March 2009. The same year, the *Kibo* Japanese Experiment Module Exposed Facility and Experiment Logistics Module Exposed Section were delivered aboard *Endeavour* (STS-127).

In February 2010, the *Tranquility* Node 3 and its cupola, built by the Italian company Thales Alenia Space, were delivered aboard *Endeavour* (STS-130). By April 2010, following the conclusion of *Discovery's* (STS-131) mission, the non-Russian segment of the International Space Station was virtually complete. In May, *Atlantis* (STS-132) delivered the Russian-built Mini-Research Module 1 *Rassvet*; Mini-Research Module 2 *Poisk* was delivered earlier, in November 2009, aboard a Russian spacecraft. In February and May, 2011, *Discovery* (STS-133) and *Endeavour* (STS-134) delivered the final space station components: the permanent Multipurpose Module *Leonardo* and the Express Logistic Carrier 4 (STS-133), and the Express Logistic Carrier 3 and Alpha Magnetic Spectrometer 2 (STS-134). On July 21, 2011, *Atlantis* rolled to a stop at the Kennedy Space Center, marking the end of the final mission of the thirty-year old Space Shuttle Program. During mission STS-135, *Atlantis*, for the last time, delivered supplies and spare parts to sustain space station operations.

7.0 UNMANNED SPACE PROGRAMS

The Navy personnel and facilities associated with Project Vanguard were reassigned to NASA's planned space projects center in Greenbelt, Maryland. On May 1, 1959, NASA announced this new center would be designated as the Goddard Space Flight Center (Goddard). Twenty of these employees formed the Vanguard Group, which was responsible for launch operations of the vehicle at CCAFS. With the establishment of Goddard, this team became the Florida Launch Operations Division and remained here to oversee the remainder of the Vanguard launches. In May 1960, the group supported the launch of NASA's Delta-1, the first official Goddard-developed launch vehicle. This team, headed by Dr. Robert H. Gray, "provided the management and technical direction of the field efforts" for launch operations of various spacecraft; they also monitored and directed launch vehicle preparations and coordinated spacecraft checkout (NASA 2010).

RELEASED - Printed documents may be obsolete; validate prior to use.

Between its establishment and September 30, 1965, Goddard's Launch Operations Division oversaw fifty-five unmanned rocket launches at CCAFS, forty-seven of which were considered successful. Vehicles used included Vanguard; Thor-Able I, II, III, and IV; Delta; Delta A, B, C, and D; Atlas-Agena B and D; Atlas-Antares; Atlas-Centaur; and Titan III-C. The type of launch vehicle used was based on the weight of the payload, its orbital destination, and its purpose (Lethbridge 2014). Notable missions from this time period include:

- Explorer VI was launched from LC 5/6, Pad 5, August 7, 1959, aboard a Thor-Able III booster. Goddard considers this their first satellite, as all others up to this point were the "result of pre-NASA programs." Experiments and instrumentation aboard this spacecraft studied the Van Allen radiation belts, the Earth's magnetic field and cloud cover, micrometeoroids, and very low-frequency radio signals (Lethbridge 2014; Rosenthal 1968:79-80, 82).

- Tiros I was launched from LC 17, Pad A, on April 1, 1960, atop a Thor-Able II booster. It was the first U.S. meteorological satellite. During its seventy-eight day life, Tiros I took over 20,000 photographs depicting the Earth's cloud cover. Atmospheric characteristics such as jet streams, warm and cold fronts, and thunderstorms were depicted in many of the images (Lethbridge 2014; Rosenthal 1968:88- 89; NASA 2010).

- Ariel I was launched from LC 17, Pad A, on April 26, 1962, aboard a Delta rocket. It was a joint project of the U.S. and the United Kingdom, this first international satellite was equipped with instrumentation and experiments to study the solar atmosphere and ionosphere. It transmitted data to NASA through November 1963 (Lethbridge 2014; Rosenthal 1968:109-110).

- Telstar 1 was launched from LC 17, Pad B, on July 10, 1962, atop a Delta booster. It was the first active communications satellite, a product of the American Telephone and Telegraph Company (AT&T), and soon led to a debate in the U.S. Congress as to how such satellites would operate, by private industry, public utility, or governmental agency. Ultimately, this debate led to the "Communications Satellite Act of 1962," signed by President Kennedy on August 31 (Lethbridge 2014; Rosenthal 1968:79-80, 82).

- Mariner 2 was launched from LC 12, on August 27, 1962, aboard an Atlas-Agena B rocket. It was the first successful U.S. planetary probe. The probe came within 22,000 miles of Venus and provided the first scan of a planet other than Earth (Lethbridge 2014; NASA 2010).

- The Ranger 7 spacecraft, was launched from LC 12, July 28, 1964, atop an Atlas-Agena D. It was the first U.S. vehicle to impact the Moon. Prior to its landing, the spacecraft took over 4,000 photographs of the lunar surface, which NASA would use to plan its Apollo lunar landings (Lethbridge 2014; NASA 2010).

On October 1, 1965, NASA's east and west coast unmanned launch activities were formally transferred to KSC and consolidated as the Unmanned Launch Operations Directorate. While the management of the various unmanned programs remained at different NASA centers, this action effectively placed KSC in control of all NASA launches except for the Scout rockets. The group operated under the name Unmanned Launch Operations until 1985. During this twenty-year period, the team continued its mission of launching lunar and planetary spacecraft, and scientific, meteorological, and communications satellites. NASA's unmanned vehicles also helped maintain a U.S. presence in space during the void between the Apollo and Space Shuttle Programs. In the early years of the Space Shuttle Program, NASA's intent was to use the shuttle for all satellite launches, although this never happened (Barton and Levy 1984:20-27;

RELEASED - Printed documents may be obsolete; validate prior to use.

NASA, Public Affairs 1991). Some of the notable missions from this period include (unless otherwise noted, the specified launch complex/launch pad is at CCAFS):

- Surveyor 1 was launched from LC 36, Pad A, on May 30, 1966, aboard an Atlas-Centaur booster. This was the first U.S. spacecraft to make a soft landing on the Moon's surface; it relayed thousands of photographs to Earth, which NASA could use to plan the Apollo lunar landings (Lethbridge 2014; NASA 2010).

- LANDSAT 1 was launched from Space Launch Complex-2 West at Vandenberg Air Force Base (VAFB), California, on July 23, 1972, atop a Delta rocket. It was the first satellite to conduct a major assessment of the Earth's resources, such as agricultural, forest, mineral, and water, from space. NASA turned off the satellite in January 1978 (NASA 2010).

- Helios 1 was launched from LC 41, on December 10, 1974, aboard a Titan III-E Centaur. The satellite flew within the outer corona of the Sun to measure its density, temperature, velocity, and magnetic field. It continued to transmit data to NASA until 1985 (Lethbridge 2014; NASA 2010).

- The Viking 1 spacecraft was launched from LC 41 on August 20, 1975, atop a Titan III-E Centaur booster. This vehicle carried an orbiter, which it placed in orbit around Mars, and a lander that it sent to the planet's surface. The key goal was to find life on Mars (Lethbridge 2014; NASA 2010).

- The Pioneer Venus Orbiter was launched from LC 36, Pad A, on May 20, 1978, aboard an Atlas-Centaur rocket. This was the first satellite to orbit Venus. It studied the planet's atmosphere and surface, and compiled radar maps of its surface features (Lethbridge 2014; NASA 2010).

- The Infrared Astronomical Satellite was launched from Space Launch Complex-2 West at VAFB, on January 25, 1983, atop a Delta rocket. It was the satellite to conduct a detailed infrared examination of the universe. Results from its ten-month mission included the discovery of new stars being born and evidence of the possible evolution of new planetary systems (Lethbridge 2014; NASA 2010).

In 1985, the Unmanned Launch Operations Directorate became the Expendable Vehicle Operations Directorate; the group continued to fall under the jurisdiction of KSC. Its mission remained the same, and over the next several years the team would begin to provide launch services for commercial vehicles and payloads. In January 1983, President Ronald Reagan's administration had begun to encourage private industry to manufacture Expendable Launch Vehicles (ELVs) to deliver commercial payloads; Government launch facilities at KSC and VAFB would be made available for their use. Commercial development of space vehicles received a further boost following the Space Shuttle *Challenger* accident in January 1986, when NASA decided that the Space Shuttle would no longer deploy commercial satellites (NASA, Public Affairs 1991). The Expendable Vehicle Operations Directorate would operate as such until 1997. Some of the notable missions from this period are as follows:

- The SOHO (Solar and Heliospheric Observatory) satellite was launched from LC 36, Pad B, on December 3, 1995, aboard an Atlas IIAS-Centaur booster. This spacecraft gathered data on the internal structure and outer atmosphere of the Sun, as well as the origin of the solar wind (Lethbridge 2014; NASA 2010).

RELEASED - Printed documents may be obsolete; validate prior to use.

- The NEAR (Near Earth Asteroid Rendezvous) Shoemaker was launched from LC 17, Pad B, on February 17, 1996, atop a Delta II rocket. It was the first satellite to conduct a long-term, close-up examination of an asteroid's surface; its mission lasted one year (NASA 2010).

- The Mars Pathfinder vehicle was launched from LC 17, Pad B, on December 4, 1996, aboard a Delta II rocket. The vehicle carried a small robotic rover, the *Sojourner*, to Mars so it could study the planet's surface and record data about its ancient rocks (Lethbridge 2014; NASA 2010).

- The Cassini spacecraft was launched from LC 40, on October 15, 1997, atop a Titan IV-B booster. Cassini performed gravity-assisted flybys of Venus and Jupiter, before arriving at Saturn in July 2004 to observe the planet and its moons. This vehicle also carried the European Space Agency's Huygens probe, which was deployed to Titan, Saturn's largest moon (Lethbridge 2014; NASA 2010, 2013).

In 1997, NASA consolidated its ELV Program at KSC, naming it the lead center for the acquisition and management of ELV launch services. Per this announcement, KSC assumed the role of coordinating the requirements for all ELV customers, in addition to continuing to conduct launch operations. In 1998, the ELV Program merged with the Payload Carriers Program as a single program office at KSC; at this time, an ELV Launch Services Division was created. In 2003, the ELV & Payload Carriers Program Office was renamed the Launch Services Program; it retained its core functions of acquiring and managing ELV missions. Circa 2014, the Launch Services Program was using a mixed fleet of vehicles, some developed by private contractors (Pegasus XL, Falcon 1, Falcon 9, and Taurus XL), and others that are upgraded versions of old NASA/military rockets (Delta and Atlas) (NASA 2012, 2013). Some of the notable missions since 1998 include:

- The Mars Exploration Rovers *Spirit* and *Opportunity* were launched from LC 17, Pad A, on June 10, 2003, and from LC 17, Pad B, on July 6, 2003, respectively, atop Delta II rockets. These two vehicles landed at different locations on Mars and have provided additional data about the planet's surface (Lethbridge 2014; NASA 2010).

- The Space Infrared Telescope Facility (Spitzer Space Telescope) was launched from LC 17, Pad B, on August 25, 2003, aboard a Delta II rocket booster. This telescope was the fourth of NASA's "Great Observatories," the others being Hubble Space Telescope, the Compton Gamma Ray Observatory, and the Chandra X-Ray Observatory, and the only one delivered to space by an expendable vehicle; the others were carried aboard one of the Space Shuttles. The mission of this telescope is to obtain images through the detection of infrared energy (heat) radiated by objects in space (Lethbridge 2014; NASA 2010).

- The MESSENGER spacecraft was launched from LC 17, Pad B, on August 3, 2004, aboard a Delta II rocket. It is the first vehicle to orbit and map Mercury (Lethbridge 2014; NASA 2010).

- The New Horizons vehicle launched from LC 41 on January 19, 2006, atop an Atlas V rocket, is traveling to the edge of our solar system. Its goal is to explore the composition of Pluto and its moon (Charon), and study the Kuiper Belt, which consists of ancient icy bodies that orbit beyond Neptune (Lethbridge 2014; NASA 2010).

- The Kepler spacecraft was launched from LC 17, Pad B, on March 6, 2009, aboard a Delta II booster. Its mission is to search for Earth-size and smaller planets that orbit around other stars.

RELEASED - Printed documents may be obsolete; validate prior to use.

The focus is on the habitable zone, where liquid water may exist on the surface of such planets (Lethbridge 2014; NASA 2010).

- The Mars Science Laboratory, carrying the *Curiosity* rover, was launched from LC 41, on November 26, 2011, atop an Atlas V rocket. The goals of the mission, which is part of the Mars Exploration Program, are to help determine if life ever existed on Mars, characterize the climate and geology of the planet, and prepare for human exploration (Lethbridge 2014; NASA, Jet Propulsion Laboratory 2014).

- The MAVEN spacecraft was launched from LC 41, on November 18, 2013, aboard an Atlas V booster, is part of the Mars Exploration Program. The spacecraft will study the planet's upper atmosphere. Scientists hope to use the data to explain how Mars' climate has changed due to the loss of atmospheric gases (Lethbridge 2014; NASA 2014).

RELEASED - Printed documents may be obsolete; validate prior to use.

REFERENCES AND BIBLIOGRAPHY

Books, Pamphlets, and Journals

Advisory Council on Historic Preservation. *Balancing Historic Preservation Needs with the Operation of Highly Technical or Scientific Facilities*. Washington, D.C.: Advisory Council on Historic Preservation. 1991.

Advisory Council on Historic Preservation. *Consideration of Highly Technical and Scientific Facilities in the Section 106 Process*. Washington, D.C.: Advisory Council on Historic Preservation. 1995.

Allen, Peter. Letter to Elizabeth Ann Brown, Deputy SHPO, RE: MSFC Neutral Buoyancy Facility, 21 August 2001. Ralph Allen's office, MSFC, Building 4750, Room 14.

Anonymous. *Facts: John F. Kennedy Space Center*. 1994.

Baker, David. "A Schedule for the Shuttle." *Spaceflight* Volume 13, No. 12, December 1971:454-455.

Baker, David. "Evolution of the Space Shuttle Part 1." *Spaceflight* Volume 15, No. 6, June 1973a:202-210.

Baker, David. "A Chronology of the Space Shuttle." *Spaceflight* Volume 15, No. 6, June 1973b:210-214.

Baker, David. "Evolution of the Space Shuttle." North American Rockwell - Part 2. *Spaceflight* Volume 15, No. 7, July 1973c:264-268.

Baker, David. "A Chronology of the Space Shuttle - 2." *Spaceflight* Volume 15, No. 7, July 1973d:268-270.

Baker, David. "A Chronology of the Space Shuttle - 3." *Spaceflight* Volume 15, No. 8, August 1973e:312-314, 319.

Baker, David. "Evolution of the Space Shuttle. North American Rockwell - Part 3." *Spaceflight* Volume 15, No. 9, September 1973f:344-352.

Baker, David. "A Chronology of the Space Shuttle - 4." *Spaceflight* Volume 17, Nos. 8- 9, August-September 1975:335-337.

Baker, David. "A Chronology of the Space Shuttle - 5." *Spaceflight* Volume 18, No. 1, January 1976:23-25.

Baker, David. "A Chronology of the Space Shuttle – 5 (continued)." *Spaceflight* Volume 18, Nos. 7-8, July-August 1976:294-298.

Baker, David. "Evolution of the Space Shuttle Part 4." *Spaceflight* Volume 18, No. 9, September 1976:304-338.

Baker, David. "Evolution of the Space Shuttle Part 5. Approach and Landing Test Program." *Spaceflight* Volume 19, No. 6, June 1977:213-217.

RELEASED - Printed documents may be obsolete; validate prior to use.

Baker, David. "Evolution of the Space Shuttle Part 6. Free Flight Tests Begin." *Spaceflight* Volume 20, No. 1, January 1978:21-28, 40.

Baker, David. "Evolution of the Space Shuttle Part 7. External Tank Design - 1." *Spaceflight* Volume 20, No. 2, February 1978:60-66.

Baker, David. "Evolution of the Space Shuttle Part 8. External Tank Design - 2." *Spaceflight* Volume 20, No. 3, March 1978:110-115.

Benson, Charles D. and William B. Faherty. Gateway to the Moon: Building the Kennedy Space Center Launch Complex and Moon Launch! A History of the Saturn-Apollo Launch Operations. Gainesville: University Press of Florida. 2001.

Biggs, Robert E. "Space Shuttle Main Engine, The First Ten Years." In *History of Liquid Rocket Engine Development in the United States, 1955-1980*. American Aeronautical Society History Series, Volume 13, Stephen E. Doyle, editor, Part 3, Chapter 4, 69-122. 1992.

Boeing. *Space Exploration – Palmdale, CA: AF Plant 42, Site 1 North*. Palmdale: Boeing, 2006.

Bromberg, Joan Lisa. *NASA and the Space Industry*. Baltimore: Johns Hopkins University Press. 1999.

Brooks, Courtney G., James M. Grimwood, and Loyd S. Swenson, Jr. *Chariots for Apollo: The NASA History of Manned Lunar Spacecraft to 1969.* Mineola, NY: Dover Publications, Inc., 2009.

Burrows, William E. *This New Ocean, The Story of the First Space Age*. New York: Random House. 1998.

Catchpole, John. *Project Mercury: NASA's First Manned Space Programme*. Chichester: Praxis Publishing Limited, 2001.

Dethloff, Henry C. *Suddenly, Tomorrow Came…A History of the Johnson Space Center*. The NASA History Series. Houston: Johnson Space Center. 1993.

Dethloff, Henry C. "The Space Shuttle's First Flight: STS-1." *From Engineering Science to Big Science: The NASA and NASA Collier Trophy Research Project Winners*. NASA SP-4219, Edited by Pamela E. Mack, Washington, D.C.: Government Printing Office. 1998.

Dunar, Andrew J. and Stephen P. Waring. *Power to Explore: A History of Marshall Space Flight Center 1960-1990*. Washington, D.C.: NASA. 1999.

Ezell, Linda Neuman. *NASA Historical Databook Volume III Programs and Projects 1969-1978.* The NASA History Series, NASA SP-4012, Washington, D.C.: NASA History Office. 1988.

Godwin, Robert. *Project Apollo: The Test Program.* Burlington, Ontario: Apogee Books, 2006a.

Godwin, Robert. *Project Apollo: Exploring the Moon.* Burlington, Ontario: Apogee Books, 2006b.

Green, Barbara E. *25th Anniversary United States Space Shuttle Firsts.* NASA, Kennedy Space Center Library Archives, KSC Historical Report 19. April 2006.

RELEASED - Printed documents may be obsolete; validate prior to use.

Guilmartin, Jr., John F. and John Walker Mauer, "A Shuttle Chronology 1964---1973 Abstract Concepts to Letter Contracts," December 1988, Sweetsir Collection, Box 45E.3N1, Folder 90-16, Kennedy Space Center Archives.

Hacker, Barton C. and James M. Grimwood. *On the Shoulders of Titans: A History of Project Gemini.* Washington, DC: NASA, Office of Scientific and Technical Information, 1977.

Hallion, Richard P. and Michael H. Gorn. *On the Frontier: Experimental Flight at NASA Dryden*. 2nd Edition. Washington and London: Smithsonian Books. 2003.

Harland, David M. *The Story of the Space Shuttle*. Chichester, United Kingdom: Praxis Publishing. 2004.

Heppenheimer, T. A. *Countdown, A History of Space Flight.* New York: John Wiley and Sons, Inc. 1997.

Heppenheimer, T. A. *The Space Shuttle Decision: NASA's Search for a Reusable Space Vehicle.* NASA SP-4221. Volume One of *History of the Space Shuttle*, Washington, D.C.: Smithsonian Institution Press. 2002a.

Heppenheimer, T. A. *Development of the Space Shuttle, 1972-1981*. Volume Two of *History of the Space Shuttle*, Washington, D.C.: Smithsonian Institution Press. 2002b.

Hickam, Homer H., Jr. "Charlie and the Aquanauts." *Air & Space*, June/July 1993:47-53.

Jenkins, Dennis R. *Space Shuttle, The History of the National Space Transportation System. The First 100 Missions*. Cape Canaveral, Florida: Specialty Press. 2001.

Kraft, Chris. *Flight, My Life in Mission Control*. New York: Penguin Putnum Inc., 2001.

Kranz, Gene. *Failure Is Not An Option*. New York: Berkley Publishing Group, 2000.

Launius, Roger D. S*pace Stations, Base Camps to the Stars.* Washington, DC: Smithsonian Institution, 2003.

Launius, Roger D. and Aaron K. Gillette. *Toward a History of the Space Shuttle: An Annotated Bibliography.* Washington, D.C.: NASA History Office, Studies in Aerospace History Number 1. 1992.

Logsdon, John M., Ray A. Williamson, Roger D. Launius, Russell J. Acker, Stephen J. Garber, and Jonathan L. Friedman (Editors). *Exploring the Unknown: Selected Documents in the History of the U.S. Civil Space Program Volume IV: Accessing Space*. NASA SP-4407. Washington, D.C.: Government Printing Office. 1999.

Milbrooke, Anne, with Patrick Andrus, Jody Cook, and David B. Whipple. *National Register Bulletin, Guidelines for Evaluating and Documenting Historic Aviation Properties.* Washington, D.C.: National Park Service. 1998.

NASA. *America's Spaceport.* Kennedy Space Center: NASA, 2010.

NASA. *Facts: John F. Kennedy Space Center*, 1994.

RELEASED - Printed documents may be obsolete; validate prior to use.

NASA. *NASA's Launch Services Program.* Kennedy Space Center: NASA, 2013.

NASA, Headquarters, "Evaluating Historic Resources Associated with the Space Shuttle Program: Criteria of Eligibility for Listing in the National Register of Historic Places." May 8, 2006.

NASA, Headquarters, "Evaluating Historic Resources Associated with the Space Shuttle Program: Evaluation Protocol for Using the Criteria of Eligibility for Listing in the National Register of Historic Places." May 10, 2006.

NASA, Johnson Space Center, *Space Shuttle End-State Subsystems Requirements Document.* Houston: Johnson Space Center, 2010.

NASA, Marshall Space Flight Center. NASA Facts "Space Shuttle Main Engine Turbopump." FS-2005-04-026-MSFC. April 2005.

National Aeronautics and Space Administration Authorization Act of 2010, 111th Congress, 2d session (October 11, 2010).

National Park Service (NPS). *National Register Bulletin 16B: How to Complete the National Register Multiple Property Documentation Form*. Washington, D.C.: National Park Service. 1991.

NPS. *National Register Bulletin: How to Apply the National Register Criteria for Evaluation*. Washington, D.C.: National Park Service. 1997.

Nesbitt, Steve. "STS-26 Astronaut Crew to Participate in 56-hour Simulation." NASA News Release No. 87-047, NASA JSC. 16 October 1987.

Reichhardt, Tony (editor). *Space Shuttle, The First 20 Years*. Washington, D.C.: Smithsonian Institution. 2002.

Rosenthal, Alfred. *Venture into Space: Early Years of Goddard Space Flight Center.* Washington, DC: NASA, Office of Technology Utilization, 1968.

Rumerman, Judy A., with Stephen J. Garber. *Chronology of Space Shuttle Flights 1981-2000*. HHR-70. Washington, D.C.: NASA History Division, Office of Policy and Plans. October 2000.

Rumerman, Judith A. with Chris Gamble and Gabriel Okolski. *U.S. Human Spaceflight, A Record of Achievement, 1961-2006.* Washington, DC: NASA History Office, 2007.

Shergy, Marcella and W. Ray Luce. *National Register Bulletin 22: Guidelines for Evaluating and Nominating Properties that have Achieved Significance Within the Last Fifty Years*. Washington, D.C.: National Park Service. 1996.

Spires, David N. "The Air Force and Military Space Missions: The Critical Years, 1957-1961" in *The U.S. Air Force in Space: 1945 to the 21st Century*, Proceedings of the Air Force Historical Foundation Symposium, Andrews AFB, Maryland, September 21-22, 1995, edited by R. Cargill Hall and Jacob Neufeld, 33-45. Washington, D.C.: USAF History and Museums Program, USAF. 1998.

RELEASED - Printed documents may be obsolete; validate prior to use.

Swenson, Loyd S., Jr., James M. Grimwood and Charles C. Alexander. *This New Ocean: A History of Project Mercury*. Washington, D.C.: NASA, Office of Technology Utilization, 1966.

U.S. House, Committee on Science and Technology, Subcommittee on Space Science and Applications. *United States Civilian Space Programs, 1958-1978*. Washington, DC: U.S. Printing Office, 1981.

United States Senate. Committee on Appropriations. Subcommittee on Military Construction. *Staff Report: Military Construction Activities Vandenberg Space Shuttle Facility*. June 1986.

Veris, S. Jenise. "2001 Columbia celebrates 20 years of service." *AeroSpace Frontiers*, April 2001:7.

Williamson, Ray A. "Developing the Space Shuttle." *Exploring the Unknown: Selected Documents in the History of the U.S. Civil Space Program, Volume IV: Accessing Space*. Edited by John M. Logsdon. Washington, D.C.: U.S. Printing Office. 1999.

Wright, Mike, with Bob Jaques. *Towards Liftoff: A Brief History and Chronology of the Marshall Space Flight Centers' Role in Designing, Developing, and Testing the Space Shuttle Propulsion Elements for STS-1*. Huntsville: Marshall Space Flight Center. 2001.

Cultural Resource Inventories and Historic Contexts

Archaeological Consultants, Inc. (ACI). *Survey and Evaluation of the Historic Facilities within the Industrial, Launch Complex 39 (LC-39), Vehicle Assembly Building (VAB), and Shuttle Landing Facility (SLF) Areas of the John F. Kennedy Space Center (KSC), Brevard County, Florida, with a Reassessment of the Existing National Register of Historic Places LC-39 Site*, NASA KSC. 1998.

ACI. *NASA-wide Survey and Evaluation of Historic Facilities and Properties in the Context of the U.S. Space Shuttle Program, Lyndon B. Johnson Space Center, Texas.* November 2007a.

ACI. *NASA-wide Survey and Evaluation of Historic Facilities and Properties in the Context of the U.S. Space Shuttle Program, White Sands Test Facility, Las Cruces, New Mexico*. November 2007b.

ACI. *NASA-wide Survey and Evaluation of Historic Facilities and Properties in the Context of the U.S. Space Shuttle Program, John H. Glenn Research Center at Lewis Field, Cleveland and Plum Brook Station, Sandusky, Ohio*. November 2007c.

ACI. *NASA-wide Survey and Evaluation of Historic Facilities and Properties in the Context of the U.S. Space Shuttle Program, John F. Kennedy Space Center, Brevard County, Florida*. November 2007d.

ACI and Weitze Research. *NASA-wide Survey and Evaluation of Historic Facilities and Properties in the Context of the U.S. Space Shuttle Program, Dryden Flight Research Center, California*. November 2007a.

ACI and Weitze Research. *NASA-wide Survey and Evaluation of Historic Facilities and Properties in the Context of the U.S. Space Shuttle Program, Canoga Park Facility, Canoga Park, California. November* 2007b.

RELEASED - Printed documents may be obsolete; validate prior to use.

ACI and Weitze Research. *NASA-wide Survey and Evaluation of Historic Facilities and Properties in the Context of the U.S. Space Shuttle Program, Santa Susana Field Laboratory, Ventura County, California*. November 2007c.

ACI and Weitze Research. *NASA-wide Survey and Evaluation of Historic Facilities and Properties in the Context of the U.S. Space Shuttle Program, Marshall Space Flight Center, Huntsville, Alabama*. November 2007d.

ACI and Weitze Research. *NASA-wide Survey and Evaluation of Historic Facilities and Properties in the Context of the U.S. Space Shuttle Program, Air Force Plant 42, 1 North, Palmdale, California*. November 2007e.

Barton, David and Richard S. Levy. *An Architectural and Engineering Survey and Evaluation of Facilities at Cape Canaveral Air Force Station, Brevard County, Florida.* Resource Analysts, Inc., March 16, 1984.

Butowsky, Harry A. *Reconnaissance Survey: Man in Space*. Washington, D.C.: National Park Service. 1981.

Butowsky, Harry. *Man in Space National Historic Landmark Theme Study*. Washington, D.C.: National Park Service. 1984.

Cleveland, M. Todd. *Evaluation of Resources Associated with the Space Shuttle Program, Michoud Assembly Facility, New Orleans, Louisiana*. TRC, Atlanta, Georgia. May 2007.

Page & Turnbull, Inc. *Space Shuttle Program NASA Ames Research Center Moffett Field, California.* February 23, 2007.

Science Applications International Corporation. *Space Shuttle Program Historic Eligibility Survey Report for NASA Langley Research Center, Hampton, Virginia*. November 2006.

Stennis Space Center. *Shuttle Survey Historic Eligibility Report for the Stennis Space Center, Hancock County, Mississippi*. April 2007.

Weitze, Karen J. *Historical Assessment for the Equipment Boneyards Marshall Space Flight Center*. San Diego: EDAW, Inc. and Weitze Research. October 2004.

Internet Resources

American Society of Mechanical Engineers (ASME). "National Historic Mechanical Engineering Landmark. Crawler Transporters of Launch Complex 39, Kennedy Space Center, February 3, 1977." http://files.asme.org/ASMEORG/Communities/History/Landmarks/5522.pdf.

Bergin, Chris. "Discovery's Elaborate Deservicing Plan Put Into Work Amid Managerial Praise." March 14, 2011. http://www.nasaspaceflight.com/2011/03/discoverys-deservicing-plan-work-amid-praise/.

Braukus, Michael and June Malone. "Shuttle Super Lightweight Fuel Tank Completes Test Series." NASA, July 1996. http://findarticles.com/p/articles/mi_pasa/is_199607/ai_238988282.

RELEASED - Printed documents may be obsolete; validate prior to use.

Brooks, Courtney G., and Ivan D. Ertel. *The Apollo Spacecraft: A Chronology, Volume 3*. Washington, D.C.: NASA, Scientific and Technical Information Office, 1973. http://www.hq.nasa.gov/office/pao/History/SP-4009/cover.htm.

Columbia Accident Investigation Board. *Report Volume I*, August 2003. http://spaceflight.nasa.gov/shuttle/archives/sts-107/investigation/CAIB_lowres_ full.pdf.

Columbia Accident Investigation Board. "Orbiter Major Modification Review." http://www.nasa.gov/Columbia/caib/PDFS/VOL2/D14.PDF. October 2003.

Dismukes, Kim. "STS-103 Payloads Servicing Mission 3A Configuration." Updated April 4, 2002. http://spaceflight.nasa.gov/shuttle/archives/sts-103/cargo/ index.html.

Dumoulin, Jim. "Pathfinder." Last updated June 7, 1995. http://science.ksc.nasa.gov/shuttle/resources/orbiters/pathfinder.html.

Ertel Ivan D. and Mary Louise Morse. *The Apollo Spacecraft: A Chronology, Volume 1*. Washington, DC: NASA, Scientific and Technical Information Office, 1969. http://www.hq.nasa.gov/office/pao/History/SP-4009/contents.htm#Volume%20I.

Ertel, Ivan D. and Roland W. Newkirk (with Courtney G. Brooks). *The Apollo Spacecraft: A Chronology, Volume 4*. Washington, DC: NASA, Scientific and Technical Information Office, 1978. http://www.hq.nasa.gov/office/pao/History/SP-4009/contents.htm#Volume%20IV.

Garber, Stephen J. "The Flight of STS-1." 2005. http://history.nasa.gov/sts1/

Gebhardt, Chris. "*Endeavour* and *Discovery* swap places—New Retirement Dates Planned." August 11, 2011. http://www.nasaspaceflight.com/2011/08/endeavour-discovery-swap-places-new-retirement-dates-planned/.

Grimwood, James M. *Project Mercury: A Chronology*. Washington, D.C.: NASA, Office of Scientific and Technical Information, 1963. http://history.nasa.gov/SP-4001/cover.htm.

Grimwood, James M. and Barton C. Hacker (with Peter J. Vorzimmer). *Project Gemini Technology and Operations, A Chronology*. Washington, D.C.: NASA, Scientific and Technical Information Office, 1969. http://history.nasa.gov/SP-4002/contents.htm.

Jue, Fred H., Space Shuttle Main Engine – Thirty Years of Innovation. The Boeing Company. No date http://www.engineeringatboeing.com/dataresources/SpaceShuttleMainEngineThirtyYearsofInnovation.doc.

Lethbridge, Clifford J. "Cape Canaveral Launch Vehicles Box Score." *Spaceline.org*. 2014. http://www.spaceline.org/statistics/Cape_Canaveral_Launch_Vehicles_Box_Score.html.

Lethbridge, Cliff. "STS-1 Fact Sheet." 1998. http://spaceline.org/shuttlechron/shuttle-sts1.html.

Lethbridge, Cliff. "History of the Space Shuttle Program." 2001. http://spaceline.org/rocketsum/shuttle-program.html.

RELEASED - Printed documents may be obsolete; validate prior to use.

Levine, Jay. "Inside Atlantis Modifications and Maintenance Near End in Palmdale." The X-Press, September 18, 1998:4. http://www.dfrc.nasa.gov/Newsroom/X-Press/1998/Sep18-TX/page4-TX.html.

Lindroos, Marcus. "President Nixon's 1972 Announcement on the Space Shuttle." NASA Office of Policy and Plans, NASA History Office, updated April 14, 2000. http://history.nasa.gov/stsnixon.htm.

Lockheed Martin Space Systems. "Space Shuttle Flight Information. 26 Years of Space Shuttle Flights." Updated August 2007. www.lockheedmartin.com/data/assets/ssc/michoud/8-14-07ShuttleFlightInfo.pdf.

Morse, Mary Louise and Jean Kernahan Bays. *The Apollo Spacecraft: A Chronology, Volume 2.* Washington, DC: NASA, Scientific and Technical Information Office, 1973. http://www.hq.nasa.gov/office/pao/History/SP-4009/contents.htm#Volume%20II.

NASA. *NASA Shuttle Reference Manual*. 1988. http://spaceflight.nasa.gov/shuttle/reference/shutref/index.html.

NASA, History Office. "Report of the Space Task Group, 1969." http://www.hq.nasa.gov/office/pao/History/taskgrp.html.

NASA. "Glass Cockpit." http://www.nasa.gov/centers/langley/news/factsheets/Glasscockpit.html.

NASA. "Human Space Flight – The Shuttle. Background and Status." http://spaceflight.nasa.gov/shuttle/reference/shutref/sts/background.html.

NASA. "Future Missions – Launch Schedule." http://www.nasa.gov/missions/highlights/schedule.html.

NASA. Launch Services Program: Earth's Bridge to Space. Kennedy Space Center: NASA, 2012. http://www.nasa.gov/sites/default/files/files/LSP_Brochure_508.pdf.

NASA. "Mission Chronology." http://www-pao.ksc.nasa.gov/shuttle.

NASA. "NASA Shuttle Mission Archives, STS-107." http://www.nasa.gov/mission_pages/shuttle/shuttlemissions/archives/sts-107.html.

NASA. "Space Shuttle Orbiter Systems Thermal Protection System." In NASA Shuttle Reference Manual, 1988. http://science.ksc.nasa.gov/shuttle/technology/sts-newsref/sts_sys.html.

NASA. "The External Tank." http://www.nasa.gov/returntoflight/system/system_ET.html.

NASA. "The MAVEN Mission." Accessed May 13, 2014. http://www.nasa.gov/content/maven-launch/index.html#.U3JLFyhcZQX.

NASA, Headquarters. "The Vision for Space Exploration." February 2004. http://history.nasa.gov/Vision_for_Space_Exploration.pdf.

RELEASED - Printed documents may be obsolete; validate prior to use.

NASA, Jet Propulsion Laboratory. "Mars Scientific Laboratory Curiosity Rover." Accessed May 13, 2014. http://mars.jpl.nasa.gov/msl/.

NASA, JSC. *A History of U.S. Space Stations.* NASA Facts. Houston: Johnson Space Center, 1997a. http://spaceflight.nasa.gov/spacenews/factsheets/pdfs/history.pdf.

NASA, JSC. *Apollo 11 Spacecraft Commentary*. July 16-24, 1969. http://www.jsc.nasa.gov/history/mission_trans/AS11_PAO.PDF.

NASA, JSC. *The Service Module: A Cornerstone of Russian International Space Station Modules*. NASA Facts. Houston: Johnson Space Center, 1999. http://spaceflight.nasa.gov/spacenews/factsheets/pdfs/servmod.pdf.

NASA, JSC. *The Zarya Control Module: The First International Space Station Component to Launch*. NASA Facts. Houston: Johnson Space Center, 1999. http://spaceflight.nasa.gov/spacenews/factsheets/pdfs/zarya.pdf.

NASA, KSC. "1981-1999 Space Shuttle Mission Chronology." http://www.nasa.gov/centers/kennedy/pdf/167716main_1981-99Volume1.pdf.

NASA KSC. "Apollo 11." *Apollo website*. 2003. http://www-pao.ksc.nasa.gov/kscpao/history/apollo/apollo-11/apollo-11.htm;

NASA KSC. "Gemini Goals." 2000. http://www-pao.ksc.nasa.gov/kscpao/history/gemini/gemini-goals.htm.

NASA, KSC. "KSC Press Release 113-94 and Shuttle Status Report 10/10/94." http://science.ksc.nasa.gov/shuttle/resources/orbiters/columbia\html.

NASA, KSC. "The MILA Spaceflight Tracking and Data Network." NASA Facts, FS-2005-03-009-KSC (Rev. 2006). http://www-pao.ksc.nasa.gov/kscpao/nasafact/pdf/MILA-06.pdf.

NASA, KSC. NASA News Release On Line, KSC Release No. 94-95. "Discovery Scheduled to Depart KSC for Orbiter Modifications in Palmdale, California." September 22, 1995. http://www-pao.ksc.nasa.gov/kscpao/release/1995/94-95.htm.

NASA, MSFC. "Super Lightweight External Tank." NASA Facts, April 2005.FS-2005-04-025-MSFC. http://www.nasa.gov/centers/marshall/pdf/113020main_shuttle_lightweight.pdf

NASA, MSFC. "NASA Extends Shuttle External Tank Contract with Lockheed Martin to September 2008." NASA News Release, MSFC Release # 02-150, 6/12/02. http://www.msfc.nasa.gov/news/news/releases/2002/02-150.html

NASA, MSFC. "Space Shuttle External Tank ET-128, STS-124." NASA Facts, FS-2008-05-87-MSFC. http://www.nasa.gov/centers/marshall/pdf/228641main_8-368946(2).pdf

NASA, Public Affairs. *The Kennedy Space Center Story.* Kennedy Space Center: NASA, 1991. http://www.nasa.gov/centers/kennedy/about/history/story/ch2.html.

RELEASED - Printed documents may be obsolete; validate prior to use.

NASA, Stennis Space Center (SSC). "Chronology of Significant Events." Last updated October 5, 2007. http://www.nasa.gov/centers/stennis/about/history/chronology/chronology.html

Newkirk, Roland W. and Ivan D. Ertel (with Courtney G. Brooks). *Skylab: A Chronology*. Washington, DC: NASA, 1977. http://history.nasa.gov/SP-4011/cover.htm.

NPS. "National Historic Landmarks Program." No date. http://www.nps.gov/nhl/QA.htm.

"President Obama Signs NASA Space Exploration Act Into Law." *FoxNews.com*. October 12, 2010.

Presidential Commission on the Space Shuttle Challenger Accident (Rogers Commission). *Report, Volume I*. Washington, DC: U.S. Government Printing Office, 1986a. http://history.nasa.gov/rogersrep/genindex.htm.

Presidential Commission on the Space Shuttle Challenger Accident (Rogers Commission). *Report, Volume II*. Washington, DC: U.S. Government Printing Office, 1986b. http://history.nasa.gov/rogersrep/genindex.htm.

Presidential Commission on the Space Shuttle Challenger Accident (Rogers Commission). *Report, Volume III*. Washington, DC: U.S. Government Printing Office, 1986c. http://history.nasa.gov/rogersrep/genindex.htm.

Presidential Commission on the Space Shuttle Challenger Accident (Rogers Commission). *Report, Volume IV*. Washington, DC: U.S. Government Printing Office, 1986d. http://history.nasa.gov/rogersrep/genindex.htm.

Presidential Commission on the Space Shuttle Challenger Accident (Rogers Commission). *Report, Volume V*. Washington, DC: U.S. Government Printing Office, 1986e. http://history.nasa.gov/rogersrep/genindex.htm.

Roberts, William J. Interview by Jennifer Ross-Nazzal. *NASA STS Recordation Oral History Project*. August 25, 2010. http://www.jsc.nasa.gov/history/oral_histories/STS-R/RobertsWJ/robertswj.htm.

Smith, Marcia. "NASA's Space Station Program: Evolution and Current Status. Testimony before the House Science Committee." April 4, 2001. http://www.hq.nasa.gov/office/pao/History/smith.htm.

"Space Shuttle Pathfinder." Last modified December 11, 2006. http://en.wikipedia.org/wiki/Space_Shuttle_Pathfinder.

Taylor, Henry. Interview by Jennifer Ross-Nazzal. *NASA STS Recordation Oral History Project*. August 26, 2011. http://www.jsc.nasa.gov/history/oral_histories/STS-R/TaylorHT/taylorht.htm.

Weaver, David "NASA Announces New Homes For Shuttle Orbiters After Retirement." NASA Headquarters news release #11-107, April 12, 2011. http://www.nasa.gov/home/hqnews/2011/apr/HQ_11-107_Orbiter_Disposition.html.

Weekly Compilation of Presidential Documents (WCPD). Remarks at the National Aeronautics and Space Administration, Vol. 40, Issue 3 (January 19, 2004). http://www.gpo.gov/fdsys/pkg/WCPD-2004-01-19/content-detail.html.

RELEASED - Printed documents may be obsolete; validate prior to use.

Wells, Helen T., Susan H. Whiteley, and Carrie E. Karegeannes. *Origins of NASA Names*. The NASA History Series, SP-4402, NASA History Office, Washington, D.C. 1976. http://history.nasa.gov/SP-4402/ch6.htm.

Whalen, Jessie E. and Sarah L. McKinley. "Chronology: MSFC Space Shuttle Program Development, Assembly, and Testing Major Events (1969-April 1981)." Huntsville, AL: MSFC Management Operations Office, December 1988. http://ntrs.nasa.gov/archive/nasa/casi.ntrs.nasa.gov/19910005807_1991005807.pdf.

Williams, Walter C., Kenneth S. Kleinknecht, William M. Bland, Jr., and James E. Bost. "Project Review." *Mercury Project Summary Including the Results of the Fourth Manned Orbital Flight, May 15 and 16, 1963 [SP-45]*. Washington, D.C.: NASA, Office of Scientific and Technical Information, 1963, 1-31.

RELEASED - Printed documents may be obsolete; validate prior to use.

APPENDIX C: Original NRHP Nomination for the LC-39 Site

RELEASED - Printed documents may be obsolete; validate prior to use.

Form 10-300 (1959)

UNITED STATES DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE

NATIONAL REGISTER OF HISTORIC PLACES INVENTORY – NOMINATION FORM

(Type all entries – complete applicable sections)

STATE: Florida
COUNTY: Brevard
FOR NPS USE ONLY
ENTRY NUMBER | DATE

1. NAME
COMMON: Launch Complex 39
AND/OR HISTORIC: America's First Spaceport

2. LOCATION
STREET AND NUMBER: John F. Kennedy Space Center, NASA
CITY OR TOWN: Kennedy Space Center
STATE: Florida, 32899 | CODE: 12 | COUNTY: Brevard | CODE: 09

3. CLASSIFICATION

CATEGORY (Check One)	OWNERSHIP		STATUS	ACCESSIBLE TO THE PUBLIC
☐ District ☐ Building ☒ Site ☐ Structure ☐ Object	☒ Public ☐ Private ☐ Both	Public Acquisition: ☐ In Process ☐ Being Considered	☒ Occupied ☐ Unoccupied ☐ Preservation work in progress	Yes: ☒ Restricted ☐ Unrestricted ☐ No

PRESENT USE (Check One or More as Appropriate)
☐ Agricultural ☒ Government ☐ Park ☐ Transportation ☐ Comments
☐ Commercial ☐ Industrial ☐ Private Residence ☐ Other (Specify)
☐ Educational ☐ Military ☐ Religious
☐ Entertainment ☐ Museum ☒ Scientific

4. OWNER OF PROPERTY
OWNER'S NAME: John F. Kennedy Space Center, NASA
STREET AND NUMBER:
CITY OR TOWN: Kennedy Space Center, | STATE: Florida, 32899 | CODE: 12

5. LOCATION OF LEGAL DESCRIPTION
COURTHOUSE, REGISTRY OF DEEDS, ETC: Clerk of Circuit Court, Recording Office
STREET AND NUMBER: Brevard County Court House
CITY OR TOWN: Titusville, | STATE: Florida, 32780 | CODE: 9-09

6. REPRESENTATION IN EXISTING SURVEYS
TITLE OF SURVEY: Launch Complex 39 Siting Survey
DATE OF SURVEY: 1962 ☒ Federal ☐ State ☐ County ☐ Local
DEPOSITORY FOR SURVEY RECORDS: John F. Kennedy Space Center, NASA
STREET AND NUMBER:
CITY OR TOWN: Kennedy Space Center, | STATE: Florida, 32899 | CODE:

STATE | COUNTY | ENTRY NUMBER | DATE

SEE INSTRUCTIONS

SEE SITE FILE STAFF FOR ORIGINAL PHOTO(S) OR MAP(S)

RELEASED - Printed documents may be obsolete; validate prior to use.

7. DESCRIPTION

CONDITION

☐ Excellent ☒ Good ☐ Fair (Check One) ☐ Deteriorated ☐ Ruins ☐ Unexposed (Check One)

☐ Altered ☒ Unaltered (Check One) ☐ Moved ☒ Original Site (Check One)

DESCRIBE THE PRESENT AND ORIGINAL (if known) PHYSICAL APPEARANCE

Launch Complex 39 is a part of the John F. Kennedy Space Center, NASA, a United States Government installation in Brevard County, Florida. Located partly on the northern end of Merritt Island and partly on the narrow coastal strip to the eastward, the low-lying land on which the Complex is sited is mainly marsh land. About 11.5 million cubic meters (over 15 million cubic yards) of fill were dredged from nearby land and water areas to provide a base on which the Complex was built between November, 1962 and October, 1968. Principal structures on the Complex include:

The Vehicle Assembly Building, one of the world's largest buildings in volume;

The Launch Control Center, housing the electronic equipment used to control and direct tests and launch operations;

Three Mobile Launchers, on which the space vehicles are erected and tested within the Vehicle Assembly Building, then moved to the pads for launching;

A Mobile Service Structure, providing access for servicing the space vehicles while on the launch pads;

Two Transporters (or Crawlers), used to lift and move the Mobile Launchers (including the space vehicles) and the Mobile Service Structure;

The Crawlerway, a wide, heavy-duty roadbed on which the Transporters move;

Launch Areas A and B, each including an elevated launch pad, storage tanks for propellants, and the necessary hydraulic, pneumatic, mechanical, and electronic servicing and control equipment.

At the present time, Launch Complex 39 is in much the same configuration as when it was completed, and in which it was used to launch the Apollo manned lunar landing missions. Since it is an operational spaceport, the requirements of future space programs may cause changes to be made in existing structures, or new facilities to be added.

There are no fences or other physical boundaries separating Launch Complex 39 from the rest of the Kennedy Space Center. However, the coordinates given in Item 10 describe a rectangle within which lies the entire Complex.

Guided bus tours, leaving from a Visitor's Information Center on the John F. Kennedy Space Center, permit the general public to view the structures on Launch Complex 39.

SEE INSTRUCTIONS

2

RELEASED - Printed documents may be obsolete; validate prior to use.

SIGNIFICANCE

PERIOD (Check One or More as Appropriate)

- ☐ Pre-Columbian
- ☐ 15th Century
- ☐ 16th Century
- ☐ 17th Century
- ☐ 18th Century
- ☐ 19th Century
- ☒ 20th Century

SPECIFIC DATE(S) (If Applicable and Known) Completed October 1968

AREAS OF SIGNIFICANCE (Check One or More as Appropriate)

- ☐ Aboriginal
- ☐ Prehistoric
- ☐ Historic
- ☐ Agriculture
- ☒ Architecture
- ☐ Art
- ☐ Commerce
- ☒ Communications
- ☐ Conservation
- ☐ Education
- ☒ Engineering
- ☒ Industry
- ☐ Invention
- ☐ Landscape Architecture
- ☐ Literature
- ☐ Military
- ☐ Music
- ☐ Political
- ☐ Religion/Philosophy
- ☒ Science
- ☐ Sculpture
- ☐ Social/Humanitarian
- ☐ Theater
- ☒ Transportation
- ☐ Urban Planning
- ☒ Other (Specify) Space Exploration

STATEMENT OF SIGNIFICANCE

Launch Complex 39 is the location where man's first voyage from Earth to another celestial body began at 9:32:0634 a.m., Eastern Daylight Time, July 16, 1969.

The Apollo 11 lunar landing mission of Astronauts Neil A. Armstrong, Edwin E. Aldrin, Jr., and Michael Collins was launched from Mobile Launcher 1 atop the elevated pad at Launch Area A. The assembly of the Apollo-Saturn space vehicle for the Apollo 11 mission on Mobile Launcher 1 in High Bay 1 of the Vehicle Assembly Building began on February 1, 1969, and was completed on April 14. A Transporter lifted the Mobile Launcher and space vehicle and moved it along the Crawlerway to the elevated pad at Launch Area A on May 20. Terminal Countdown began at 8:00 p.m. EDT, July 10. All prelaunch checkout tests, countdown, and launch were directed and controlled from Firing Room 1 of the Launch Control Center.

First Launch from Launch Complex 39 was the unmanned Earth-orbital Apollo 4 mission, launched November 9, 1967. Other historic space flights in the Apollo manned lunar landing program from Launch Complex 39 were:

Two manned circumnavigations of the Moon; Apollo 8, launched December 21, 1968, and Apollo 10, launched May 18, 1969.

One manned Earth-orbital flight, Apollo 9, launched March 3, 1969.

Five successful manned lunar landing missions; Apollo 11; Apollo 12, launched November 14, 1969; Apollo 14, January 31, 1971; Apollo 15, July 26, 1971; Apollo 16, April 16, 1972.

One manned lunar landing mission, Apollo 13, successfully launched April 11, 1970, but forced to abort the mission due to spacecraft problems. The crew returned safely to Earth.

The final mission in the Apollo manned lunar landing program, Apollo 17, is scheduled to be launched from Launch Complex 39 on December 6, 1972.

In 1966, Launch Complex 39 was named as the Outstanding Civil Engineering Achievement by the American Society of Civil Engineers. A plaque presented by the Society is mounted in the lobby of the Launch Control Center.

SEE INSTRUCTIONS

3

RELEASED - Printed documents may be obsolete; validate prior to use.

9. MAJOR BIBLIOGRAPHICAL REFERENCES

;ood, Clarence. "Saturn V Checkout Facilities at Merritt Island Launch ..rea." American Institute of Aeronautics and Astronautics. Space Flight Testing Conference, Cocoa Beach, Florida, March 18-20, 1963, New York, 1963.

Debus, Kurt H. "Launch Operations Support in the Saturn V/Apollo Program." American Astronautical Society. Tenth Annual Meeting, New York, N.Y., May 4-7, 1964. Preprint.

Petrone, Rocco A. "Saturn V/Apollo Launch Operations Plan." American Institute of Aeronautics and Astronautics. Space Flight Testing Conference, Cocoa Beach, Florida, March 18-20, 1963. New York, 1963.

10. GEOGRAPHICAL DATA

LATITUDE AND LONGITUDE COORDINATES DEFINING A RECTANGLE LOCATING THE PROPERTY

CORNER	LATITUDE Degrees	Minutes	Seconds	LONGITUDE Degrees	Minutes	Seconds
NW	28°	36'	48"	80°	40'	16"
NE	28°	38'	12"	80°	37'	14"
SE	28°	36'	11"	80°	35'	28"
SW	28°	34'	08"	80°	38'	40"

OR

LATITUDE AND LONGITUDE COORDINATES DEFINING THE CENTER POINT OF A PROPERTY OF LESS THAN TEN ACRES

LATITUDE Degrees	Minutes	Seconds	LONGITUDE Degrees	Minutes	Seconds

APPROXIMATE ACREAGE OF NOMINATED PROPERTY: Approximately 7,000

LIST ALL STATES AND COUNTIES FOR PROPERTIES OVERLAPPING STATE OR COUNTY BOUNDARIES

STATE:	CODE	COUNTY	CODE
STATE:	CODE	COUNTY:	CODE
STATE:	CODE	COUNTY:	CODE
STATE:	CODE	COUNTY:	CODE

11. FORM PREPARED BY

NAME AND TITLE: Joseph Hawkins / Chief, Documentation & Data Management Branch

ORGANIZATION: Kennedy Space Center, NASA — DATE: 8/10/77

STREET AND NUMBER:

CITY OR TOWN: — STATE: — CODE: 12

SEE INSTRUCTIONS

12. STATE LIAISON OFFICER CERTIFICATION

As the designated State Liaison Officer for the National Historic Preservation Act of 1966 (Public Law 89-665), I hereby nominate this property for inclusion in the National Register and certify that it has been evaluated according to the criteria and procedures set forth by the National Park Service. The recommended level of significance of this nomination is:

National ☐ State ☐ Local ☐

Name _____

Title _____

Date _____

NATIONAL REGISTER VERIFICATION

I hereby certify that this property is included in the National Register.

Chief, Office of Archaeology and Historic Preservation

Date _____

ATTEST:

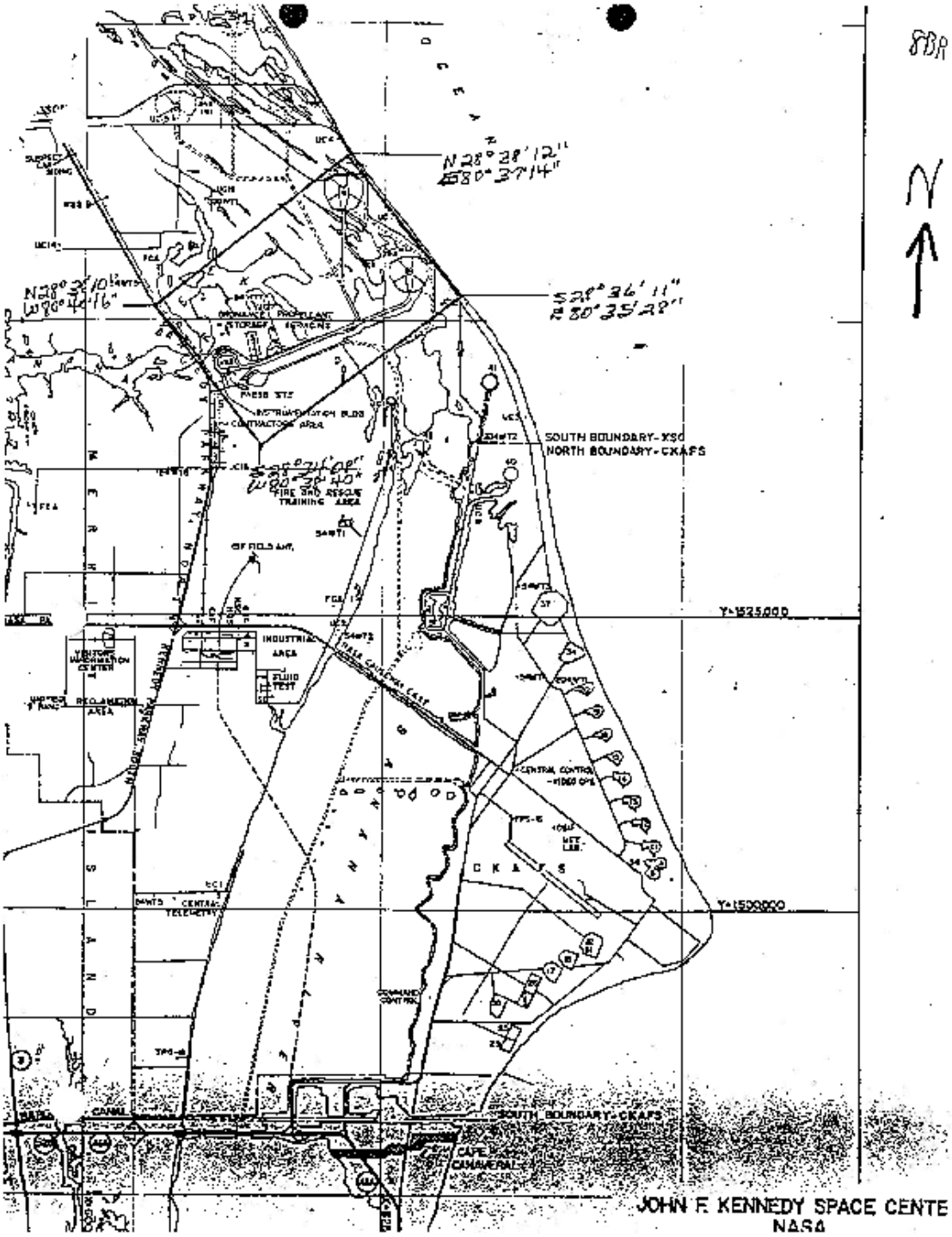
Keeper of The National Register

Date _____

4

GPO 901-037

RELEASED - Printed documents may be obsolete; validate prior to use.



RELEASED - Printed documents may be obsolete; validate prior to use.

APPENDIX D: Recorded Archaeological Sites Located at KSC

RELEASED - Printed documents may be obsolete; validate prior to use.

RECORDED ARCHAEOLOGICAL SITES LOCATED AT KSC

Site No.	Site Name	Quad Map T/R/S	Site Type[1]	Period(s)[2]	Eval[3]	Recom[4]	Comments
8BR60	No Name	ORSINO 22S/36E/13	UNK	UNK	D	3	Site location unverified. Listed in FMSF as "noncultural."
8BR61	No Name	FALSE CAPE 22S/37E/27	UNK	UNK	D	3	Site location unverified. Listed in FMSF as "noncultural." SHPO letter 12/10/1991
8BR62	Moore Mound	ORSINO 22S/36E/28	BM, MID	SJ	D	3	Exact location unknown
8BR76	New Haulover Canal Artifact Scatter	WILSON 20S/36E/19	AS	SJ	E	4	
8BR77	Nauman's Place	WILSON 20S/36E/29	BM, SM	SJII	B	1	
8BR78 (A-D)	Dummett's Place	WILSON 20S/36E/32,33	SM,HR,HIS	ARC, SJI, SJII, 19th and 20th century	B	1	SHPO letter 01/12/1993
8BR79	Titusville Beach	FALSE CAPE 22S/37E/3	SM, HR	ARC, OR,SJI, SJII, 1st SPAN, 19th and 20th century	E	4	Destroyed SHPO letter 12/10/1991
8BR84	No Name	WILSON 21S/37E/28	HR	1st SPAN	D	3	Exact location unknown
8BR139	Dummit Grove NE	WILSON 20S/36E/33	SM	SJ	B	1	SHPO letter 03/07/2011
8BR141	Onion Island	OAK HILL 20S/35E/4	UNK	OR, SJ	C	2	Aboriginal pottery and animal bone SHPO letter 01/12/1993
8BR142	Butler Campbell's Mound CANA-58	OAK HILL 20S/35E/13	BM	PREH	D	1, 3	Not found at recorded location SHPO letters 03/07/2011, 01/12/1993

RELEASED - Printed documents may be obsolete; validate prior to use.

RECORDED ARCHAEOLOGICAL SITES LOCATED AT KSC (cont.).

Site No.	Site Name	Quad Map T/R/S	Site Type[1]	Period(s)[2]	Eval[3]	Recom[4]	Comments
8BR143	Ragin Midden CANA-47	WILSON 20S/36E/29	SM, HR	SJ	B	1	SHPO letter 03/07/2011
8BR144	No Name CANA-48	WILSON 21S/36E/10	SM	SJ	D	1, 3	SHPO letter 03/07/2011
8BR145	Clark Slough CANA-49	WILSON 21S/36E/11	SM	SJ	B	1	SHPO letter 03/07/2011
8BR146	Bull Camp Midden CANA-52	WILSON 21S/36E/13	SM	SJ	E	4	SHPO letter 03/07/2011
8BR147	No Name /CANA-53	WILSON 21S/36E/18	SM	SJ	D	3	SHPO letter 01/12/1993
8BR148	No Name/CANA-55	WILSON 21S/36E/18	SM	SJ	D	3	SHPO letter 01/12/1993
8BR149	No Name/CANA-56	WILSON 21S/36E/18	SM	SJ	D	3	
8BR150	Oyster Prong Creek	ORSINO 22S/36E/27	BM	PREH	D	3	Exact location unknown
8BR151	Max Hoeck Burial Mound/CANA-54	WILSON 21S/37E/19	BM, AS	SJ	B	1, 3	SHPO letters 03/07/2011 and 01/12/1993
8BR152	No Official Name CANA-40	PARDON T/9S/36F/5	SM	SJ	D	4	
8BR153	Beach Road Hammock/CANA-42	PARDON T20S/36F/9	SM	SJ	D	4	
8BR154	Eddy Creek CANA-51	WILSON 21S/37E/7	SM, AS,HR	SJ	D	4	
8BR155	Granny Cove	WILSON 20S/36E/29	SM	SJ, 19th century	B	1	SHPO letter 01/12/1993
8BR156	No Name	WILSON 21S/36E/20	BM	PREH	D	3	Exact location unknown
8BR157	KARS Park	COURTENAY 23S/37E/31	AS	SJ	E	4	SHPO letter 02/06/1992
8BR159	No Name	MIMS 21S/35E/35	UNK	UNK	D	3	
8BR160	Black Point Midden	MIMS 21S/35E/12	SM	SJ	D	3	Exact location unknown

RELEASED - Printed documents may be obsolete; validate prior to use.

RECORDED ARCHAEOLOGICAL SITES LOCATED AT KSC (cont.).

Site No.	Site Name	Quad Map T/R/S	Site Type[1]	Period(s)[2]	Eval[3]	Recom[4]	Comments
8BR161	No Name	ORSINO 22S/36E/21	UNK	SJ	D	3	Exact location unknown
8BR167	Paynes Midden CANA-50	WILSON T21S/36E/1	SM	SJ	E	4	
8BR169	South Access Road	ORSINO 22S/36E/1	AS	OR, SJI, SJII	E	4	SHPO letter 02/06/1992
8BR170	Opposite Futch Cove	ORSINO 22S/37E/1	MID, HR	ARC, OR, SJI, SJII, 19th cent	B	1	Phase II and III excavations have been conducted.
8BR171	Stony Island	ORSINO 22S/36E/9	SA	OR	E	4	
8BR175	Fort Ann	WILSON 20S/36E/30	HIS	19th to 20th century	B	1	SHPO letter 01/12/1993
8BR183	Pardon Island CANA-43	PARDON T20S/35E/9	SM	UNK	D	3	SHPO letter 02/06/1992
8BR184	Widgeon Bay CANA-44	PARDON T20S/36E/15	SM,SA	SJ	D	3	
8BR185	Ephemeral Midden (Also No Official Name and West Mangrove Midden)	PARDON T20S/36E/15	MID	UNK	D	3	
8BR188	Old Haulover Canal CANA-46	WILSON 20S/36E/29	HIS	19th century	A	1	NRHP listed in 1978 SHPO letters 01/12/1993 and 03/07/2011
8BR191	No Name	OAK HILL 20S/36E/18	CEM	UNK	D	1, 3	Not at recorded location SHPO letter 03/07/2011
8BR205	Max Hoeck Midden CANA-57	WILSON 21S/37E/19	SM, HR	OR, SJI, SJII	B	1	SHPO letter 01/12/1993
8BR206	Pepper Hammock	FALSE CAPE 22S/37E/9	AS, HR	PREH, SJII, 20th century	B	1	

RELEASED - Printed documents may be obsolete; validate prior to use.

RECORDED ARCHAEOLOGICAL SITES LOCATED AT KSC (cont.).

Site No.	Site Name	Quad Map T/R/S	Site Type[1]	Period(s)[2]	Eval[3]	Recom[4]	Comments
8BR217	20th c. Historic Deposit	ORSINO 23S/37E/5	HR	19th and 20th century	E	4	Destroyed by construction of Payload Hazardous Facility
8BR540	Daigle Place	ORSINO 21S/36E/34	HR	19th and 20th century	E	4	Destroyed by shuttle runway construction
8BR541	Hughes Place	ORSINO 22S/36E/2	HR	20th century	E	4	SHPO letter 02/06/1992
8BR542	Parsons Place	WILSON 21S/36E/27	HR	19th and 20th century	E	4	SHPO letter 02/06/1992
8BR543	Griffith Place	ORSINO 22S/36E/1	HR	20th century	E	4	SHPO letter 02/06/1992
8BR544	Lopez Orchard	ORSINO 22S/36E/2	HR	20th century	E	4	
8BR555	Eddy Creek Boat Launch Area CANA-75	WILSON 21S/37E 7	SM	SJ	D	4	
8BR556	Playalinda Beach Parking Area No. 8 CANA-76	WILSON 21S/37E/7	HR	SJ	D	4	
8BR582	Dune and Swale	ORSINO 22S/37E/20	LS	PREH	E	4	SHPO letter08/29/1990
8BR773	VIP West	ORSINO 22S/36E/1	AS	PREH	E	4	
8BR774	Astronaut Road	ORSINO 22S/36E/1	AS	OR, TRAN	B	1	SHPO letter 12/10/1991
8BR909	East Max Hoeck Creek Midden CANA-78	WILSON 21S/37E/17	SM	ARC, OR, SJI	C	3	
8BR910	Scorching Machete	ORSINO 21S/37E/32	AS	SJI	E	4	
8BR911	Happy Creek One	ORSINO 21S/37E/31	AS	UNK	E	4	
8BR912	Rotten Dock	ORSINO 21S/37E/31	AS	SJ	E	4	
8BR913	Landfill South	ORSINO 22S/37E/29	AS	SJ	B	2	SHPO letter 02/10/1991

RELEASED - Printed documents may be obsolete; validate prior to use.

RECORDED ARCHAEOLOGICAL SITES LOCATED AT KSC (cont.).

Site No.	Site Name	Quad Map T/R/S	Site Type[1]	Period(s)[2]	Eval[3]	Recom[4]	Comments
8BR914	LC 41 South	WILSON 22S/37E/13	MID	SJII	B	2	
8BR915	Titusville Beach West #1	WILSON 22S/37E/11	AS	SJ	E	4	No evidence of site found during 2008 survey of the CVLC (ACI 2008)
8BR916	Titusville Beach West #2	WILSON 22S/37E/11	MID	UNK	E	4	No evidence of site found during 2008 survey of the CVLC (ACI 2008)
8BR917	Gator Hole	WILSON 21S/37E/34	AS	SJ	E	4	
8BR1606	KARS Park North	COURTENAY 23S/37E/32	AS	SJI, 20th century	E	4	SHPO letter 02/06/1992
8BR1617	Dummit Place South	WILSON 20S/36E/33	AS	TRAN, SJI	E	4	SHPO letter 01/12/1993
8BR1618	Minute Flake	WILSON 20S/36E/32	SA	UNK	E	4	SHPO letter 01/12/1993
8BR1619	Dummit Creek North Midden	WILSON 20S/36E/32	MID	OR, SJI	C	2	SHPO letter 01/12/1993
8BR1620	SE of Nauman's Place	WILSON 20S/36E/29	AS	SJ	C	2	SHPO letter 01/12/1993
8BR1621	Granny Cove North	WILSON 20S/36E/29	AS	SJII	E	4	SHPO letter 01/12/1993
8BR1622	Allenhurst Midden	MIMS 20S/36E/19	MID	SJI	B	1	SHPO letter 01/12/1993
8BR1623	Duckroost Grove	MIMS 20S/35E/13	AS	SJI	E	4	SHPO letter 01/12/1993
8BR1624/ 8BR186	Emma Watton Cemetery	MIMS 20S/35E/13	CEM	UNK	E	1	SHPO letter 01/12/1993
8BR1625	Dike Access Road	OAK HILL 20S/35E/13	AS	SJI, 19th and 20th century	E	4	SHPO letter 01/12/1993
8BR1626	Crook/Watton Cemetery	OAK HILL 20S/35E/13	CEM	UNK	E	1	SHPO letter 01/12/1993
8BR1627	Pattillo Creek	OAK HILL 20S/35E/12	SA	UNK	E	4	SHPO letter 01/12/1993

RELEASED - Printed documents may be obsolete; validate prior to use.

RECORDED ARCHAEOLOGICAL SITES LOCATED AT KSC (cont.).

Site No.	Site Name	Quad Map T/R/S	Site Type[1]	Period(s)[2]	Eval[3]	Recom[4]	Comments
8BR1628	Lost in the Grass	OAK HILL 20S/35E/3	AS	SJI	E	4	SHPO letter 01/12/1993
8BR1629	Fallow Grove	OAK HILL 20S/35E/3	AS	SJI	E	4	SHPO letter 01/12/1993
8BR1630	Shiloh Sand Hills	OAK HILL 20S/35E/3	AS	SJI, SJII	B	1	SHPO letter 01/12/1993
8BR1631	Griffis Cemetery	OAK HILL 20S/35E/3	CEM	19th and 20th century	E	1	SHPO letter 01/12/1993
8BR1632	Edgar/Campbell Midden/CANA-102	OAK HILL 20S/35E/13	SM	SJII	B	1	SHPO letters 03/07/2011 and 01/12/1993
8BR1633	Apiary # 53 CANA-103	OAK HILL 20S/35E/13	AS, MID	SJII	B	1, 3	SHPO letters 03/07/2011 and 01/12/1993
8BR1659	Tea Hammock West	FALSE CAPE 22S/37E/22	SM	PREH	D	3	
8BR1663	Orbiter Storage	ORSINO 22S/36E/1	AS	PREH	E	4	
8BR1664	Archaic Surface Scatter CANA-104	WILSON 21S/36E/14	LS	ARC	E	4	SHPO letter 03/07/2011
8BR1665	Old Canal Midden CANA-105	WILSON 20S/36E/29	SM	SJ	D	1, 3	SHPO letter 03/07/2011
8BR1666	Marsh Crossing CANA-106	WILSON 21S/36E/4	AS	SJI	E	4	SHPO letter 03/07/2011
8BR1667	Thin Sand Ridge CANA-107	WILSON 20S/36E/33	SA	SJ	E	4	SHPO letter 03/07/2011
8BR1668	Ceramic Surface Cluster/CANA-108	WILSON 20S/36E/33	AS	SJI	E	4	SHPO letter 03/07/2011
8BR1669	Spoon Bill CANA-109	WILSON 20S/36E/33	AS	SJII	D	1, 3	SHPO letter 03/07/2011
8BR1670	Haulover Canal Midden/CANA-111	MIMS 20S/36E/19	SM, HR	SJ, 20th century	D	1, 3	SHPO letter 03/07/2011

RELEASED - Printed documents may be obsolete; validate prior to use.

RECORDED ARCHAEOLOGICAL SITES LOCATED AT KSC (cont.).

Site No.	Site Name	Quad Map T/R/S	Site Type[1]	Period(s)[2]	Eval[3]	Recom[4]	Comments
8BR1671	Haulover Artifact Scatter	MIMS 20S/36E/19	AS	SJ	D	1, 3	SHPO letter 03/07/2011
8BR1672	Haulover Pond Midden/CANA-112	MIMS 20S/36E/19	MID	SJI	D	1, 3	SHPO letter 03/07/2011
8BR1673	Haulover Sand Mound and Midden CANA-113	MIMS 20S/36E/19	BM, MID	SJI	B	1	Human remains SHPO letter 03/07/2011
8BR1674	76th Street NW Midden/CANA-114	MIMS 20S/36E/18	SM	SJ	B	1, 3	SHPO letter 03/07/2011
8BR1675	Little Shell Point CANA-115	OAK HILL 20S/36E/18	SM	SJ	C	1, 3	SHPO letter 03/07/2011
8BR1676	Mt. Zion/ Campbell/ Jackson Cemetery CANA-60	OAK HILL 20S/35E/13	CEM	20th century	E	1	SEAC considers this to be the same as 8BR186 SHPO letter 03/07/2011.
8BR1677	Campbell/Jackson Sheet Midden/ CANA-116	OAK HILL 20S/35E/13	MID	SJ	E	1, 3	SHPO letter 03/07/2011
8BR1678	Friable Sherds CANA-117	OAK HILL 20S/35E/13	AS	SJ	E	1, 3	SHPO letter 03/07/2011
8BR1679	Diffuse Ceramic Scatter/CANA-118	OAK HILL 20S/35E/13	AS	SJI	E	1, 3	SHPO letter 03/07/2011
8BR1680	Relic Grove CANA-119	OAK HILL 20S/35E/13	SM	SJ	C	1, 3	SHPO letter 03/07/2011
8BR1850	Bull Snake Ridge (also Jerome Road Ridge)	COURTENAY 23S/37E/18	SA	UNK	E	4	No site file form was ever received by the FMSF. Number was assigned on March 3, 2003.
8BR1942	Lone Sherd CANA-80	PARDON ISLAND T20S/R36E/9	AS,SA	SJ	E	4	

RELEASED - Printed documents may be obsolete; validate prior to use.

RECORDED ARCHAEOLOGICAL SITES LOCATED AT KSC (cont.).

Site No.	Site Name	Quad Map T/R/S	Site Type[1]	Period(s)[2]	Eval[3]	Recom[4]	Comments
8BR1943	Dog's Cross CANA-81	PARDON ISLAND T20S/R36E/9	SM, AS	SJ	E	4	
8BR1944	Dead Mangrove Island/CANA-82	PARDON ISLAND T20S/R36E/9	SM, HR	SJ	E	4	
8BR1945	Scorpion Dike CANA-83	PARDON ISLAND T20S/R36E/16	SM	SJ	E	4	
8BR1946	No Official Name CANA-84	PARDON ISLAND T20S/R36E/16	SM	SJ	E	4	
8BR1947	Bay Head Midden CANA-85	PARDON ISLAND T20S/R36E 16	SM	SJ	E	4	
8BR1948	No Official Name CANA-86	PARDON ISLAND T20S/R36E 16	SM	SJ	D	3	
8BR1949	Long Shore Midden CANA-87	PARDON ISLAND T20S/R36E 16	SM	SJ	D	3	
8BR1950	No Official Name CANA-88	PARDON ISLAND T20S/R36E 16	SM	SJ	E	4	Destroyed
8BR1951	North Mangrove Midden CANA-89	PARDON ISLAND T20S/R36E 16	SM	SJ	E	4	Destroyed
8BR1952	No Official Name CANA-90	PARDON ISLAND T20S/R36E 16	SM	SJ	E	4	Destroyed
8BR1953	No Official Name CANA-91	PARDON ISLAND T20S/R36E 16	SM	SJ	D	3	
8BR1954	No Official Name CANA-92	PARDON ISLAND T20S/R36E 15	SM	SJ	E	4	Destroyed
8BR1955	No Official Name CANA-93	PARDON ISLAND T20S/R36E 15	SM	SJ	E	4	Destroyed
8BR1956	Cut Corner Midden CANA-94	PARDON ISLAND T20S/R36E 15	SM	SJ	D	3	

RELEASED - Printed documents may be obsolete; validate prior to use.

RECORDED ARCHAEOLOGICAL SITES LOCATED AT KSC (cont.).

Site No.	Site Name	Quad Map T/R/S	Site Type[1]	Period(s)[2]	Eval[3]	Recom[4]	Comments
8BR1958	No Official Name CANA-97	PARDON ISLAND T20S/R36E/15	SM	SJ	E	4	
8BR1959	Canoer's Corner CANA-98	PARDON ISLAND T20S/R36E/15	SM	SJ	E	4	
8BR2229	Clifton Schoolhouse Archaeological Site CANA-124	OAK HILL 20S/35E 13	AS, HIS	SJ, 19th and 20th century	C	3	
8BR2230	New Smyrna to Haulover Canal Road/Kings Road	OAK HILL 19S/35E	HIS	19th and 20th century	C	3	Also recorded as 8VO8880
8BR2258	New Haulover Canal CANA-127	MIMS 20S/36E 19	HIS	19th century	C	1	Elliot's Plantation, Reevaluated by Schwadron in 2008
8BR2364	Bottle Dump Site	FALSE CAPE 22S/37E/3	HR	19th and 20th century	D	4	2009 survey
8BR2412	Gallinipper Basin #1 CANA-170	WILSON 21S/37E 7	AS	SJ	D	4	
8BR2413	Buried Midden CANA-171	WILSON 20S/36E 22	SM	UNK	D	4	
8BR2414	Lantana Midden CANA-172	WILSON 20S /36E 21	SM	UNK	D	2	
8BR2415	Lantana North Midden/CANA-173	WILSON 20S / 36E 16	SM	UNK	D	2	
8BR2416	Gallinipper Basin #2 CANA-175	WILSON 21S / 37E 7	SM	SJ	D	4	
8BR2675	Cactus Island Midden/CANA-192	PARDON ISLAND 20S / 36E 8	SM	UNK	C	3	
8BR2676	Harrier Midden CANA-193	PARDON ISLAND 20S / 36E 8	SM	UNK	D	4	

RELEASED - Printed documents may be obsolete; validate prior to use.

RECORDED ARCHAEOLOGICAL SITES LOCATED AT KSC (cont.).

Site No.	Site Name	Quad Map T/R/S	Site Type[1]	Period(s)[2]	Eval[3]	Recom[4]	Comments
8BR2677	Kestrel Midden CANA-194	PARDON ISLAND 20S / 36E 8	SM	UNK	D	4	
8BR2678	Plover Midden CANA-195	PARDON ISLAND 20S / 36E 8	SM	UNK	C	3	
8BR2679	Turnstone Midden CANA-196	PARDON ISLAND 20S / 36E 16	SM	UNK	D	4	
8BR2680	Klondike Beach Ruins/CANA-197	WILSON 20S / 36E 26	HIS		D	4	
8VO129	Bill's Hill; Scobey Place/CANA-62	OAK HILL 19S/35E/35	SM, BM	SJ	B	1, 3	SHPO letters 01/12/1993 and 03/07/2011
8VO130	Ross Hammock Midden CANA-35	OAK HILL 19S/35E	SM	SJI, SJII, 1st SPAN, BRIT, 19th and 20th century	A	1	Included in 8VO2569, Ross Hammock Archaeological District; Reevaluated by Schwadron in 2008 SHPO letter 01/12/1993
8VO131	Ross Hammock Indian Mounds CANA-35	OAK HILL 19S/35E	BM (2)	SJI, SJII, SEM, BRIT, 19th and 20th century	A	1	Included in 8VO2569, Ross Hammock Archaeological District; Reevaluated by Schwadron in 2008 SHPO letter 01/12/1993
8VO143	McCarty Place CANA-31	OAK HILL 19S/35E/16	SM	PREH	E	1, 3	SHPO letter 03/07/2011
8VO148	Griffis Place; Indian Mound SE	OAK HILL 19S/35E	BM	PREH	B	1	SHPO letter 01/12/1993
8VO149	Kingfisher/CANA-24	OAK HILL 19S/35E/2	SM	SJ	C	3	
8VO150	Lagoon/CANA-30	OAK HILL 19S/35E/12	SM	UNK	D	3	SHPO letter 01/12/1993

RELEASED - Printed documents may be obsolete; validate prior to use.

RECORDED ARCHAEOLOGICAL SITES LOCATED AT KSC (cont.).

Site No.	Site Name	Quad Map T/R/S	Site Type[1]	Period(s)[2]	Eval[3]	Recom[4]	Comments
8VO150b	Apollo Midden CANA-77	OAK HILL 19S / 35E 12	SM, AS	PREH	D	3	
8VO151	Cat Hammock CANA-36	OAKHILL 19S/35-36E 30	SM, AS	SJ	C	3	SHPO letter 01/12/1993
8VO153	Hog Island CANA-22	OAK HILL 19S/35E/2	SM, AS	SJ	D	3	
8VO154	Georges Island CANA-29	OAK HILL 19S/35E/10	SM	SJ	D	3	
8VO155	Garvers Island CANA-23	OAK HILL 19S/35E/1	SM	SJ	D	3	
8VO156	No Official Name CANA-32	OAK HILL/T19S/35E/12	SM	SJ	D	3	
8VO157	Shelton Kurt Island CANA-33	OAK HILL T19S/35E/13	SM	SJ	D	4	
8VO158	No Official Name CANA-38	OAK HILL T19S/35E/29	SM	UNK	D	3	
8VO159	Vanns Island CANA-37	OAK HILL 19S/353/30	SM	SJ	D	3	
8VO160	Sugar Mill Ruins	OAK HILL 19S/35E	HIS	2nd SPAN, BRIT, 19th and 20th century	B	1	Elliot's Plantation, Reevaluated by Schwadron in 2008
8VO206	Middle Island CANA-28	OAK HILL T19S/35E/12	SM	UNK	D	3	
8VO207	Middle Island North/ CANA-26	OAK HILL T19S/35E/12	SM	SJ	D	3	Ref. 8VO5312

RELEASED - Printed documents may be obsolete; validate prior to use.

RECORDED ARCHAEOLOGICAL SITES LOCATED AT KSC (cont.).

Site No.	Site Name	Quad Map T/R/S	Site Type[1]	Period(s)[2]	Eval[3]	Recom[4]	Comments
8VO213/ 8VO2569	Ross Hammock Salt Rendering Plant CANA-34	OAK HILL 19S/35E/22	HIS	18th Century	A	1	Included in 8VO2569, Ross Hammock Archaeological District; Reevaluated by Schwadron in 2008 NRHP listed in 1981 SHPO letters 01/12/1993 and 03/07/2011
8VO2599	Coast Guard Life Saving Station CANA-64	OAK HILL 19S/35E/12	HIS, MID, HR, AS	19th and 20th Century	C	1	
8VO3129	Pistol Point CANA-74	OAK HILL 19S/35E/2	SM, HR, HIS	BRIT, 2ND SPAN	D	3	
8VO4371	Shiloh Grove	OAK HILL 19S/35E/34	SA	SJ	E	4	SHPO letter 01/12/1993
8VO4372	One Sherd	OAK HILL 19S/35E/33	SA	SJI	E	4	SHPO letter 01/12/1993
8VO4373	Little Creek	OAK HILL 19S/35E/29	AS	SJI	E	4	SHPO letter 01/12/1993
8VO4374	Micro Flake	OAK HILL 19S/35E/29	SA	UNK	E	4	SHPO letter 01/12/1993
8VO6785	Spike Point CANA-120	OAK HILL 19S/35E/34	SA	PREH	E	1, 3	SHPO letter 03/07/2011
8VO6786	Kuhl Midden CANA-121	OAK HILL 19S/35E/35	SM, HR	SJ, 19th and 20th century	B	1	SHPO letter 03/07/2011
8VO8883	Silver Palm CANA-99	ARIEL 19S/35E/2	HIS, AS, SM	SJ, 1st SPAN	C	3	
8VO8884	Hummingbird Mound/CANA-100	OAK HILL 19S/35E/1	AS, BM (HUMAN REMAINS)	SJ	B	3	

RELEASED - Printed documents may be obsolete; validate prior to use.

RECORDED ARCHAEOLOGICAL SITES LOCATED AT KSC (cont.).

Site No.	Site Name	Quad Map T/R/S	Site Type[1]	Period(s)[2]	Eval[3]	Recom[4]	Comments
8VO8885	Target Rock CANA-123	OAK HILL 19S/35E/13	HIS	20th century	D	3	
8VO8887	V-1 Impoundment CANA-126	OAK HILL 19S/35E/13	SM	SJ	D	3	
8VO8925	Saw Palmetto Midden CANA-132	OAK HILL 19S/35E/1	SM	SJ	D	3	
8VO8929	East Channel South #1 Midden CANA-137	OAK HILL 19S/35E/2	SM	UNK	D	3	
8VO8930	East Channel South #2 Midden/CANA-138	OAK HILL 19S/35E/2	SM	UNK	D	3	
8VO8931	Middle Island South CANA-139	OAK HILL 19S/35E/11	SM	UNK	D	3	
8VO8932	Small Relief Midden CANA-140	OAK HILL 19S/35E/11	SM	UNK	D	3	
8VO8933	Big Relief Midden CANA-141	OAK HILL 19S/35E/10	SM	UNK	D	3	
8VO8934	Hog Island East Midden/ CANA-142	OAK HILL 19S/35E/3	SM	SJ	C	3	
8VO8935	Hog Island Southeast Midden CANA-143	OAK HILL 19S/35E/3	SM	SJ	C	3	
8VO8943	Brutus Midden CANA-151	ARIEL 19S/35E/2	SM	SJ	C	1	
8VO8944	Ceasar Midden CANA-152	ARIEL 19S/35E/2	SM	SJ	C	1	

RELEASED - Printed documents may be obsolete; validate prior to use.

RECORDED ARCHAEOLOGICAL SITES LOCATED AT KSC (cont.).

Site No.	Site Name	Quad Map T/R/S	Site Type[1]	Period(s)[2]	Eval[3]	Recom[4]	Comments
8VO8945	Spanish Midden CANA-153	OAK HILL 19S/35E/11	SM	UNK PREH, UNK SPAN	D	3	
8VO8948	Fish Hook Midden CANA-156	OAK HILL 19S/35E/10	SM	UNK	D	3	
8VO8949	Georges North Midden/CANA-157	OAK HILL 19S/35E/10	SM	UNK	D	3	
8VO8950	Shotgun Flats Midden/ CANA-158	OAK HILL 19S/35E/10	SM	UNK	D	3	
8VO8951	Hog Island Northwest Midden/CANA-159	OAK HILL 19S/35E/3	SM	SJ	C	3	
8VO8952	West of Plantation Midden/ CANA-160	OAK HILL 19S/35E/3	SM	UNK	D	3	
8VO8977	Tiger Shoal's Midden/ CANA-176	OAK HILL 19S/35E/25	SM	UNK	D	3	
8VO8978	Northwest of Vann's/ CANA-177	OAK HILL 19S/35E/25	SM	UNK	D	3	
8VO9280	Wood Duck Midden/ CANA-186	OAK HILL 19S/35E/13	SM	UNK	D	3	
8VO9281	Teal Midden/ CANA-187	OAK HILL 19S/35E/24	SM	SJ	C	3	
8VO9282	Mallard Midden/ CANA-188	OAK HILL 19S/36E/30	SM	UNK	D	3	
8VO9283	Preacher's Island/ CANA-189	OAK HILL 19S/36E/31	SM	UNK	C	3	
8VO9284	Merganser Midden/ CANA-190	OAK HILL 19S/36E/32	SM	UNK	D	4	
8VO9285	Caracara Midden/ CANA-191	OAK HILL 19S/36E/32	SM	PREH	D	3	

RELEASED - Printed documents may be obsolete; validate prior to use.

Legend for Recorded Archaeological Sites Located at KSC:
1 = Site Types: Burial Mounds (BM); Middens (MID); Shell Middens (SM); Historic Refuse (HR); Historic (HIS); Unknown (UNK); Artifact Scatters (AS); Single Artifacts (SA); Historic Cemetery (CEM); Lithic Scatters (LS)
2= Period: Archaic (ARC); British (BRIT); Orange (OR); Prehistoric (PREH); Seminole (SEM); St. Johns (SJ); St. Johns I (SJI); St. Johns II (SJII); 1st Spanish (1st SPAN); 2nd Spanish (2nd SPAN); Transitional (TRAN); Unknown (UNK)
3 = Evaluation Category: (A) National Register Listed; (B) National Register Eligible or Potentially Eligible; (C) Potentially Significant; (D) Not Determined; (E) Not Significant/Not Eligible. Classification of sites into one of these five evaluation categories was accomplished during archaeological survey(s) as described in Section 4.3.2.
4 = Recommendation Category: (1) Preservation and protection; (2) Limited test excavation; (3) Additional archaeological survey; (4) No further action

Listed Eligible

RELEASED - Printed documents may be obsolete; validate prior to use.

APPENDIX E: NRHP Listed and Eligible Historic Properties

RELEASED - Printed documents may be obsolete; validate prior to use.

NRHP LISTED AND ELIGIBLE HISTORIC FACILITIES

Facility No.	Facility	Built	FMSF No.	NRHP Resource Type	NRHP Status – Listed, Eligible, Individual (I), Contributing (C)	Significant Historic Context(s)	Criterion/ Criteria Consideration [1]
M6-0399	Headquarters Building	1965	8BR1691	Building	Listed (I)	Apollo	A, C, and G
M6-0342	Central Instrumentation Facility	1965	8BR1692	Building	Listed (I)	Apollo	A, C, and G
M7-0355	Neil Armstrong Operations and Checkout (O&C) Building	1964	8BR1693	Building	Listed (I)	Apollo	A, C, and G
K6-0848	Vehicle Assembly Building (VAB)	1962-66	8BR1684	Building	Listed (I)	Apollo	A, C, and G
					Eligible (I)	SSP	
K6-0947	VAB Utility Annex	1966	8BR3150	Building	Listed (C to VAB)	Apollo	A, C, and G
K6-0900	Launch Control Center	1966	8BR1685	Building	Listed (I)	Apollo	A, C, and G
					Eligible (I)	SSP	
	Crawler Transporters (2)	1965	8BR1688	Structure	Listed (I)	Apollo	A, C, and G
					Eligible (I)	SSP	
UK-0008	Crawlerway	1963-65	8BR1689	Structure	Listed (I)	Apollo	A, C, and G
					Eligible (I)	SSP	
	Press Site: Clock and Flag Pole	1969	8BR1690	Object	Listed (I)	Apollo	A and G
					Eligible (I)	SSP	
K6-0494	Rotation/Processing Building	1984	8BR1997	Building	Eligible (I)	SSP	A, C, and G
K7-1005	Barge Terminal Facility	1965	8BR2986	Structure	Eligible (C)	Apollo	A
					Eligible (C)	SSP	
L6-0247	Manufacturing Building	1986	8BR1998	Building	Eligible (I)	SSP	A and G
M7-0657	Parachute Refurbishment Facility	1964	8BR2014	Building	Eligible (I)	SSP	A and G
M7-0777	Canister Rotation Facility (renamed Launch Abort System Facility)	1993	8BR2016	Building	Eligible (I)	SSP	A, C, and G
	Payload Canisters (2)[d]	1978	8BR2017	Structure	Eligible (I)	SSP	A, C, and G
	Retrieval Ship *Liberty Star*[t]	1980-81	8BR2019	Structure	Eligible (I)	SSP	A and G
	Retrieval Ship *Freedom Star*[t]	1980-81	8BR2020	Structure	Eligible (I)	SSP	A and G
	Mobile Launcher Platforms (3)	1963-68	8BR2021	Structure	Eligible (I)	SSP	A, C, and G

RELEASED - Printed documents may be obsolete; validate prior to use.

NRHP LISTED AND ELIGIBLE HISTORIC FACILITIES (cont.).

Facility No.	Facility	Built	FMSF No.	NRHP Resource Type	NRHP Status – Listed, Eligible, Individual (I), Contributing (C)	Significant Historic Context(s)	Criterion/ Criteria Consideration [1]
M7-0360	Space Station Processing Facility	1992	8BR2671	Building	Eligible (I)	ISS	A, C, and G
M7-0361A	Ammonia Vapor Containment Building	2006	None	Building	Eligible (C to SSPF)	ISS	A and G
49635	Bioastronautics Operations Support Unit (BOSU)[d]	1965	8BR2905	Building	Eligible (I)	Apollo	A and G
M7-1150	Banana River Bridge	1964	8BR2955	Structure	Eligible (I)	Apollo/SSP/ISS	A and C
M3-0003	Indian River Bridge	1964	8BR2956	Structure	Eligible (I)	Apollo/SSP/ISS	A and C
E4-2414	Haulover Canal Bridge	1965	8BR2967	Structure	Eligible (I)	Apollo/SSP/ISS	A and C
M7-0409	Engineering Development Lab	1966	8BR2969	Building	Eligible (I)	Apollo	A and B
K8-1600	Beach House	1962	8BR2990	Building	Eligible (I)	Apollo/SSP	A and B
OV-104	Orbiter Atlantis[2]	1984	None	Structure	Eligible (I)	SSP	A, C, and G
	LC 39: Pad A Historic District[l]	1967-85	8BR1686	District	Listed	Apollo/SSP	A, C, and G
J8-1708	LC 39 Pad A	1963-65	8BR1995	Structure	Listed (I)	Apollo	A, C, and G
					Eligible (I) and (C) to 39A H.D.	SSP	
J8-1564	Foam Building	1965	None	Building	Listed (C)	Apollo	A, C, and G
J8-1565	Pump House	1964	None	Structure	Listed (C)	Apollo	A, C, and G
J8-1659	Compressed Air Building	1965	None	Building	Listed (C)	Apollo	A, C, and G
J8-1753	Remote Air Intake Building	1965	None	Building	Listed (C)	Apollo	A, C, and G
J8-1858	Azimuth Alignment Station	1965	None	Structure	Listed (C)	Apollo	A, C, and G
J8-1462	High Pressure GH2 Facility	1968	8BR2094	Structure	Listed (C)	Apollo	A, C, and G
					Eligible (C)	SSP	
J8-1502	LOX Facility	1966	8BR2095	Structure	Listed (C)	Apollo	A, C, and G
					Eligible (C)	SSP	

RELEASED - Printed documents may be obsolete; validate prior to use.

NRHP LISTED AND ELIGIBLE HISTORIC FACILITIES (cont.).

Facility No.	Facility	Built	FMSF No.	NRHP Resource Type	NRHP Status – Listed, Eligible, Individual (I), Contributing (C)	Significant Historic Context(s)	Criterion/ Criteria Consideration [1]
J8-1503	Operations Support Building A-1	1966	8BR2096	Building	Listed (C) Eligible (C)	Apollo SSP	A, C, and G
J8-1512	Camera Pad A No. 1	1966	8BR2097	Structure	Listed (C) Eligible (C)	Apollo SSP	A, C, and G
J8-1513	LH2 Facility	1966	8BR2098	Structure	Listed (C) Eligible (C)	Apollo SSP	A, C, and G
J8-1553	Electrical Equipment Building No. 2	1965	8BR2099	Building	Listed (C) Eligible (C)	Apollo SSP	A, C, and G
J8-1554	Camera Pad No. 6	1965	8BR2100	Structure	Listed (C) Eligible (C)	Apollo SSP	A, C, and G
J8-1563	Electrical Equipment Building No. 1	1965	8BR2101	Building	Listed (C) Eligible (C)	Apollo SSP	A, C, and G
J8-1614	Operations Support Building A-2	1966	8BR2102	Building	Listed (C) Eligible (C)	Apollo SSP	A, C, and G
J8-1703	Slidewire Termination Facility	1965	8BR2103	Structure	Listed (C) Eligible (C)	Apollo SSP	A, C, and G
J8-1707	Water Chiller Building	1968	8BR2104	Building	Listed (C) Eligible (C)	Apollo SSP	A, C, and G
J8-1714	Camera Pad A No.2	1965	8BR2105	Structure	Listed (C) Eligible (C)	Apollo SSP	A, C, and G
J8-1956	Camera Pad A No. 4	1965	8BR2106	Structure	Listed (C) Eligible (C)	Apollo SSP	A, C, and G
J8-1961	Camera Pad A No. 3	1965	8BR2107	Structure	Listed (C) Eligible (C)	Apollo SSP	A, C, and G

RELEASED - Printed documents may be obsolete; validate prior to use.

NRHP LISTED AND ELIGIBLE HISTORIC FACILITIES (cont.).

Facility No.	Facility	Built	FMSF No.	NRHP Resource Type	NRHP Status – Listed, Eligible, Individual (I), Contributing (C)	Significant Historic Context(s)	Criterion/ Criteria Consideration [1]
J8-1610	Water Tank	1980	8BR2108	Structure	Eligible (C)	SSP	A, C, and G
J8-1611	Flare Stack	1985	8BR2109	Structure	Eligible (C)	SSP	A, C, and G
J8-1811	Electrical Equipment Building No. 3	1979	8BR2110	Building	Eligible (C)	SSP	A, C, and G
J8-1856	Electrical Equipment Building No. 4	1979	8BR2111	Building	Eligible (C)	SSP	A, C, and G
J8-1862	Hypergol Oxidizer Facility	1979	8BR2112	Structure	Eligible (C)	SSP	A, C, and G
J8-1906	Hypergol Fuel Facility	1979	8BR2113	Structure	Eligible (C)	SSP	A, C, and G
	LC 39: Pad B Historic District	1967-85	8BR1687	District	Listed	Apollo/SSP	A, C, and G
J7-0337	LC 39: Pad B	1964-68	8BR2010	Structure	Listed (I)	Apollo	A, C, and G
					Eligible (I) and (C) to 39B H.D.	SSP	A, C, and G
J7-0242	Foam Building	1968	None	Structure	Listed (C)	Apollo	A, C, and G
J7-0338	Compressed Air Building	1967	None	Structure	Listed (C)	Apollo	A, C, and G
J7-0432	Remote Air Intake Building	1967	None	Building	Listed (C)	Apollo	A, C, and G
J7-0537	Azimuth Alignment Station	1967	None	Structure	Listed (C)	Apollo	A, C, and G
J7-0132	Operations Support Building B-1	1967	8BR2114	Building	Listed (C)	Apollo	A, C, and G
					Eligible (C)	SSP	
J7-0140	High Pressure GH2 Facility	1967	8BR2115	Structure	Listed (C)	Apollo	A, C, and G
					Eligible (C)	SSP	
J7-0182	LOX Facility	1967	8BR2116	Structure	Listed (C)	Apollo	A, C, and G
					Eligible (C)	SSP	
J7-0183	Camera Pad B No. 6	1968	8BR2117	Structure	Listed (C)	Apollo	A, C, and G
					Eligible (C)	SSP	
J7-0191	Camera Pad B No. 1	1968	8BR2118	Structure	Listed (C)	Apollo	A, C, and G
					Eligible (C)	SSP	

RELEASED - Printed documents may be obsolete; validate prior to use.

NRHP LISTED AND ELIGIBLE HISTORIC FACILITIES (cont.).

Facility No.	Facility	Built	FMSF No.	NRHP Resource Type	NRHP Status – Listed, Eligible, Individual (I), Contributing (C)	Significant Historic Context(s)	Criterion/ Criteria Consideration [1]
J7-0192	LH2 Facility	1967	8BR2119	Structure	Listed (C)	Apollo	A, C, and G
					Eligible (C)	SSP	
J7-0231	Electrical Equipment Building No. 2	1967	8BR2120	Building	Listed (C)	Apollo	A, C, and G
					Eligible (C)	SSP	
J7-0241	Electrical Equipment Building No. 1	1967	8BR2121	Building	Listed (C)	Apollo	A, C, and G
					Eligible (C)	SSP	
J7-0243	Operations Support Building B-2	1967	8BR2122	Building	Listed (C)	Apollo	A, C, and G
					Eligible (C)	SSP	
J7-0331	Slidewire Termination Facility	1967	8BR2123	Structure	Listed (C)	Apollo	A, C, and G
					Eligible (C)	SSP	
J7-0342	Camera Pad B No. 2	1967	8BR2124	Structure	Listed (C)	Apollo	A, C, and G
					Eligible (C)	SSP	
J7-0385	Water Chiller Building	1968	8BR2125	Building	Listed (C)	Apollo	A, C, and G
					Eligible (C)	SSP	
J7-0584	Camera Pad B No. 4	1968	8BR2126	Structure	Listed (C)	Apollo	A, C, and G
					Eligible (C)	SSP	
J7-0589	Camera Pad B No. 3	1968	8BR2127	Structure	Listed (C)	Apollo	A, C, and G
					Eligible (C)	SSP	
J7-0240	Flarestack	1985	8BR2128	Structure	Eligible (C)	SSP	A, C, and G
J7-0288	Water Tank	1981	8BR2129	Structure	Eligible (C)	SSP	A, C, and G
J7-0490	Hypergol Oxidizer Facility[d]	1981	8BR2130	Structure	Eligible (C)	SSP	A, C, and G
J7-0491	Electrical Equipment Building No. 3[d]	1981	8BR2131	Building	Eligible (C)	SSP	A, C, and G

RELEASED - Printed documents may be obsolete; validate prior to use.

NRHP LISTED AND ELIGIBLE HISTORIC FACILITIES (cont.).

Facility No.	Facility	Built	FMSF No.	NRHP Resource Type	NRHP Status – Listed, Eligible, Individual (I), Contributing (C)	Significant Historic Context(s)	Criterion/ Criteria Consideration [1]
J7-0534	Hypergol Fuel Facility[d]	1981	8BR2132	Structure	Eligible (C)	SSP	A, C, and G
J7-0535	Electrical Equipment Building No. 4 [d]	1981	8BR2133	Building	Eligible (C)	SSP	A, C, and G
	Shuttle Landing Facility (SLF) Historic District		8BR1986	District	Eligible	SSP	A, C, and G
UK-0027	Shuttle Landing Facility (Runway)	1976	8BR1987	Structure	Eligible (I) and contributing to SLF H.D.	SSP	A, C, and G
J6-2313	Landing Aids Control Building	1976	8BR1988	Building	Eligible (I) and contributing to SLF H.D.	SSP	A, C, and G
J6-2262	Mate-Demate Device [d]	1977-78	8BR1989	Structure	Eligible (I) and contributing to SLF H.D.	SSP	A, C, and G
	Orbiter Processing Historic District		8BR1990	District	Eligible	SSP	A, C, and G
K6-894	Orbiter Processing Facility (OPF)[l]	1977	8BR1991	Building	Eligible (I) and contributing to OPF H.D.	SSP	A, C, and G
K6-696	Orbiter Processing Facility High Bay 3 (OPF-3)/SSMEPF[l]	1987	8BR1992	Building	Eligible (I) and contributing to OPF H.D.	SSP	A, C, and G
K6-794	Thermal Protection System Facility	1988	8BR1994	Building	Eligible (I) and contributing to OPF H.D.	SSP	A, C, and G
	SRB Disassembly and Refurbishment Complex Historic District		8BR1996	District	Eligible	SSP	A and G
66250	Hangar AF	1962	8BR2001	Building	Eligible (C)	SSP	A and G
66251	High Pressure Gas Facility	1963	8BR2002	Building	Eligible (C)	SSP	A and G
66240	High Pressure Wash Facility	1979	8BR2003	Building	Eligible (C)	SSP	A and G
66242	First Wash Building	1979	8BR2004	Building	Eligible (C)	SSP	A and G
66244	SRB Recovery Slip	1979	8BR2005	Structure	Eligible (C)	SSP	A and G

RELEASED - Printed documents may be obsolete; validate prior to use.

NRHP LISTED AND ELIGIBLE HISTORIC FACILITIES (cont.).

Facility No.	Facility	Built	FMSF No.	NRHP Resource Type	NRHP Status – Listed, Eligible, Individual (I), Contributing (C)	Significant Historic Context(s)	Criterion/ Criteria Consideration [1]
66310	SRB Paint Building	1984	8BR2006	Building	Eligible (C)	SSP	A and G
66320	Robot Wash Building	1987	8BR2007	Building	Eligible (C)	SSP	A and G
66249	Thrust Vector Control Deservicing Building	1985	8BR2008	Building	Eligible (C)	SSP	A and G
66340	Multi-Media Blast Facility	1992	8BR2009	Building	Eligible (C)	SSP	A and G
	Hypergolic Maintenance and Checkout Area (HMCA) Historic District		8BR2015	District	Eligible	SSP	A
M7-0961	Hypergol Module Processing North[d]	1964	8BR1993	Building	Eligible (I)/C to HMCA H.D.	SSP	A and G
M7-1061	Hypergol Support Building[d]	1964	8BR2000	Building	Eligible (C)	SSP	A and G
M7-1212	Hypergol Module Processing South[l]	1964	8BR2933	Building	Eligible (I)/C to HMCA H.D.	SSP	A and G
	NASA KSC Railroad System Historic District		8BR2932	District	Eligible	SSP	A and G
UK-022	Railroad Track		8BR2931		Eligible (C)	SSP	A and G
H2-1198	Jay Jay Bridge		8BR2906		Eligible (C)	SSP	A and G
	Locomotive 1		8BR2923		Eligible (C)	SSP	A and G
	Locomotive 2[t]		8BR3043		Eligible (C)	SSP	A and G
	Locomotive 3		8BR3044		Eligible (C)	SSP	A and G
NLAX170	70-Ton Aft Skirt Car		8BR2908		Eligible (C)	SSP	A and G
NLAX171	70-Ton Aft Skirt Car [t]		8BR3042		Eligible (C)	SSP	A and G
	NASA-owned CCAFS Industrial Area Historic District[3]		8BR3073	District	Eligible	Project Mercury ELV/SSP	A and C
1728	Hangar N[l]	1958	8BR3069	Building	Eligible (C)	SSP	A and C
54928	Little N Storage Building	1958	8BR2190	Building	Eligible (C)	SSP	A and C
55005	Hangar M Annex	1963	8BR2972	Building	Eligible (C)	SSP	A and C

RELEASED - Printed documents may be obsolete; validate prior to use.

Facility No.	Facility	Built	FMSF No.	NRHP Resource Type	NRHP Status – Listed, Eligible, Individual (I), Contributing (C)	Significant Historic Context(s)	Criterion/ Criteria Consideration [1]
	NASA-owned CCAFS Industrial Area Historic District[3] (cont.)		8BR3073	District	Eligible	Project Mercury ELV/SSP	A and C
60540	Solar Array Test Building	1966	8BR2977	Building	Eligible (C)	ELV	A and C
60650	E&O Building[t]	1961	8BR2975	Building	Eligible (C)	Project Mercury/ELV	A and C
60680	Missile Assembly Building AE	1959	8BR2976	Building	Eligible (I)/C to CCAFS Industrial Area H.D.	ELV	A, Themes C and D
1726	Hangar S	1959	8BR3070	Building	Eligible (I)/C to CCAFS Industrial Area H.D.	Project Mercury	A, B, and C Theme B

1- Criterion A: Event, Criterion B: Person, Criterion C: Design/Construction; Criteria Consideration G: Properties that have achieved significance within the last 50 years.
2 - Orbiter Atlantis was originally a Johnson Space Center (JSC) asset, transferred to KSC for display at the KSC Visitor Complex.
3 - Hangar AF Complex is also contributing to the NASA-owned Cape Canaveral Air Force Station Industrial Area Historic District (9 facilities).
Status of Facility: d – demolished, l – leased, t – transferred out of NASA ownership
H.D. - Historic District
Themes: A – Technical Foundations before 1958; B – The Effort to Land a Man on the Moon; C – The Exploration of Planets and the Solar System; D – The Role of Scientific and Communications Satellites

RELEASED - Printed documents may be obsolete; validate prior to use.

APPENDIX F: Collections from KSC Archaeological Sites

RELEASED - Printed documents may be obsolete; validate prior to use.

ARCHAEOLOGICAL COLLECTIONS FROM KSC SITES
(Current as of October 2014)

Site No. Site Name	Collector/ Donor	Repository	Acc. No.	Cat. No.	Specimens	Cubic feet	No. Boxes/ Bags	Human Remains
8BR62 MOORE MOUND	Long 1965	FLMNH	4595; 4605	103719; 103790	61 Abo. Sherds, 3 Shell Tools	0.235	3 boxes	NO
	Griffin and Miller 1978	BAR	93A.512		5 Abo. Sherds	*(1)	1 bag	NO
	Ehrenhard 1976	SEAC	SEAC-191 (CANA-1)	CANA 000092	15 Pcs. Human Remains (MNI= 1)	*(2)		YES
8BR77B NAUMANS PLACE MIDDEN	ACI 1992	SEAC	SEAC-1744 (CANA-97)		45 Abo. Sherds	*(3)	1 bag	NO
8BR78 DUMMETT'S PLACE	Long 1965; McMullen 1973	FLMNH	4595; 73-13	103720; A3701	37 Abo. Sherds	0.037	2 boxes	NO
8BR78A DUMMETT MIDDEN	ACI 1992	SEAC	SEAC-1744 (CANA-97)		3 Abo. Sherds, 50 Pcs. Animal Bone	*(3)	1 bag	NO
8BR78B DUMMETT HMSTD	Griffin and Miller 1978	BAR	93A.514		Abo. Sherds. Hist. Metal, Glass frag.	*(1)	1 bag	NO
8BR79 TITUSVILLE BEACH; CHESTER SHOALS	Long 1965; McMullen 1973	FLMNH	4595; 73-13	103721; A3702	445 Abo. Sherds, 8 Hist. Sherds, 4 Stone Tools	0.312	6 boxes	NO
	ACI 1991	SEAC	SEAC-1744 (CANA-97)		4 Abo. Sherds, Hist. Glass, ceramics, metal, brick	*(3)	1 bag	NO
8BR139 DUMMIT GROVE NE	Pat McMullen	FLMNH	73-13	A3714	5 Shell Tools, Abo. Sherds, 1 Pc. Animal Bone			NO
	ACI 1996	SEAC	SEAC-1745 (CANA-98)		363 Abo. Sherds, 2 Lithics, 1 Shell Tool, 1194 Pcs. Animal Bone	0.25	3 bags	NO

RELEASED - Printed documents may be obsolete; validate prior to use.

ARCHAEOLOGICAL COLLECTIONS FROM KSC SITES (Current as of October 2014) (cont.).

Site No. Site Name	Collector/ Donor	Repository	Acc. No.	Cat. No.	Specimens	Cubic feet	No. Boxes/ Bags	Human Remains
8BR141 ONION ISLAND	Long 1965	FLMNH	4595	103728	11 Abo. Sherds, 6 Pcs. Human Remains	0.030	1 box	YES
8BR142 BUTLER CAMPBELL'S MOUND	Ehrenhard 1976	SEAC	SEAC-191 (CANA-1)	CANA 000094	4 pcs. Human Remains (MNI= 1)	*(2)		YES
				CANA 000061	1 pc. Human Remains (MNI= 1)	*(2)		YES
8BR143 RAGIN MIDDEN	Long 1965, 1967	FLMNH	4595, 4605	103794-103801	43 Abo. Sherds, 1 Shell Tool	1.366	11 (variable sizes)	NO
	ACI 1996	SEAC	SEAC-1745 (CANA-98)		184 Abo. Sherds, 1057 Pcs. Animal Bone	0.50	5 bags	NO
	Ehrenhard 1976	SEAC	SEAC-191 (CANA-1)		78 Abo. Sherds, 10 Shell, 2 Bone	*(2)		NO
8BR144 NO NAME	Long 1965	FLMNH	4595	103730	1 Abo. Sherd	0.007	1 box	NO
8BR145 CLARK SLOUGH	Long 1965	FLMNH	4595	103731	95 Abo. Sherds, 1 Lithic, Animal Bone	0.062	1 box	NO
	ACI 1996	SEAC	SEAC-1745 (CANA-98)		109 Abo. Sherds, 1 Lithic, 1129 Pcs Animal Bone	0.25	3 bags	NO
	Ehrenhard 1976	SEAC	SEAC-191 (CANA-1)	CANA 000028	10 Pcs. Human Remains (MNI=1), Abo. Sherds	*(2)		YES

RELEASED - Printed documents may be obsolete; validate prior to use.

ARCHAEOLOGICAL COLLECTIONS FROM KSC SITES (Current as of October 2014) (cont.).

Site No. Site Name	Collector/ Donor	Repository	Acc. No.	Cat. No.	Specimens	Cubic feet	No. Boxes/ Bags	Human Remains
8BR146 BULL CAMP MIDDEN	Long 1965	FLMNH	4595	103732	17 Abo. Sherds, Shell	0.030	1 box	NO
	ACI 1996	SEAC	SEAC-1745 (CANA-98)		14 Abo. Sherds, Shell	*(4a)	1 bag	NO
	Brewer 1991	SEAC	SEAC-963 (CANA-22)			*(6)		NO
8BR147 NO NAME	Long 1965	FLMNH	4595		12 Abo. Sherds			NO
	Brewer 1991	SEAC	SEAC-963 CANA-53		3 Abo. Sherds, 2 Pcs. Bone, 1 Metal Fragment, Shell			NO
8BR148 NO NAME	Long 1965	FLMNH	4595	103733	20 Abo. Sherds	0.030	1 box	NO
	Brewer 1991	SEAC	SEAC-963 (CANA-55)			*(6)		NO
8BR149 NO NAME	Long 1965	FLMNH	4595	103734		0.062	1 box	NO
	Brewer 1991	SEAC	SEAC-963 (CANA-56)			*(6)		NO
8BR151 NO NAME	Long 1965	FLMNH	4595	103735		0.007	1 box	NO
	Ehrenhard 1976	SEAC	SEAC-191 (CANA-1)		32 Abo. Sherds, 2 Shell Tools, 6 Pcs. Bone	*(2)		NO
	Brewer 1991	SEAC	SEAC-963 (CANA-54)			*(6)		

RELEASED - Printed documents may be obsolete; validate prior to use.

ARCHAEOLOGICAL COLLECTIONS FROM KSC SITES (Current as of October 2014) (cont.).

Site No. Site Name	Collector/ Donor	Repository	Acc. No.	Cat. No.	Specimens	Cubic feet	No. Boxes/ Bags	Human Remains
8BR153 PARDON	Long 1965	FLMNH	4595	103736	12 Abo. Sherds, 2 Shell Tools, Coquina	0.062	1 box	NO
	Ehrenhard 1976	SEAC	SEAC-191 (CANA-1)			*(2)		NO
8BR154 EDDY CREEK	Long 1965	FLMNH	4595	103737	13 Abo. Sherds	0.007	1 box	NO
	Ehrenhard 1976	SEAC	SEAC-191 (CANA-1)			*(2)		NO
8BR155 GRANNY COVE	Long 1965	FLMNH	4595	103738		0.007	1 box	NO
	Griffin and Miller 1978	BAR	93A.511		Abo. Sherds, Hist. Sherds, Animal Bone, Metal Frag.	*(1)	2 bags	NO
	ACI 1992	SEAC	SEAC-1744 (CANA-97)		50 Abo. Sherds	*(3)	1 bag	NO
8BR157 KARS PARK	Long 1965	FLMNH	4595; 73-13	103739; A3704	14 Abo. Sherds	0.092	2 boxes	NO
	ACI 1991	SEAC	SEAC-1744 (CANA-97)		Abo. Sherds, Lithics, Animal Bone, Shell	*(3)		NO
8BR159 NO NAME (VANN'S ISLAND)	Long 1965	Unknown			7 Abo. Sherds			NO
8BR169 SOUTH ACCESS ROAD	Smith 1973	Unknown			132 Abo. Sherds			NO
	ACI 1991	SEAC	SEAC-1744 (CANA-97)		58 Abo. Sherds	*(3)		NO

RELEASED - Printed documents may be obsolete; validate prior to use.

ARCHAEOLOGICAL COLLECTIONS FROM KSC SITES (Current as of October 2014) (cont.).

Site No. Site Name	Collector/ Donor	Repository	Acc. No.	Cat. No.	Specimens	Cubic feet	No. Boxes/ Bags	Human Remains
8BR170 OPPOSITE FUTCH COVE	Smith 1973	Unknown			125 Abo. Sherds, Hist. Sherds, Glass, & Metal			NO
	Ste. Claire and Johnson 1988	SEAC	SEAC-1743 (CANA-96)		PHASE II: 8,225 Abo. Sherds; 94 Lithic Flakes; 30 Stone, Bone, Shell Tools, & Ornaments; 23,878 Pcs. Animal Bone; Hist. Sherds		44 boxes	NO
8BR170 OPPOSITE FUTCH COVE	Johnson 1992	SEAC	SEAC-1743 (CANA-96)		PHASE III: 12,251 Abo. Sherds; Animal Bones; Shell Tools; Bone Tools; Flotation Samples			
8BR171 STONY ISLAND	Dennis English	BAR	77A.96		Abo. Sherds, Animal Bone	*(1)	2 bags	NO
	Smith 1973	Unknown			1 Abo. Sherd			NO
8BR175 FORT ANN	Griffin and Miller 1978	BAR	93A.515		Hist. Household Items, Glass Frag.	*(1)	1 bag	NO
8BR183 PARDON ISLAND	Griffin and Miller 1978	BAR	93A.516		Abo. Sherds, Animal Bone	*(1)	1 bag	NO
8BR205 MAX HOECK MOUND AND MIDDEN *originally 8BR137	Long 1965	FLMNH (as 8BR137)	4595-4605	103727, 103791-103793	12 Abo. Sherds, 1 Shell Tool	0.152	4 boxes	NO
	Ehrenhard 1976	SEAC	SEAC-191 (CANA-57)			*(2)		NO
	Brewer 1991	SEAC	SEAC-963 (CANA-22)			*(6)		NO

RELEASED - Printed documents may be obsolete; validate prior to use.

ARCHAEOLOGICAL COLLECTIONS FROM KSC SITES (Current as of October 2014) (cont.).

Site No. Site Name	Collector/ Donor	Repository	Acc. No.	Cat. No.	Specimens	Cubic feet	No. Boxes/ Bags	Human Remains
8BR206 PEPPER HAMMOCK *originally 8BR158	ACI 1991	SEAC	SEAC-1744 (CANA-97)		287 Abo. Sherds, Animal Bone, 11 Lithics, Shell	*(3)		NO
8BR217 20TH CENTURY HISTORIC DEPOSIT	Water and Air 1983	BAR	93A.171		Hist. Metal and Glass Frags.	*(1)	2 bags	NO
8BR540 DAIGLE PLACE	Smith 1973	Unknown			4 Hist. Glass Frags.			NO
8BR541 HUGHES PLACE	ACI 1991	SEAC	SEAC-1744 (CANA-97)		Hist. sherds, brick, and glass	*(3)		NO
8BR542 PARSONS PLACE	Smith 1973	Unknown			Hist. sherds, metal and glass			NO
	ACI 1991	SEAC	SEAC-1744 (CANA-97)		Hist. sherds, glass	*(3)		NO
8BR543 GRIFFITH PLACE	ACI 1991	SEAC	SEAC-1744 (CANA-97)		Hist. sherds, brick, glass, and metal	*(3)		NO
8BR555 EDDY CREEK BOAT LAUNCH AREA	Bryne 1989	SEAC	SEAC-835 (CANA-35)		Abo. Sherds	*(5)		NO
8BR556 PLAYALINDA BEACH PARKING AREA NO. 8	Bryne 1989	SEAC	SEAC-835 (CANA-35)		Abo. Sherds	*(5)		NO

RELEASED - Printed documents may be obsolete; validate prior to use.

ARCHAEOLOGICAL COLLECTIONS FROM KSC SITES (Current as of October 2014) (cont.).

Site No. Site Name	Collector/ Donor	Repository	Acc. No.	Cat. No.	Specimens	Cubic feet	No. Boxes/ Bags	Human Remains
8BR582 DUNE AND SWALE	ACI 1990	SEAC	SEAC-1744 (CANA-97)		2 Lithics	*(3)		NO
8BR773 VIP WEST	ACI 1991	SEAC	SEAC-1744 (CANA-97)		Lithics (waste flakes)	*(3)		NO
	ACI 1996	SEAC	SEAC-1745 (CANA-98)		10 Abo. Sherds, 2 Lithics	*(4)		NO
8BR774 ASTRONAUT RD	ACI 1991	SEAC	SEAC-1744 (CANA-97)		66 Abo. Sherds, 1 Steatite (worked), 1 Lithics, 21 Pcs. Animal Bone	*(3)		NO
8BR910 SCORCHING MACHETE	ACI 1991	SEAC	SEAC-1744 (CANA-97)		58 Abo. Sherds	*(3)		NO
8BR911 HAPPY CREEK ONE	ACI 1991	SEAC	SEAC-1744 (CANA-97)		32 Abo. Sherds	*(3)		NO
8BR912 ROTTEN DOCK	ACI 1991	SEAC	SEAC-1744 (CANA-97)		30 Abo. Sherds	*(3)		NO
8BR913 LANDFILL SOUTH	ACI 1991	SEAC	SEAC-1744 (CANA-97)		22 Abo. Sherds, 19 Pcs. Animal Bone	*(3)		NO
8BR914 LC 41 SOUTH	ACI 1991	SEAC	SEAC-1744 (CANA-97)		18 Abo. Sherds, 1 Shell Tool, 32 Pcs. Animal Bone	*(3)		NO
8BR915 TITUSVILLE BEACH WEST #1	ACI 1991	SEAC	SEAC-1744 (CANA-97)		7 Abo. Sherds	*(3)		NO

RELEASED - Printed documents may be obsolete; validate prior to use.

ARCHAEOLOGICAL COLLECTIONS FROM KSC SITES (Current as of October 2014) (cont.).

Site No. Site Name	Collector/ Donor	Repository	Acc. No.	Cat. No.	Specimens	Cubic feet	No. Boxes/ Bags	Human Remains
8BR917 GATOR HOLE	ACI 1991	SEAC	SEAC-1744 (CANA-97)		15 Abo. Sherds	*(3)	1 bag	NO
8BR1606 KARS PARK NORTH	ACI 1991	SEAC	SEAC-1744 (CANA-97)		19 Abo. Sherds	*(3)	1 bag	NO
8BR1617 DUMMIT PLACE SOUTH	ACI 1992	SEAC	SEAC-1744 (CANA-97)		8 Abo. Sherds	*(3)	1 bag	NO
8BR1618 MINUTE FLAKE	ACI 1992	SEAC	SEAC-1744 (CANA-97)		1 Lithic	*(3)	1 bag	NO
8BR1619 DUMMIT CREEK NORTH MIDDEN	ACI 1992	SEAC	SEAC-1744 (CANA-97)		6 Abo. Sherds, 5 Pcs. Animal Bone	*(3)	1 bag	NO
8BR1620 SE OF NAUMANS PLACE	ACI 1992	SEAC	SEAC-1744 (CANA-97)		56 Abo. Sherds	*(3)	1 bag	NO
8BR1621 GRANNY COVE NORTH	ACI 1992	SEAC	SEAC-1744 (CANA-97)		8 Abo. Sherds	*(3)	1 bag	NO
8BR1622 ALLENHURST MIDDEN	ACI 1992	SEAC	SEAC-1744 (CANA-97)		27 Abo. Sherds	*(3)	1 bag	NO
8BR1623 DUCKROOST COVE	ACI 1992	SEAC	SEAC-1744 (CANA-97)		4 Abo. Sherds	*(3)	1 bag	NO
8BR1625 DIKE ACCESS RD	ACI 1992	SEAC	SEAC-1744 (CANA-97)		11 Abo. Sherds, 1 Hist. Sherd	*(3)	1 bag	NO

RELEASED - Printed documents may be obsolete; validate prior to use.

ARCHAEOLOGICAL COLLECTIONS FROM KSC SITES (Current as of October 2014) (cont.).

Site No. Site Name	Collector/ Donor	Repository	Acc. No.	Cat. No.	Specimens	Cubic feet	No. Boxes/ Bags	Human Remains
8BR1627 PATILLO CREEK	ACI 1992	SEAC	SEAC-1744 (CANA-97)		1 Abo. Sherd	*(3)	1 bag	NO
8BR1628 LOST IN THE GRASS	ACI 1992	SEAC	SEAC-1744 (CANA-97)		21 Abo. Sherds	*(3)	1 bag	NO
8BR1629 FALLOW GROVE	ACI 1992	SEAC	SEAC-1744 (CANA-97)		2 Abo. Sherds	*(3)	1 bag	NO
8BR1630 SHILOH SAND HILLS	ACI 1992	SEAC	SEAC-1744 (CANA-97)		104 Abo. Sherds	*(3)	1 bag	NO
8BR1632 EDGAR/CAMPBELL MIDDEN	ACI 1992	SEAC	SEAC-1744 (CANA-97)		15 Abo. Sherds, 1 Hist. Sherd, 4 Shell Tools	*(3)	1 bag	NO
	ACI 1996	SEAC	SEAC-1745 (CANA-98)		210 Abo. Sherds, 4 Hist. Sherds, 1 Shell Tool, 218 Pcs. Animal Bone	*(4b)	2 bags	NO
8BR1633 APIARY 53	ACI 1992	SEAC	SEAC-1744 (CANA-97)		9 Abo. Sherds. 4 Shell Tools	*(3)	1 bag	NO
	ACI 1996	SEAC	SEAC-1745 (CANA-98)		114 Abo. Sherds, 50 Pcs. Animal Bone	*(4b)	2 bags	NO
8BR1663 ORBITER STORAGE	ACI 1996	SEAC	SEAC-1745 (CANA-98)		2 Abo. Sherds	*(4b)	1 bag	NO
8BR1664 ARCHAIC SURFACE SCATTER	ACI 1996	SEAC	SEAC-1745 (CANA-98)		4 Lithics	*(4b)	1 bag	NO

RELEASED - Printed documents may be obsolete; validate prior to use.

ARCHAEOLOGICAL COLLECTIONS FROM KSC SITES (Current as of October 2014) (cont.).

Site No. Site Name	Collector/ Donor	Repository	Acc. No.	Cat. No.	Specimens	Cubic feet	No. Boxes/ Bags	Human Remains
8BR1665 OLD CANAL MIDDEN	ACI 1996	SEAC	SEAC-1745 (CANA-98)		2 Abo. Sherds, Midden Shell	*(4b)	1 bag	NO
8BR1666 MARSH CROSSING	ACI 1996	SEAC	SEAC-1745 (CANA-98)		15 Abo. Sherds	*(4b)	1 bag	NO
8BR1667 THIN SAND RIDGE	ACI 1996	SEAC	SEAC-1745 (CANA-98)		1 Abo. Sherd	*(4b)	1 bag	NO
8BR1668 CERAMIC SURFACE CLUSTER	ACI 1996	SEAC	SEAC-1745 (CANA-98)		5 Abo. Sherds	*(4b)	1 bag	NO
8BR1669 SPOONBILL	ACI 1996	SEAC	SEAC-1745 (CANA-98)		26 Abo. Sherds	*(4b)	1 bag	NO
8BR1670 HAULOVER CANAL MIDDEN	ACI 1996	SEAC	SEAC-1745 (CANA-98)		8 Abo. Sherds, 2 Hist. Sherds	*(4b)	1 bag	NO
8BR1671 HAULOVER ARTIFACT SCATTER	ACI 1996	SEAC	SEAC-1745 (CANA-98)		13 Abo. Sherds	*(4b)	1 bag	NO
8BR1672 HAULOVER POND MIDDEN	ACI 1996	SEAC	SEAC-1745 (CANA-98)		6 Abo. Sherds, 1 Lithic, Animal Bone	*(4b)	1 bag	NO
8BR1673 HAULOVER SAND MOUND AND MIDDEN	ACI 1996	SEAC	SEAC-1745 (CANA-98)		84 Abo. Sherds, 7 Shell Tools, 75 Pcs. Animal Bone	*(4b)	1 bag	NO

RELEASED - Printed documents may be obsolete; validate prior to use.

ARCHAEOLOGICAL COLLECTIONS FROM KSC SITES (Current as of October 2014) (cont.).

Site No. Site Name	Collector/ Donor	Repository	Acc. No.	Cat. No.	Specimens	Cubic feet	No. Boxes/ Bags	Human Remains
8BR1674 76TH ST NW MIDDEN	ACI 1996	SEAC	SEAC-1745 (CANA-98)		1 Abo. Sherd, 1 Shell Tool	*(4b)	1 bag	NO
8BR1675 LITTLE SHELL POINT	ACI 1996	SEAC	SEAC-1745 (CANA-98)		1 Abo. Sherd	*(4b)	1 bag	NO
8BR1677 CAMPBELL/JACKSON SHEET MIDDEN	ACI 1996	SEAC	SEAC-1745 (CANA-98)		8 Abo. Sherds, 3 Shell Tools, 20 Pcs. Animal Bone	*(4b)	1 bag	NO
8BR1678 FRIABLE SHERDS	ACI 1996	SEAC	SEAC-1745 (CANA-98)		11 Abo. Sherds	*(4b)	1 bag	NO
8BR1679 DIFFUSE CERAMIC SCATTER	ACI 1996	SEAC	SEAC-1745 (CANA-98)		5 Abo. Sherds	*(4b)	1 bag	NO
8BR1680 RELIC GROVE	ACI 1996	SEAC	SEAC-1745 (CANA-98)		89 Abo. Sherds, 2 Stone Tools, 17 Pcs. Animal Bone	*(4b)	1 bag	NO
8BR2364 BOTTLE DUMP SITE	ACI 2009	KSC	N/A		80 Artifacts, mixed selectivity, ceramic – non-aboriginal, glass, metal – nonprecious		1 box	NO
8V0129 SCOBEY PLACE/ BILL'S HILL	Long 1965	FLMNH	4595	103741	20 Abo. Sherds			NO
	Ehrenhard 1976	SEAC	SEAC-191 (CANA-1)	CANA 000007	3 Pcs. Human Remains (MNI=1)	*(2)		YES

RELEASED - Printed documents may be obsolete; validate prior to use.

ARCHAEOLOGICAL COLLECTIONS FROM KSC SITES (Current as of October 2014) (cont.).

Site No. Site Name	Collector/ Donor	Repository	Acc. No.	Cat. No.	Specimens	Cubic feet	No. Boxes/ Bags	Human Remains
8VO130 ROSS HAMMOCK MIDDEN	Bullen, Bullen, and Bryant 1963	FLMNH	4388	98328-98342	Abo. Sherds, Shell Tools			NO
	Bullen, Bullen, and Bryant 1963	FLMNH	4227	96339	Coquina			NO
	Ehrenhard 1976	SEAC	SEAC-191 (CANA-1)		20 Abo. Sherds	*(2)		NO
			SEAC-921 (CANA-1)		16 Pcs. Human Remains			YES
8V0131 ROSS HAMMOCK BURIAL MOUNDS	Bullen, Bullen, and Bryant 1963	FLMNH	4211	95914	Abo. Sherds			NO
	Ehrenhard 1976	SEAC	SEAC 01000	CANA 000105	5 Pcs. Human Remains (MNI= 1)			YES
	Unknown	SEAC	SEAC 01001	CANA 00104	5 Pcs. Human Remains (MNI= 1)			YES
8VO131A ROSS HAMMOCK BURIAL #1	Bullen, Bullen, and Bryant 1963	FLMNH	4388	98388-98344; 98396-98442	Human Remains (MNI= 81) Abo. Sherds, Hist. Sherds, glass, metal, and nails			YES
8VO131B ROSS HAMMOCK BURIAL #2	Bullen, Bullen, and Bryant 1963	FLMNH	4388	98382-98387	Abo. Sherds			NO
8V0143 MCCARTY PLACE	ACI 1996	KSC			Abo. Sherds, 1 Hist. Sherd, 35 Pcs. Animal bone, Metal	*(4a)	1 bag	NO

RELEASED - Printed documents may be obsolete; validate prior to use.

ARCHAEOLOGICAL COLLECTIONS FROM KSC SITES (Current as of October 2014) (cont.).

Site No. Site Name	Collector/ Donor	Repository	Acc. No.	Cat. No.	Specimens	Cubic feet	No. Boxes/ Bags	Human Remains
8V0160 SUGAR MILL RUINS	Jones 1973	BAR	74A.296		Abo. Sherds	*(1)	1 bag	NO
8V04371 SHILOH GROVE	ACI 1992	SEAC	SEAC-1744 (CANA-97)		1 Abo. Sherd	*(3)	1 bag	NO
8V04372 ONE SHERD	ACI 1992	SEAC	SEAC-1744 (CANA-97)		1 Abo. Sherd	*(3)	1 bag	NO
8V04373 LITTLE CREEK	ACI 1992	SEAC	SEAC-1744 (CANA-97)		13 Abo. Sherds	*(3)	1 bag	NO
8V04374 MICRO FLAKE	ACI 1992	SEAC	SEAC-1744 (CANA-97)		1 Lithic	*(3)	1 bag	NO
8V06785 SPIKE POINT	ACI 1996	SEAC	SEAC-1745 (CANA-98)		1 Lithic Tool	*(4a)	1 bag	NO
8VO6786 KUHL MIDDEN	ACI 1996	SEAC	SEAC-1745 (CANA-98)		413 Abo. Sherds, 1655 pcs. Animal Bone	*(4a)	5 bags	NO

*(1) BAR collection contains material from 8 sites and totals 1 cu. ft.
*(2) SEAC-191 contains material from 10 sites and totals 1 cu. ft.
*(3) SEAC-1744 (ACI 1990-1992) collection contains material from 39 sites and totals 2 cu. ft.
*(4a) SEAC-1745 (ACI 1996) contains material from 4 sites and totals 1 cu. ft.
*(4b) ACI 1996 contains material from 17 sites and totals 1 cu. ft.
*(5) SEAC-835 collection contains material from 2 sites and totals 0.5 cu. ft.
*(6) SEAC-963 collection contains material from 5 sites and totals 1 cu. ft.
NOTE: 3 loan agreements are in place between NASA and CNS for transfer of collections (Accession Nos. CANA-00096, CANA-00097, and CANA-00098).

RELEASED - Printed documents may be obsolete; validate prior to use.