WHITE SANDS SPACE HARBOR AREA 1, RUNWAY 20/02 HAER No. NM-28-C
(Space Shuttle Landing Facility Area 1, Runway 20/02)
White Sands Missile Range
Extending 19,800 feet in a southwest/northeast direction, connecting with Runways 17/35 and 23/05
White Sands vicinity
Doña Ana County
New Mexico

PHOTOGRAPHS

WRITTEN HISTORICAL AND DESCRIPTIVE DATA

Historic American Engineering Record
National Park Service
U.S. Department of the Interior
Intermountain Regional Office
12795 Alameda Parkway
Denver, CO 80225-0287

HISTORIC AMERICAN ENGINEERING RECORD

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U.S.G.S. 7.5 Minute Las Cruces, New Mexico, Quadrangle, Universal Transverse Mercator Coordinates (center of runways): E 32.944408 N 106.41993 Zone 13S, NAD 1983.

Construction: 1988

Architect: Not known

Builder: Not known

Present Owner: Commander, U.S. Army White Sands Missile Range, New Mexico 88002-5018

Present Use: Vacant

Significance: Runway 20/02 was an essential component of the White Sands Space Harbor (WSSH) from 1988-2011. It is considered to have national significance and is eligible for listing in the National Register of Historic Places (NRHP) under Criterion A for its association with the NASA Space Shuttle Program (SSP) with a period of significance of 1976-2011. Because it achieved significance within the past fifty years, Criterion Consideration G also applies.

Report
Prepared by: Robbie D. Jones, Senior Historian
New South Associates
118 South 11th Street
Nashville, TN 37206

Date: September 2013

LIST OF ACRONYMS

ABGR	Alamogordo Bombing and Gunnery Range
ABS	Anti-lock Braking System
ACHP	Advisory Council on Historic Preservation
ACI	Archaeological Consultants, Inc.
AIAA	American Institute of Aeronautics and Astronautics
APE	Area of Potential Effects
ATC	Air Traffic Control
BTT	Basic Training Target
CCC	Civilian Conservation Corps
CIT	California Institute of Technology
CONEX	Container Express
DC-X	Delta Clipper, Experimental
DoD	Department of Defense
GPS	Global Positioning System
HAFB	Holloman Air Force Base
HPO	Historic Preservation Officer
HPWG	Historic Preservation Working Group
HUB	Harbor Utility Building
IGS	Inter Glide Slope
IHA	InoMedic Health Applications, LLC
JSC	Johnson Space Center
KSC	Kennedy Space Center
LC	Launch Complex
MD	McDonnell Douglas
MSBLS	Microwave Scanning Beam Landing System
MSFC	Marshall Space Flight Center
NASA	National Aeronautics and Space Administration
NAVAIDS	Navigational Aids
NEPA	National Environmental Policy Act
NHL	National Historic Landmark
NHPA	National Historic Preservation Act

NPS	National Park Service
NRHP	National Register of Historic Places
NSA	New South Associates
OCC	Operations Control Center
ORD	Army Ordinance Department
PAPI	Precision Approach Path Indicator
RFP	Request for Proposal
SCAPE	Self Contained Atmospheric Protective Ensemble
SHPO	State Historic Preservation Officer
SSP	Space Shuttle Program
SSRT	Single Stage Rocket Technology
STA	Shuttle Training Aircraft
STS	Space Transportation System
TACAN	Tactical Air Navigation
TAL	Transoceanic Abort Landing
UHF	Ultrahigh Frequency
USAAF	United States Army Air Force
USAF	United States Air Force
VITT	Vehicle Integration Test Team
WPA	Works Progress Administration
WSMR	White Sands Missile Range
WSNM	White Sands National Monument
WSPG	White Sands Proving Ground
WSSH	White Sands Space Harbor
WSTF	White Sands Test Facility

PART I. HISTORICAL INFORMATION

A. Physical History

1. DATE OF CONSTRUCTION

Runway 20/02 was constructed in 1988.

2. ENGINEER

Not known.

3. BUILDER/CONTRACTOR/SUPPLIER

Not known.

4. ORIGINAL PLANS

A single sheet of to-scale engineering drawings were created in 1988 for Runway 20/02. The engineer-of-record is unknown.

5. ALTERNATIONS AND ADDITIONS

The Runway is constructed of a compacted, natural gypsum surface and has been upgraded with modern navigational aids such as lighting and asphalt directional markings.

Once the runway was abandoned in 2011, routine maintenance ceased. Due to the harsh desert environment, the runway began to deteriorate quickly. The U.S. Army initiated occupation of WSSH in the summer of 2012.

PART II. STRUCTURAL/DESIGN INFORMATION

A. GENERAL DESCRIPTION

1. CHARACTER

Located in Area 1, the three natural surface gypsum runways, including Runway 20/02, are located within a 10-square mile area at WSSH. The runways are constructed of compacted gypsum sand with a 1-2" thick soft top layer and a hard-paced under layer. Due to the harsh desert environment, the runways required constant grading, repairs, and maintenance.

Each of the three runways duplicates a shuttle landing runway: 17/35 replicates the runway at Kennedy Space Center in Florida; 23/05 replicates the runway at Edwards Air Force Base in California; and 20/02 replicates the Transoceanic Abort Landing (TAL) runways in other countries.

Runway 20/02 is located in the northwest quadrant created by the intersection of Runways 17/35 and 23/05. Runway 20/02 is oriented along a northeast-southwest axis and measures 19,800′ in length and 200′ in width. This runway does not feature maintained overruns. Navigational aids such as lighting and markings made of asphalt are located along its entire length.

At 6,500′ from the northeast end of runway 20 is the Nominal Aimpoint and at 5,500′ is the High-Wind Aimpoint with PAPI lights. At 2,000′ into the runway at the northeast end are the IGS Bar/Ball lights.

2. DESCRIPTION

The following is a more detailed description of Runway 20/02, also known as "TAL."

Runway 20/02 is smaller than the other two runways, measuring 19,800′ by 200′. This natural surface gypsum runway is located on a northeastern/southwestern diagonal direction along the north side of the other two runways. The runway features runway markings and navigational aids, including: one set of Precision

Approach Path Indicator (PAPI) lights, touchdown markers, distance-to-go markers, xenon lights, and nominal night strobes.

This runway was constructed to replicate the following runways: Transoceanic Abort Landing (TAL) runways at Zaragoza Air Base in Spain; Moron Air Base in Spain; and Istres Air Base in France, as well as former runways at Ben Guerir Air Base, Morocco (1988-2002); Casablanca, Morocco (1986-1988); and Banjul International Airport, The Gambia (1988-2002). Like the other two runways at WSSH, Runway 20/02 was used primarily for astronaut training after 1984, with Shuttle pilots simulating landings at Transatlantic Abort Landing sites.

3. CONDITION OF FABRIC

When documented in March 2012, the Runway had been abandoned for over six months and was in fair condition. Due to the harsh desert environment and lack of maintenance, the runway had quickly deteriorated due to shifting sands, flash floods, and extreme temperature variations.

B. CONSTRUCTION

The Runway is constructed of compacted natural surface gypsum with landing aid markings made of asphalt.

C. MECHANICAL/OPERATION

The Runway does not feature any mechanical equipment, with the exception of navigational aids, which are documented separately.

PART III. SOURCES OF INFORMATION

A. ENGINEERING PLANS AND DRAWINGS

A single sheet of to-scale engineering drawings were created in 1988 for Runway 20/02. The engineer-of-record is unknown. In addition, plans were created around 1988 for construction of the asphalt navigational markings.

B. EARLY VIEWS AND HISTORICAL DATA

Historic photographs and maps of the WSSH, including the Runways, are very limited. Some of these views can be found on pages 20-23 of this document. All views are captioned and dated as available. The other historical data comes from a variety of sources cited in the Bibliography below.

The historic photographs and most of the historical data used in this documentation came from sources within WSTF and WSSH. Other more current imagery was obtained from the online WSTF Media Archive. Many of the original photographs have been donated to the WSMR Museum for digitization and curation. A body of recent aerial photographs were located and photocopied for inclusion in the HAER document to supplement the current ground photography.

C. INTERVIEWS

The following NASA and WSMR employees were interviewed for this documentation.

Robert E. Mitchell, WSTF Manager, September 2011.

Frank Offutt, WSSH Manager, September 2011.

Timothy Davis, WSTF Historic Preservation Officer, September 2011 and March 2012.

Bill Godby, WSMR Historic Preservation Officer, September 2011.

Doyle Piland, WSMR Museum Archivist, September 2011.

Dennis G. Perrin, NASA Johnson Space Center, Houston, Texas, and WSTF Facility Manager (1975-1989), June 2013.

D. BIBLIOGRAPHY

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E. LIKELY SOURCES NOT YET INVESTIGATED

Research was conducted at WSSH and WSTF using primary and secondary sources. Sources that were not investigated that may contain secondary information are archived at NASA's Lyndon B. Johnson Space Center in Houston, Texas.

Additional oral history interviews with other engineers and technicians could also prove useful.

PART IV. PROJECT INFORMATION

In 2011-2012, New South Associates (NSA), under contract with InoMedic Health Applications, LLC (IHA) of Kennedy Space Center, Florida, and in coordination with NASA and the U.S. Army, conducted background research and a historic architecture survey of resources at the NASA WSSH. The survey included the documentation and evaluation for NRHP eligibility for seventy-two resources located in four distinct areas. Based on this research, NSA determined that no properties remain at WSSH from the period prior to NASA acquisition in 1963 except for the footprint of the packed gypsum Runway 17/35.[1]

NSA recommended that the three NASA WSSH Runways and the Control Tower in Area 1 were individually eligible for listing in the NRHP and eligible as contributing resources to the "WSSH Shuttle Landing Facility District" under Criterion A and Criterion Consideration G for their association with the NASA SSP. None of the other sixty-eight inventoried properties were recommended individually eligible for listing in the NRHP due to lack of historical association with the NASA SSP or other historic contexts, lack of unique design or construction features, or insufficient integrity; however, nineteen of these properties, all of which lie within Area 1, were recommended as contributing resources to "WSSH Shuttle Landing Facility District," even though they were not recommended individually eligible for the NRHP. The historic district contains a total of twenty-eight resources: twenty-three are contributing and five are non-contributing.

After formally ending the SSP on August 31, 2011, NASA disposed of the WSSH and released use of the property to the U.S. Army WSMR. The property transfer was a federal undertaking on federally-owned property and subject to compliance with Section 106 of the NRHP Act of 1966, as amended. The undertaking resulted in an Adverse Effect to the NRHP-eligible WSSH Shuttle

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[1] Reed, Mary Beth, and Robbie D. Jones. "Historic Architecture Survey and National Register of Historic Places Evaluation of the NASA White Sands Space Harbor on the U.S. Army Whites Sands Missile Range, Doña Ana County, New Mexico." New South Associates, Stone Mountain, Georgia, 1998: 44-62. Unpublished report on file at NASA WSTF, Las Cruces, New Mexico.

Landing Facility District. To mitigate the adverse effects, NASA completed HAER Level II documentation of the historic district and relocated the Control Tower to the WSMR Museum for conservation, exhibition, and public interpretation.

The mitigation plan was defined in a Memorandum of Agreement (MOA), executed between NASA, the U.S. Army, and the NM-SHPO in August 2012. The properties within the historic district were documented with large format photography in March 2012.

APPENDIX- LOCATION MAPS AND HISTORICAL VIEWS

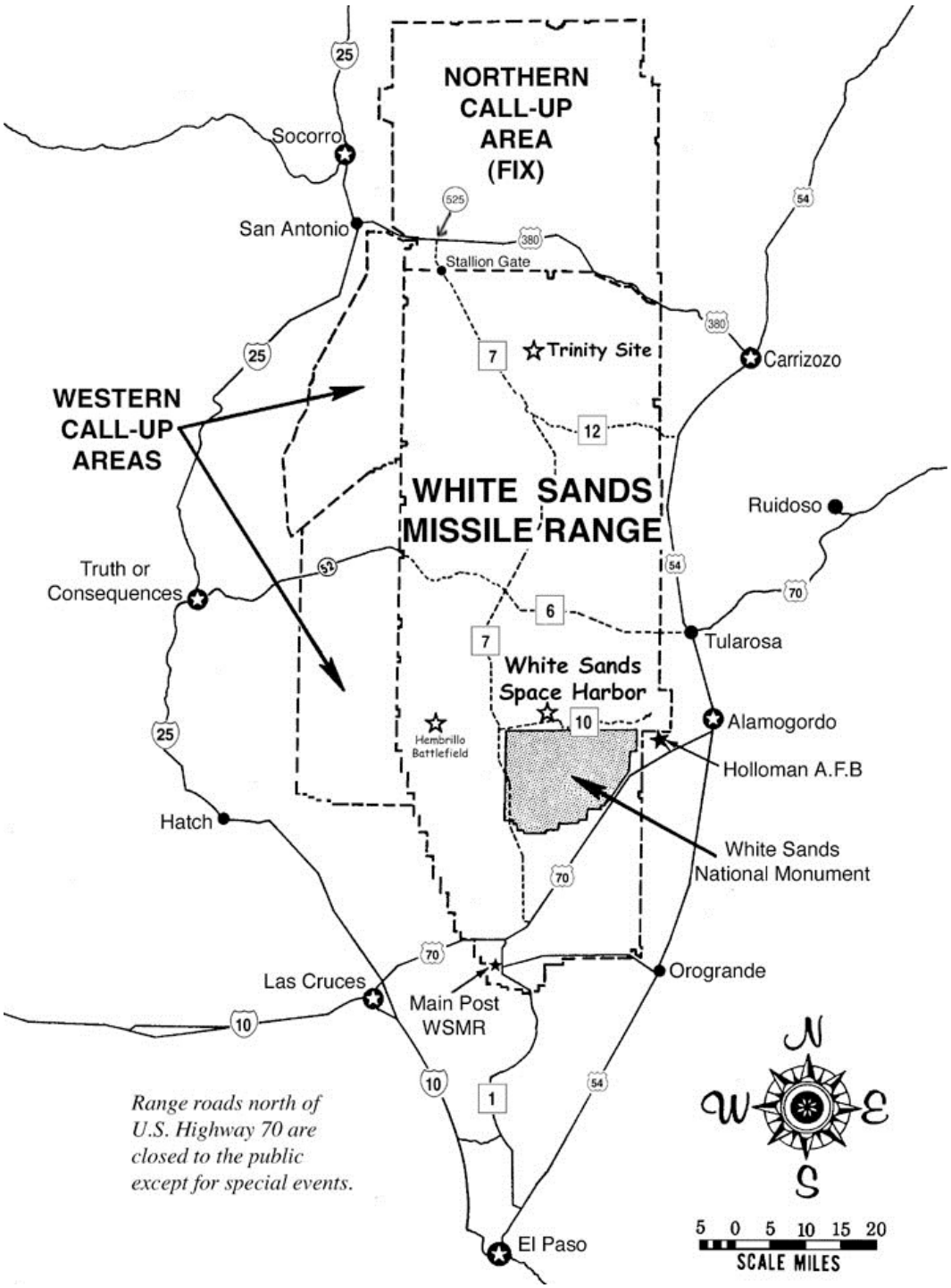

Figure 1. Map of White Sands Military Reservation showing White Sands Space Harbor (Source: U.S. Army).

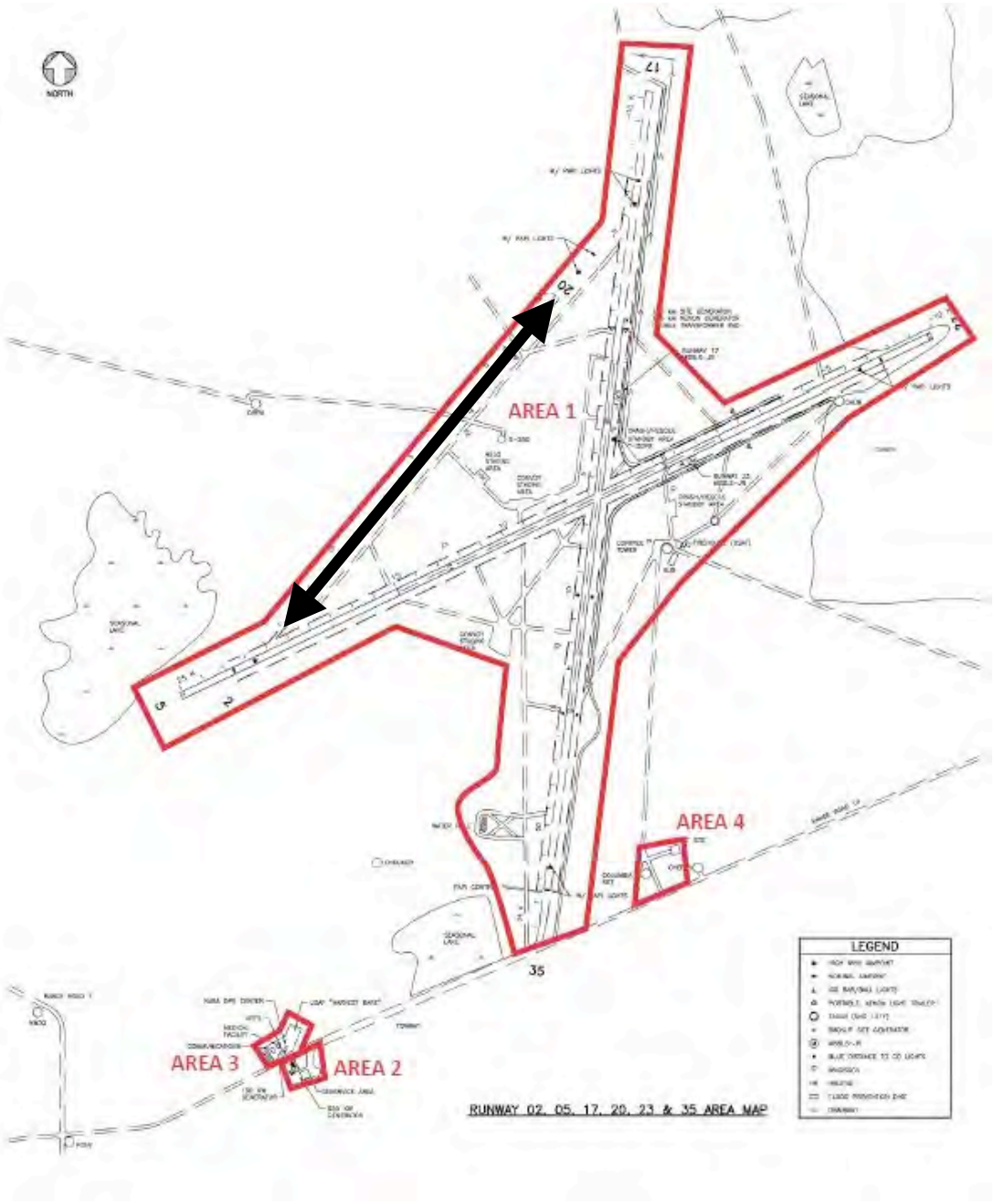

Figure 2. Map of White Sands Space Harbor showing location of Runway 20/02 in Area 1, which delineates the NRHP boundaries of the WSSH Shuttle Landing Facility District (Base Map Source: NASA WSTF).

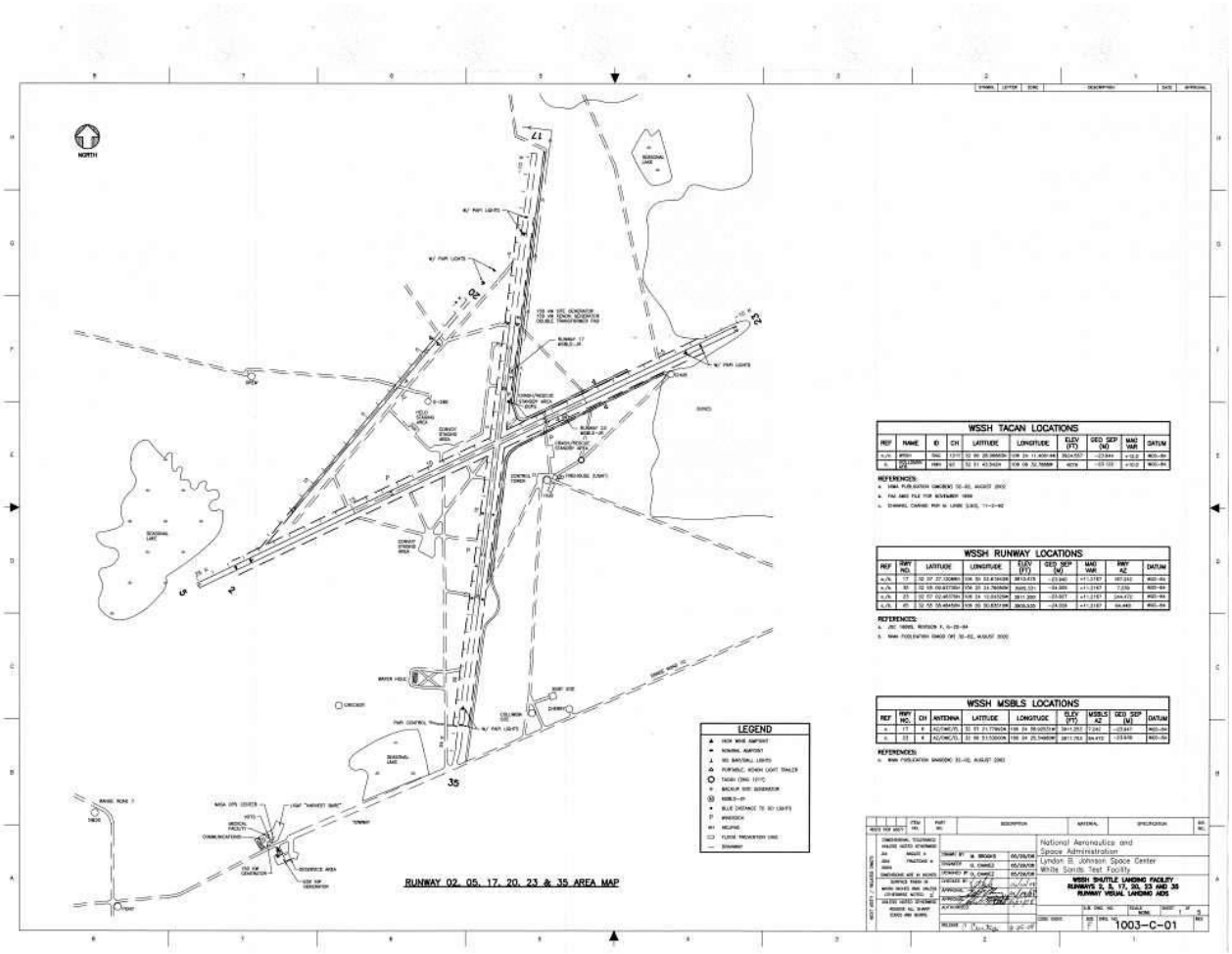

Figure 3. Map of WSSH showing location of all three of the Runways, with latitude and longitude, 2008 (Source: NASA WSTF).

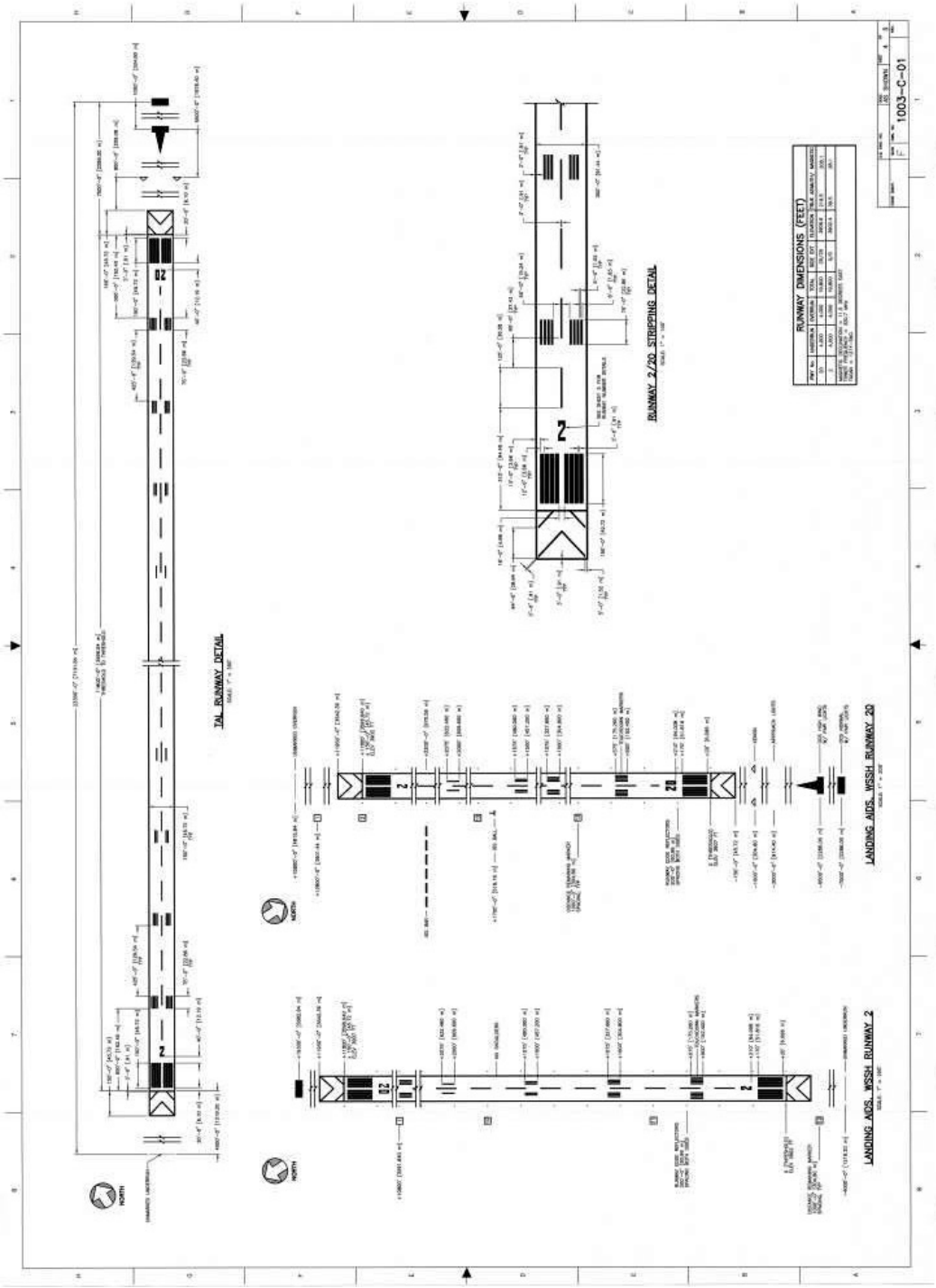

Figure 4. Engineering Plan Sheet and Landing Aid Markings, Runway 20/02, ca.1988 (Source: NASA WSTF).

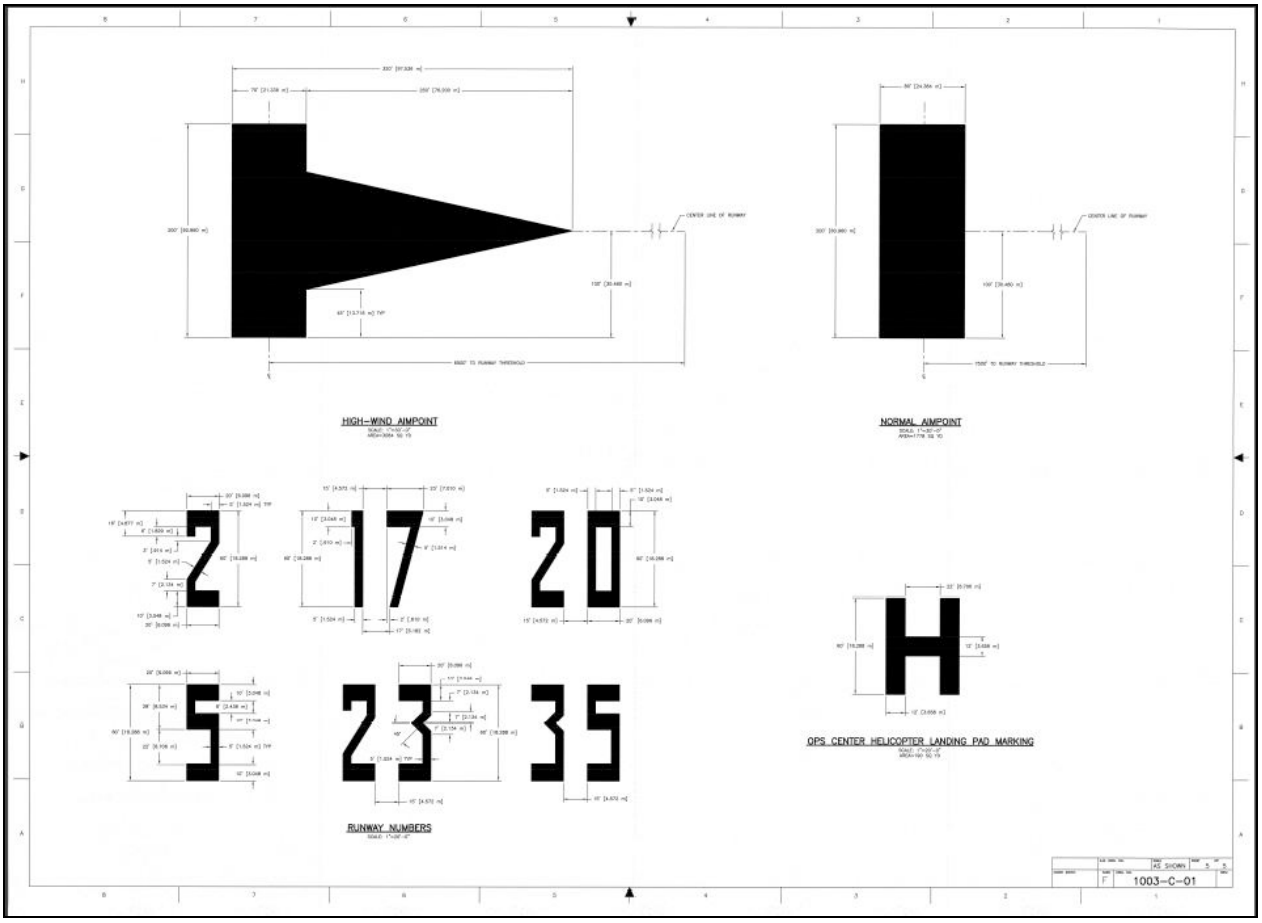

Figure 5. Drawing of Runway Landing Aids Markings, ca.1988 (Source: NASA WSTF).

Figure 6. Aerial view of Runway 20/02, looking Northwest towards the San Andres Mountain Range, undated (Source: NASA WSTF).

Figure 7. Aerial view of Runway 20/02, looking North towards the Sacramento Mountains, 2006 (Source: NASA WSTF).

Figure 8. Aerial view of Runway 20/02, looking West towards the San Andres Mountain Range, 2007 (Source: NASA WSTF).

Figure 9. Aerial view of Runway 17/35 (Foreground) and Runway 20/02 (Background), looking Southwest towards the San Andres Mountains, 2006 (Source: NASA WSTF).

HISTORIC AMERICAN ENGINEERING RECORD

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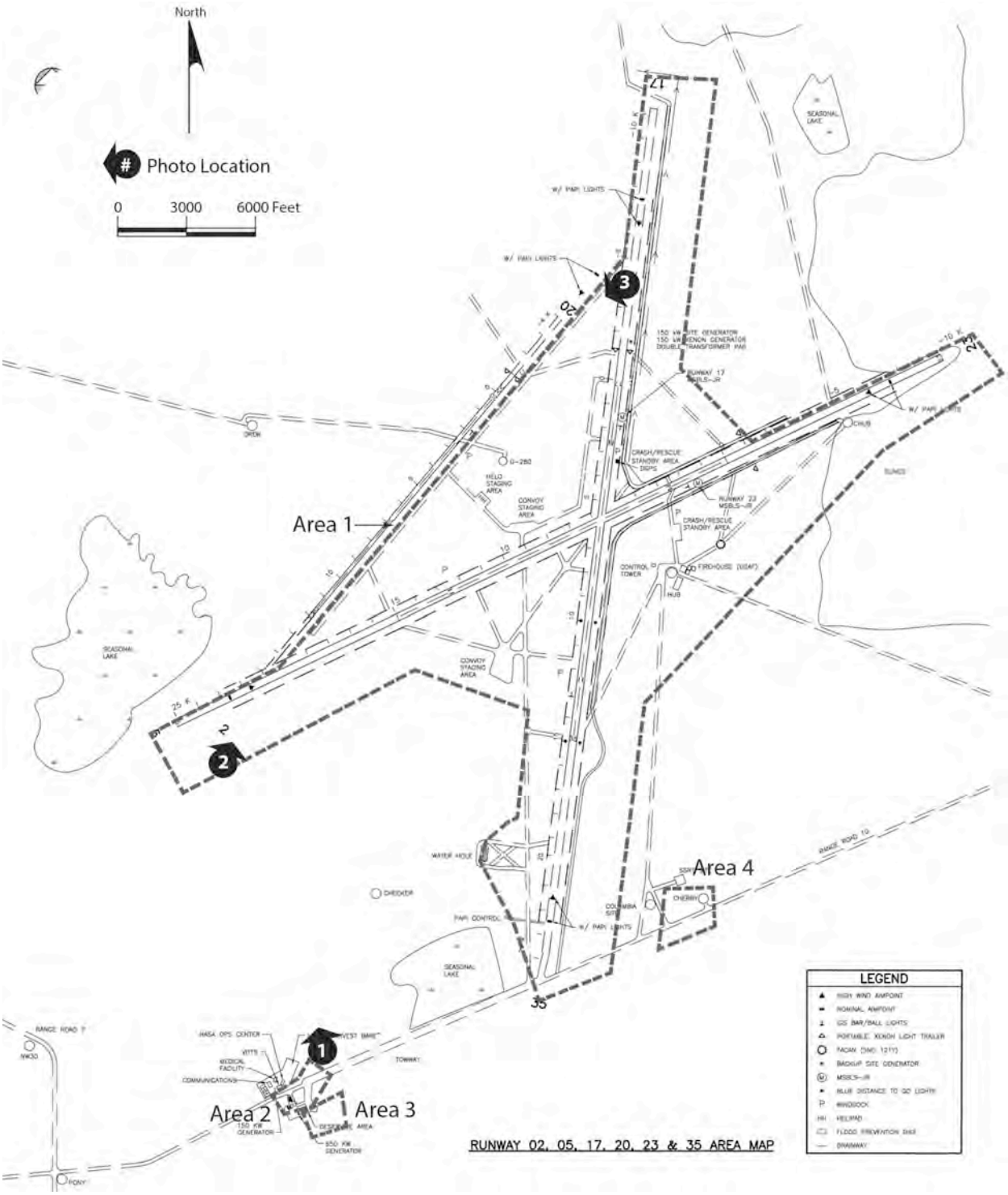
Doña Ana County
New Mexico

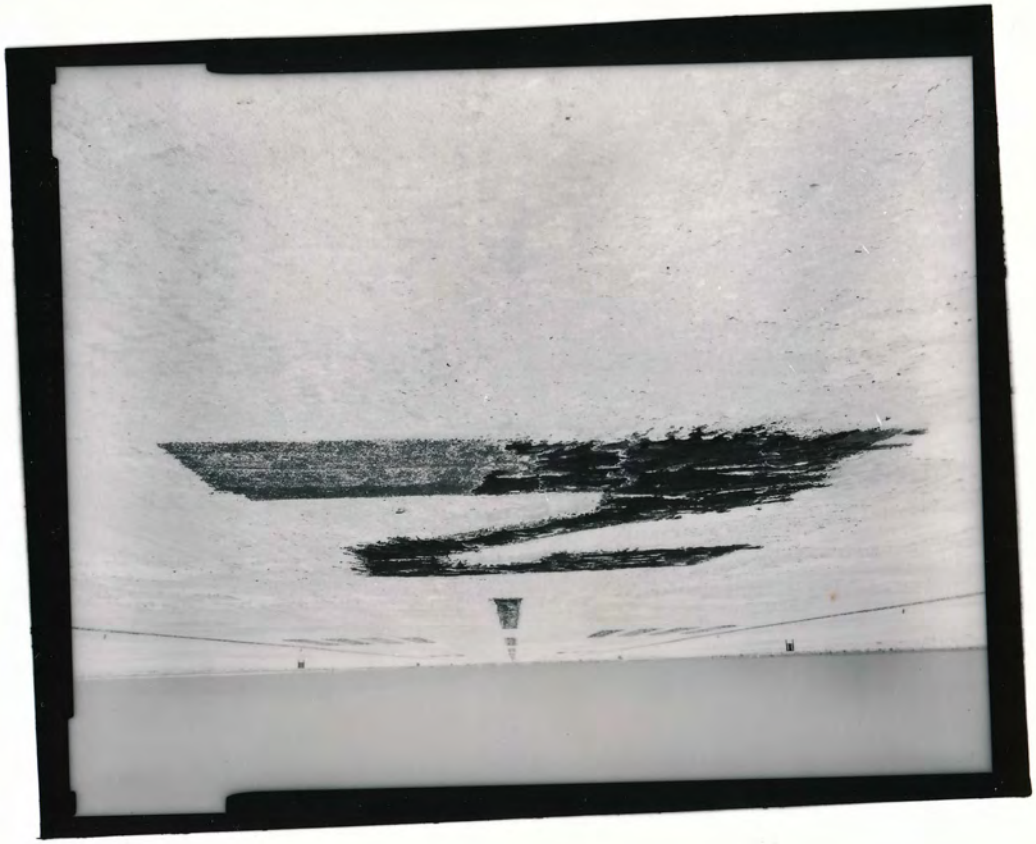
David Diener, Photographer March 27-29, 2012

NM-28-C-1 CONTEXT VIEW OF RUNWAYS LOOKING NORTHWEST TOWARDS SAN ANDRES MOUNTAINS FROM OPERATIONS CONTROL CENTER (AREA 3).

NM-28-C-2 VIEW OF RUNWAY 20/02 LOOKING NORTHEAST FROM SOUTH END WITH ASPHALT "2" MARKING IN FOREGROUND.

NM-28-C-3 VIEW OF RUNWAY 20/02 LOOKING SOUTHWEST FROM NORTH END WITH ASPHALT "20" MARKING IN FOREGROUND AND SAN ANDRES MOUNTAINS IN BACKGROUND.


North
Photo Location
0
3000
6000 Feet
Area 1
Area 2
Area 3
Area 4
RUNWAY 02, 05, 17, 20, 23 & 35 AREA MAP
LEGEND



Kodak 100 TMX