

**THEMATIC SURVEY OF
OKLAHOMA'S WORLD WAR II TRAINING FIELDS, 1941-1945**

Project No. 16-401

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I. ABSTRACT

This report documents the purpose, design, operation, and results of a thematic survey of historic resources associated with Oklahoma's World War II Army Air Training Fields constructed between 1941 and 1945. The survey establishes an inventory of historic resources at non-federally-administered sites associated with Oklahoma's role in training U.S. Army and British aviators and aviation-oriented personnel during the war.

The survey was conducted between October 2016 and June 2017. Fieldwork involved visiting 13 World War II-era airfields across the state and identifying and recording historical architectural resources dating to the 1941-1945 study period. A total of 47 resources were recorded and evaluated for their historical and architectural significance to Oklahoma's role in World War II. Of the 47 resources documented at the minimal level, eight (8) were found National Register-eligible. This survey identifies the training field sites by their historic names, although some are now known by different names.

II. INTRODUCTION

An important part of the OK/SHPO's mission is to oversee and initiate a long term, comprehensive cultural resource survey and inventory program. Since the SHPO is responsible for cultural resources data management and distribution of information regarding the state's preservation program, it subcontracts with other agencies to carry out the time-consuming task of data collection. The data collection process involves three types of systematic surveys.

Among these is the thematic survey, which provides a general assessment of the extent, condition, and types of themed cultural resources across much or all of the state. Thematic surveys allow preservation planners to identify properties that are National Register eligible. Historic architectural resources identified by thematic surveys are recorded at a minimal level of documentation through photography and completion of a standardized information form. The main products of the survey include archival records and a collection of information in the form of a report to assist future preservation efforts.

This report summarizes information from a thematic survey of World War II training airfields created and/or used by the U.S. Army Air Corps/Forces in Oklahoma between 1941 and 1945. The purpose of the survey is to locate, identify, and document airfields for nomination to the National Register of Historic Places and to develop a context in which to evaluate the resources.

Specifically, the project examined 13 airfield sites where World War II airfield-related historic resources may survive. The researchers developed an annotated bibliography of references and a historical context on the topic titled "Oklahoma's WWII

U.S. Army Air Corps Training Airfields, 1941-1945,” based on archival and published sources and the survey results.

Evaluation of airfields followed standards and guidelines set forth in the Secretary of the Interior’s Standards and Guidelines for Identification and Evaluation and the Oklahoma State Historic Preservation Office’s Architectural/Historic Resource Survey: A Field Guide (2013). This survey identifies the training field sites by their historic names, although some are now known by different names.

The project added 47 new resource files to the Oklahoma Landmarks Inventory (OLI). Expanding the OLI’s coverage of historic properties is a goal of the Oklahoma Comprehensive Survey Program and assists the Section 106 review process set forth by the National Historic Preservation Act of 1966.

This survey was funded by the National Park Service Historic Preservation Fund. Funding was administered by the Oklahoma State Historic Preservation Office (SHPO), which contracted with principal investigator (PI) Brad Bays and co-PI Thomas Wikle of Oklahoma State University, to carry out a statewide thematic survey of aviation-related historic resources associated with World War II Army Air Corps training sites active between 1941 and 1945. Project guidance and oversight was provided by Stephanie Ballard and Lynda Ozan.

III. RESEARCH DESIGN

This thematic survey project followed a standard methodology established for thematic surveys of historic/architectural resources as directed by the OK/SHPO and augmented by the experience of the principal investigators. The project involved several phases, some of which occurred simultaneously. Item by item, and in roughly chronological order, these included:

- (1) examination of existing survey materials and contexts relevant to the survey area;
- (2) examination of the Chronicles of Oklahoma, various types of local histories (particularly county histories), pertinent unpublished holdings of the Oklahoma History Center and libraries of the University of Oklahoma and Oklahoma State University, as well as holdings of local historical societies at or near the study sites;
- (3) identifying and notifying interested parties at study sites about the survey so as to better facilitate information collection and provide information about the purpose and objectives of the survey;
- (4) identification of related properties in the study area already listed on the Oklahoma Landmarks Inventory (OLI) and/ the National Register;
- (5) use of aerial photography, including traditional high-resolution orthophotographs to identify locations of resources ahead of site visits;

- (6) site visits to inspect extant resources at a minimal level of documentation, to make additional contacts, and learn specifics from local informants;
- (7) conduct minimal-level documentation of resources, including photographs, GPS positions, and information required for the Historic Preservation Resource Identification Form;
- (8) writing of an historic context specific to the project.

IV. PROJECT OBJECTIVES

This thematic survey of Oklahoma's World War II Army Air Training Fields was intended to identify and inventory the extant historic resources (buildings, structures, districts), and to characterize the types of historic resources (hangars, classrooms, barracks, beacons, etc.) associated with training military aircraft-related personnel (pilots, navigators, radar technicians, mechanics, etc.) in Oklahoma between 1941 and 1945. The study sites that are the focus of this survey include both active municipal airports, as well as abandoned sites, which were identified by Thomas A. Wikle of Oklahoma State University in his research on Oklahoma's World War II Army Air Corps training facilities. Prior to this survey, no systematic inventory of extant historic resources had been conducted at these locations, and no set of sources needed to conduct further research had been compiled.

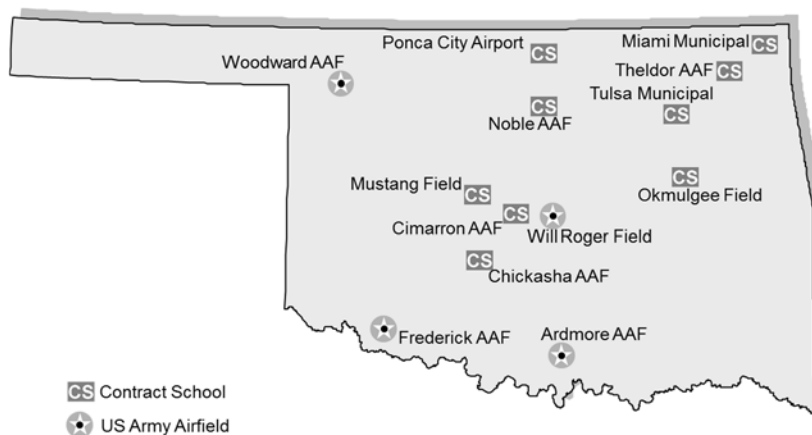
The project was designed to develop an archive of extant historical architectural resources relating to Oklahoma's World War II Air Training Fields for the Oklahoma Landmarks Inventory (OLI) as well as this report, which is intended to be used as a cultural resources management planning tool.

The study and this report had three main objectives: (a) to identify individual resources and potential districts within the designated study areas that, on the basis of their design and integrity, may be eligible for National Register listing, to identify their levels of significance (local, regional, or national), and to substantiate assessments of significance by applying the National Register Criteria for Evaluation; (b) to record, at a minimal level of documentation, all individual properties constructed during the 1941-1945 study period located within the designated study sites; and (c) to identify and

annotate all reference materials useful for completing National Register nominations and/or conducting additional research on historic resources found eligible for National Register listing.

V. AREA SURVEYED

This contract directed the research team to conduct site visits to 13 airfields around the state identified as no longer containing a direct federal agency presence on the site. Certainly, more than 13 airfields in Oklahoma during World War II contributed to training efforts for the U.S. Army Air Corps/Air Forces, but historic preservation planning efforts on military and other U.S. government properties are the concern of the relevant service branch or federal agency in charge of such sites. Examples include Tinker Air Force Base in Midwest City and Oklahoma City's Will Rogers World Airport, where the Federal Aviation Agency (FAA) has authority. The survey examined sites created and operated directly by the U.S. Army Air Corps/Forces and private flight schools under contract with the U.S. Army.



Study Sites

The survey of Oklahoma's World War II Air Training Fields included both those created and operated directly by the U.S. Army Air Corps/Forces as well as contract flight school operators.

The sites identified for this thematic survey included municipal general aviation and commercial airports and private properties under the authority of the State of Oklahoma. This survey identifies the training field sites by their historic names, although some are now known by different names:

Ardmore Army Airfield, Ardmore, Carter County

Chickasha Field, Chickasha, Grady County

Cimarron Army Airfield, Oklahoma City, Canadian County

Frederick Army Airfield, Frederick, Tillman County

Miami Municipal Airport, Miami, Ottawa County

Mustang Field, El Reno, Canadian County

Noble Army Airfield, Perry, Noble County

Okmulgee Field, Okmulgee, Okmulgee County

Ponca City Airport, Ponca City, Kay County

Tulsa Municipal Airport, Tulsa, Tulsa County

Theldor Army Airfield, Vinita, Craig County

Will Rogers Field, Oklahoma City, Oklahoma County

Woodward Army Airfield, Woodward, Woodward County

VI. METHODOLOGY

The project followed a standard methodology established for thematic surveys of historic/architectural resources as directed by the OK/SHPO and augmented by the experience and technical expertise of the principal investigators. The project involved several phases, some of which occurred simultaneously, including:

- (1) examination of existing OK/SHPO survey materials and historic contexts relevant to the survey sites;
- (2) examination of *The Chronicles of Oklahoma* and *The Encyclopedia of Oklahoma History and Culture*, various local histories, pertinent unpublished holdings, online archives of *The Daily Oklahoman*, as well as holdings of local aviation museums (typically on-site), which were relevant to the development of the historic context;
- (3) contacting authorities at study sites and requesting and scheduling site visits, all of which were guided, and communicating with local people at the study sites who have interests in preserving historical architectural resources associated with World War II training airfields, of which there are many;
- (4) identification of properties in the study area listed on the Oklahoma Landmarks Inventory and properties listed on both the OLI and the National Register so as to discern OLI properties that may be eligible for nomination to the National Register;

(5) use of aerial photography, including traditional high-resolution orthophotographs (vertical-perspective) and, where available, low-elevation oblique perspective aerial photography to identify resource locations prior to actual site visits;

(6) field inspection of sites and recording, at a minimal-level of documentation, all extant individual resources;

(7) completion of one Historic Preservation Resource Identification Form and elevation photographs of each resource;

Kinds of Properties Sought

This thematic survey specifically sought to collect information on buildings and structures associated with Oklahoma's World War II Training Airfields. The period of study was 1941-45, and the range of resources came from two classes of training airfields: (a) those built from scratch and operated by the U.S. Army Air Corps/Forces in the wake of the Japanese bombing of Pearl Harbor, and (b) those built and operated by private firms with whom the Army contracted for training and related services.

Following initial research, anticipated resources included various types of military-related buildings and structures in the form of aircraft hangars, barracks, aircraft service facilities, beacon towers, and runway/taxiway alignments. The primary resource type sought was the aircraft hangar, as it was known that many are still in use.

Intensity of Coverage

All 13 sites listed in the contract were visited and inspected at least once during the Fall of 2016. Review of digital photos and mapping of recorded resources followed. Upon completion of fieldwork, data were entered into a Microsoft Access database for uploading to the Oklahoma Landmarks Inventory database and printing hardcopies of the OK/SHPO Historic Preservation Resource Identification Form for filing at the OK/SHPO. The final forms and 4x6 prints were placed in file folders and organized by address. Maps were prepared of study sites that included locations of recorded resources. The final report draft and photographs were shared with architectural consultant Charles Leider for his written assessment.

VII. RESULTS

A total of 47 individual resources were recorded at the minimal level of documentation at 11 of the 13 study sites. Eight individual resources, all of which are buildings, were identified as National Register eligible. Of these buildings, five are aircraft hangars. Thumbnail sketches of each resource and justifications are provided later in this report.

Two of the 13 study sites were eliminated from the original list. Field inspection determined that all extant World War II-era air training resources at Will Rogers World Airport were currently located on FAA property. Field inspection at the Theldor Field site revealed that no material trace of World War II training activity survives; the site is now an agricultural field located on private land. Ardmore Army Airfield contained the largest collection of extant World War II-era resources. Six of the original 13 sites contained one or more National Register-eligible resources.

Survey Site	Recorded Resources
Ardmore Army Airfield, Ardmore	14
Chickasha Field, Chickasha	3
Cimarron Army Airfield, Oklahoma City	3
Frederick Army Airfield, Frederick	2
Miami Municipal Airport, Miami	4
Mustang Field, El Reno	7
Noble Army Airfield, Perry	1
Okmulgee Field, Okmulgee	2
Ponca City Airport, Ponca City	5
Tulsa Municipal Airport, Tulsa	3
Theldor Army Airfield, Vinita	0
Will Rogers Field, Oklahoma City	0
Woodward Army Airfield, Woodward	3

VIII. HISTORIC FUNCTION TYPES OF RECORDED RESOURCES

This section inventories the function types of the 47 resources recorded in this survey.

The organization and category conventions used here conform to those listed in the

OK/SHPO's *Architectural/Historic Resource Survey: A Field Guide* (updated 2013),

available at: <http://www.okhistory.org/shpo/architsurveys/fieldguide.pdf>. Information

for each resource was obtained through various sources, including historic photos, maps,

published histories, and personal communication. The total resources recorded in the

survey is indicated in parentheses.

Resource Types Surveyed:

Buildings (41)

Structures (5)

Objects (1)

Historic Function Types

Some 45 recorded resources were categorized into five (5) of the general historic function

classes (all-caps) and six different specific historic function types defined by the

OK/SHPO. More than three-quarters of all recorded resources were air-related. Function

types of two resources were either unidentified or did not fit any function type.

GOVERNMENT: Fire Station (1)

RECREATION: Recreation (1), Theater (1)

INDUSTRY/PROCESSING EXTRACTION: Communication Facility (1)

DEFENSE: Arms Storage (5)

TRANSPORTATION: Air-Related (36)

UNKNOWN (1)

OTHER (1)

Current Function Types

It should be noted that many of the historical functions of resources identified as air-related have current functions that are very different. For example, some historically air-related buildings are now in use as manufacturing facilities (Ponca City), college instruction facilities (Spartan School of Aeronautics in Tulsa), and even correctional facilities (Ardmore).

IX. ARCHITECTURAL STYLES SURVEYED

Architectural styles were not irrelevant to this study of World War II-era airfields. While most of the buildings surveyed conformed to a strictly functional appearance associated with military pragmatism, a few exceptional resources exhibited strong architectural style features.

While it would seem frivolous to adorned aircraft hangars with architectural styling during wartime mobilization, it had a reasonable explanation. They were constructed by local builders under federal contract, and the contracts provided for facilities to be conveyed to municipalities for general aviation use after the war concluded. They were excellent examples of how wartime mobilization produced civilian infrastructure.

The two styles observed includes a form of the Commercial style that might be referred to as Military/Utilitarian, and Art Deco. Some examples of the former have been maintained exactly as they appeared in 1944 (i.e., Chickasha), while others have been modified for use in more recent times (i.e., Cimarron, Mustang). The two Art Deco resources are the hangars at Okmulgee and Ponca City.



Military/Utilitarian

There is no common definition of a specific style of military-related buildings from the Second World War. In general, hangars were built as efficiently as possible and received only a skin of corrugated sheet iron. Site visits demonstrated that much the original material is still in use, although it may have received several coats of paint over the years.



Art Deco, 1920-1940

Virginia Savage McAlester (2015) identifies the Art Deco style as containing smooth wall surfaces that typically are stucco-clad, with stylized motifs and decorative detailing that emphasizes verticality. It was a style used primarily on commercial and public buildings prior to World War II.

X. LIST OF INDIVIDUAL RESOURCES RECORDED

Two-digit reference numbers at left correspond to OK/SHPO street address-based file folder ordering convention. Resource #01 is the first file folder in the box.

- #01 TULSA MUNICIPAL AIRPORT BUILDING NO. 10 ENGINE
OVERHAUL
7304 EAST APACHE STREET
National Register Eligible (Criterion A)
Period of Significance: 1942-1945
- #02 TULSA MUNICIPAL AIRPORT BUILDING NO. 11 CUSTOMER
ENGINE STORAGE
7304 EAST APACHE STREET
- #03 TULSA MUNICIPAL AIRPORT BUILDING NO. 8 AIRCRAFT
OVERHAUL
7304 EAST APACHE STREET
- #04 ARDMORE ARMY AIR BASE COMMUNICATIONS BUILDING
711 GENERAL STREET
National Register Eligible (Criterion A)
Period of Significance: 1942-1945
- #05 ARDMORE ARMY AIR BASE ELECTRICAL CONTROL BUILDING
711 GENERAL STREET
- #06 ARDMORE ARMY AIR BASE FIRE STATION
711 GENERAL STREET
- #07 ARDMORE ARMY AIR BASE GYMNASIUM
711 GENERAL STREET
- #08 ARDMORE ARMY AIR BASE MUNITIONS STORAGE UNIT NO. 1
711 GENERAL STREET
- #09 ARDMORE ARMY AIR BASE MUNITIONS STORAGE UNIT NO. 2
711 GENERAL STREET
- #10 ARDMORE ARMY AIR BASE MUNITIONS STORAGE UNIT NO. 3
711 GENERAL STREET
- #11 ARDMORE ARMY AIR BASE MUNITIONS STORAGE UNIT NO. 4
711 GENERAL STREET

- #12 ARDMORE ARMY AIR BASE MUNITIONS STORAGE UNIT NO. 5
711 GENERAL STREET
- #13 ARDMORE ARMY AIR BASE PARACHUTE RIGGING AND
STORAGE BUILDING
711 GENERAL STREET
- #14 ARDMORE ARMY AIR BASE SIMULATOR BUILDING
FOUNDATION
711 GENERAL STREET
- #15 ARDMORE ARMY AIR BASE SMALL UNIDENTIFIED BUILDING
711 GENERAL STREET
- #16 ARDMORE ARMY AIR BASE SOUTH MAINTENANCE HANGAR
711 GENERAL STREET
- #17 ARDMORE ARMY AIR BASE THEATER RUINS
711 GENERAL STREET
- #18 PONCA CITY AIRPORT BRICK HANGAR
2231 WAVERLY STREET
National Register Eligible (Criterion A)
Period of Significance: 1942-1945
- #19 NOBLE ARMY AIRFIELD RUNWAY
15500 COUNTY ROAD 110
- #20 WOODWARD ARMY AIRFIELD T-100 WATER TOWER
196077 EAST COUNTY ROAD 40
- #21 WOODWARD ARMY AIRFIELD T-30 HANGAR
196077 EAST COUNTY ROAD 40
- #22 WOODWARD ARMY AIRFIELD WAREHOUSE FOUNDATION
196077 EAST COUNTY ROAD 40
- #23 OKMULGEE FIELD BEACON
100 WEST AIRPORT ROAD
- #24 OKMULGEE FIELD MAIN HANGAR
100 WEST AIRPORT ROAD
National Register Eligible
Period of Significance: 1942-1945

- #25 CHICKASHA FIELD BEACON
2344 BEEHCRAFT ROAD

- #26 CHICKASHA FIELD HANGAR NO. 3
2344 BEEHCRAFT ROAD
National Register Eligible
Period of Significance: 1942-1945

- #27 CHICKASHA FIELD HANGAR NO. 4
2344 BEEHCRAFT ROAD
National Register Eligible
Period of Significance: 1942-1945

- #28 CIMARRON ARMY AIRFIELD HANGAR NO. 2 FOUNDATION
2300 NORTH CIMARRON ROAD

- #29 CIMARRON ARMY AIRFIELD HANGAR NO. 3
2300 NORTH CIMARRON ROAD

- #30 CIMARRON ARMY AIRFIELD HANGAR NO. 4
2300 NORTH CIMARRON ROAD

- #31 PONCA CITY AIRPORT BUILDING FOUNDATION
3 WEST DARR INDUSTRIAL PARK ROAD

- #32 PONCA CITY AIRPORT CENTER HANGAR
3 WEST DARR INDUSTRIAL PARK ROAD

- #33 PONCA CITY AIRPORT EAST HANGAR
3 WEST DARR INDUSTRIAL PARK ROAD

- #34 PONCA CITY AIRPORT WEST HANGAR
3 WEST DARR INDUSTRIAL PARK ROAD

- #35 FREDERICK ARMY AIRFIELD BUILDING NO. 75 BASE
ENGINEERING MAINTENANCE AND INSPECTION
1801 FLYING FORTRESS ROAD

- #36 FREDERICK ARMY AIRFIELD BUILDING NO. 78 BASE
ENGINEERING SHOP
1801 FLYING FORTRESS ROAD
National Register Eligible
Period of Significance: 1942-1945

- #37 MUSTANG FIELD BEACON
6600 SOUTH MUSTANG FIELD ROAD

- #38 MUSTANG FIELD BUILDING FOUNDATION
6600 SOUTH MUSTANG FIELD ROAD
- #39 MUSTANG FIELD HANGAR NO. 1
6600 SOUTH MUSTANG FIELD ROAD
- #40 MUSTANG FIELD HANGAR NO. 2
6600 SOUTH MUSTANG FIELD ROAD
- #41 MUSTANG FIELD HANGAR NO. 3
6600 SOUTH MUSTANG FIELD ROAD
- #42 MUSTANG FIELD HANGAR NO. 4
6600 SOUTH MUSTANG FIELD ROAD
- #43 MUSTANG FIELD STAR
6600 SOUTH MUSTANG FIELD ROAD
- #44 MIAMI MUNICIPAL AIRPORT LINK TRAINER BUILDING
2600 REX PLOTT ROAD
- #45 MIAMI MUNICIPAL AIRPORT MAINTENANCE HANGAR
2600 REX PLOTT ROAD
- #46 MIAMI MUNICIPAL AIRPORT NORTHEAST HANGAR
2600 REX PLOTT ROAD
- #47 MIAMI MUNICIPAL AIRPORT WEST HANGAR
2600 REX PLOTT ROAD
National Register Eligible
Period of Significance: 1942-1945

XI. THUMBNAIL SKETCHES OF INDIVIDUAL RESOURCES IDENTIFIED AS NATIONAL REGISTER ELIGIBLE

The National Register Criteria for Evaluation allow resources to be assessed for their eligibility for National Register listing. Evaluation of the 47 resources identified eight that possessed features and/or associations that make them eligible for listing.



- #01 TULSA MUNICIPAL AIRPORT BUILDING NO. 10 ENGINE OVERHAUL
7304 EAST APACHE STREET
National Register eligible (Criterion A, local significance)
Period of Significance: 1942-1945

This 43,500 square-foot building contains brick wall-cladding and has a round roof. Windows remain in good condition. The building has not experienced much alteration and remains in use for instruction of aircraft engine repair and overhaul.



#04 ARDMORE ARMY AIR BASE COMMUNICATIONS BUILDING
711 GENERAL STREET
National Register eligible (Criterion A, local significance)
Period of Significance: 1942-1945

This 4,100 square-foot T-shaped communications building is constructed of terra cotta loadbearing tile, which was a common building material at the Ardmore facility. The building has a flat roof with narrow eaves. The wing illustrated here serves as a garage and features segmented overhead doors. Most windows have been obscured or contain air-conditioning units.



#18 PONCA CITY AIRPORT BRICK HANGAR
2231 WAVERLY STREET
National Register eligible (Criterion A, local significance)
Period of Significance: 1942-1945

This 13,000 square-foot Art Deco style brick and steel hangar has a flat roof. The hangar form includes four towers, each composed of four corners of brick veneer with vertical-emphasis brickwork. An office area is located on the east elevation (opposite). The hangar's original sliding doors on the north and south elevations have been replaced with modern swing-panel doors, but otherwise the hangar retains its original appearance. The west elevation, shown here, contains most of the original windows. The hangar remains in regular use for general aviation aircraft repair and storage. According to sources on the site, for many years this hangar stored the luggage and supplies recovered from the wreckage of the Wiley Post and Will Rogers airplane crash in Alaska in the mid-1930s.



- #24 OKMULGEE FIELD MAIN HANGAR
100 WEST AIRPORT ROAD
National Register eligible (Criterion A, local significance)
Period of Significance: 1942-1945

This 15,700 square-foot aircraft hangar is clad in stucco, brick, stone, and steel. It has a closed-arch roof and original multi-leaved hanging doors.

Windows remain in excellent condition for their age. An airport office occupies the taxiway side of the hangar.

This resource is in pristine condition and has no identifiable loss of integrity that would disqualify it from National Register listing. It remains in regular use for general aviation aircraft repair and storage at Okmulgee Municipal Airport.



- #26 CHICKASHA FIELD HANGAR NO. 3
2344 BEECHCRAFT ROAD
National Register eligible (Criterion A, local significance)
Period of Significance: 1942-1945

This 25,000 square-foot aircraft hangar is composed of two parallel steel closed-arched roofs connected by a centered gabled roof. Wall-cladding is the original corrugated sheet iron, maintained with zinc-rich paint to retain its original appearance. Windows contain 15 panes with a moveable center awning portion, a common design seen on other World War II hangars. The south gable-end (shown) contains a shed-roof extension. The hangar has a concrete foundation. Access is provided by original multi-leaved (segmented) doors on the north elevation with 10-pane windows.

This resource is in pristine condition and has no identifiable loss of integrity that would disqualify it from National Register listing. It remains in regular use for general aviation aircraft repair and storage at Chickasha Municipal Airport.



#27 CHICKASHA FIELD HANGAR NO. 4
2344 BEEHCRAFT ROAD
National Register eligible (Criterion A, local significance)
Period of Significance: 1942-1945

This 20,000 square-foot aircraft hangar has a steel closed-arched roof. Wall-cladding is the original corrugated sheet iron, maintained with zinc-rich paint to retain its original appearance. A clerestory of 10-pane windows is located above eave-side shed extensions on the east and west elevations. The hangar has a concrete foundation. Access is provided by original multi-leaved (segmented) doors on the north and south elevations that contain eight-pane windows and a pilot's door.

This resource is in pristine condition and has no identifiable loss of integrity that would disqualify it from National Register listing. It remains in heavy use for general aviation aircraft repair and storage at Chickasha Municipal Airport.



#36 FREDERICK ARMY AIRFIELD BUILDING NO. 78 BASE
ENGINEERING SHOP
1801 FLYING FORTRESS ROAD
National Register eligible (Criterion A, local significance)
Period of Significance: 1942-1945

This 33,000 square-foot hangar has a concrete slab foundation, a wood and steel closed-arched roof, and weatherboard wall-cladding. Two-story shed-roofed extensions adjoin the eave sides on the northeast and southwest elevations. There are exterior chimneys on the southeast and northwest corners. Access is provided by an original pilot's door and a 10-door, multi-leaved (segmented) entry on the northwest and southeast elevations. Doors contain tall 24-pane (8x4) windows, the top panes of which have been obscured by paint (shown). Additional entries are located near the building's center on the southwest and northeast sides.

This resource is in excellent condition and has no identifiable loss of integrity that would disqualify it from National Register listing. It is maintained and used as headquarters and as an aircraft facility by the Frederick World War II Airborne Demonstration Team Foundation.



- #47 MIAMI MUNICIPAL AIRPORT WEST HANGAR
2600 REX PLOTT ROAD
National Register eligible (Criterion A, local significance)
Period of Significance: 1942-1945

This 13,000 square-foot hangar has a steel closed-arched roof. The hangar has a concrete slab foundation. Walls are clad with original corrugated sheet iron. The south elevation contains an eave-side shed-roof extension. Both north and south eave-sides have fenestrations of 30-pane (6x5) windows with moveable center awning portions, similar to other World War II-era hangars. Access is provided by a six-door, multi-leaved (segmented) entry on the west elevation. Doors contain 12-pane (3x4) windows, some of which have been obscured by yellow paint (shown).

This resource is in fair condition, but has no identifiable loss of integrity that would disqualify it from National Register listing. It remains in use by general aviation aircraft at Miami Municipal Airport.

XII. HISTORIC CONTEXT FOR OKLAHOMA’S WORLD WAR II U.S. ARMY AIR CORPS TRAINING AIRFIELDS, 1941-1945

Introduction

During the early years of the First World War, military aircraft were used mostly for reconnaissance, but by the time the United States entered the Great War in 1917, aircraft were being used as fighters, bombers, and in ground attack roles. At that point, the United States had fewer than 100 pilots and only three training airfields. Several new airfields were added in 1918 and more than 11,000 officers completed primary flight training by the November Armistice. Nevertheless, the U.S. Armed Forces initiated an immediate draw-down after the war. Peacetime military budgets fell anemic during the Roaring Twenties, then withered on the vine during the Great Depression. A decade and a half after the Great War, the U.S. Armed Forces were severely underfunded; equipment and training were so antiquated that in 1937 the Army Air Corps consisted of 187 pilots at Randolph Army Airfield, near San Antonio, Texas.

That year, the global economy began to recover in the wake of rising German and British military spending. Imperial Japan controlled the puppet state of Manchukuo and Hitler was amassing the world's most sophisticated war machine. The United States military, by comparison, was in desperate need of a military: it needed soldiers, sailors, airmen, as well as trucks, tanks, ships, and aircraft.

More specifically, the Army Air Corps was short combat and transport pilots, as well as both primary flight training facilities and specialized facilities for training gunners, navigators, and bombardiers. At the same time, the arrival of newer types of

aircraft led to changes in airfield design. Sod runways, though suitable for 1,000-pound bicycle-tired taildraggers from 1918, were wholly inadequate for round-the-clock takeoffs and landings by four-ton fighter planes and 40-ton bombers.

In 1939 President Franklin Roosevelt called for \$300 million to be invested in the purchase of aircraft and the expansion of Air Corps facilities, including an initial training objective of 7,000 new pilots per year. That in itself would have required building at least several new training facilities, but with the attack on Pearl Harbor and America's entry into the war, the prewar goal became a wartime demand for an astounding 102,000 new pilots annually. Training that many pilots that quickly demanded the construction of dozens, if not hundreds, of new training facilities.

To address the immediate need for new facilities, the Army assigned a team of officers the responsibility of identifying potential sites for training airfields, auxiliary airstrips, and practice areas for gunnery and bombing runs. These sites needed to be far from civilian air traffic on land that was relatively level, well-drained, free of obstructions, and easy to prepare.

Early in 1942 the Army ordered the construction of 200 new Air Corps training projects, including airfields, bombing ranges, gunnery ranges, and pilot and technical schools. By spring it doubled the order to 400 projects; by summer of 1942 it had again doubled the order to 800 new projects.

With its level terrain, sunny skies, and safety from seaborne attacks, Oklahoma was well-suited to receive some of the new facilities. Moreover, Oklahomans--having endured a protracted farm crisis, the Great Depression and a Dust Bowl--cheered the prospect of military construction projects and the jobs and business activity they would

generate. Civic leaders in Ardmore, Enid, and Oklahoma City led the way by identifying optimal locations for new airfields and using their political ties to get the attention of top brass in the Army.

Army Airfields

The U.S. Army Corps of Engineers (USACE) was responsible for overseeing new site preparation and the construction of essentially all buildings and structures associated with new Air Corps training facilities. Perhaps the most significant properties associated with Oklahoma's WWII Army training airfields are their poured concrete structures: the runways, taxiways, and aprons for parking aircraft. Construction of a typical airfield required about 1,000 workers, including hundreds of local laborers as well as smaller numbers of skilled workers. A distinctive triangular runway layout was adopted at many airfields to accommodate tail-wheel aircraft that had difficulty operating in strong crosswinds. Taxiways were laid out parallel to runways and built with reinforced concrete to handle the stress caused by turning larger aircraft. Windsocks were built adjacent to fields and runways, and taxiway lights were installed to support night operations.

In addition to runways, taxiways, and aprons, military airfields required control towers, hangars, munitions storage buildings, and cantonment areas with barracks for officers and enlisted personnel, commissaries, supply buildings, administrative offices, and fire stations. There were also training and classroom buildings, recreation halls, swimming pools, chapels, post offices, and theaters. Most buildings followed a standard layout so as to facilitate rapid construction, and many were designed for only short-term

use. For example, many support buildings were often made of simple frame construction with plywood wall cladding, gabled roofs covered with tarpaper, and open-air electrical wiring. Buildings designed to accommodate heavy tasks, such as aircraft maintenance, were constructed over slab-on-grade concrete pads.

The largest buildings at any Army Air Corps (renamed Army Air Forces in 1942) training facility were the aircraft hangars. Most hangars were constructed with cinder block walls that supported a huge arched roof supported by steel trusses similar to those used in bridge construction. Other hangar roofs are constructed of laminated lumber, perhaps due to the need for other wartime uses of steel; and appear much heavier than the steel truss variety. Hangar doors usually consisted of a series of 8-12 large, hanging slab doors that could be moved by hand along a track so as to be amassed vertically and open the entire side of the hangar. Single-story shed-roofed additions were built along one or more sides of many hangars so as to accommodate administrative functions, storage, maintenance, and other needs. Some hangars had a brick chimney connected to a boiler to provide heat.

An airfield's buildings and facilities were accessible by a simple grid system of roads. The tallest structures at each airfield usually included a control tower, a water tank, and a red and white tower that supported the airfield's rotating beacon. Planned and built as self-contained towns, Army training airfields were usually completed within 18 months. By 1943, the Army Air Forces (AAF) had charge of 783 airfields in the continental United States, including smaller subbases and auxiliary airstrips.

New AAF facilities helped transform nearby communities. For example, before the war, Frederick was a quiet, Tillman County cotton farming center. In 1942, with the arrival of its first commander, Col. Robert Davenport, Frederick's AAF facility began taking shape. The provision of labor and materials for base construction stimulated Frederick's economy and employed local civilians with various types of industrial and service skills. Upon completion, an influx of military personnel brought continued demand for local products and services.

The airfield at Frederick was designed with four hard-surfaced runways. Training aircraft were lined-up on a large concrete area known as "the ramp" adjacent to the flight line. Along with training pilots to fly the twin-engine Curtis-Wright AT-9 Jeep, Frederick was also used by Women's Army Service Pilots (WASPs) for flight checks of combat pilots returning from overseas service who had been selected as flight instructors. Flight training at Frederick continued until October 31, 1945.

Along with primary and advanced pilot training, several of Oklahoma's AAF facilities provided highly-specialized combat training to air crews deploying to the European and Pacific theaters, including aerial gunnery, navigation, reconnaissance, and bombing. Woodward Army Airfield trained crews of heavy bombers and pursuit aircraft. Ardmore Army Airfield trained crews for the Martin B-26 Marauder and Boeing B-17 Flying Fortress. Combat aircrews trained at Woodward or Ardmore for three to five months.

Located just west of Enid, Oklahoma's Salt Plains served as a range for Ardmore-based crews to complete simulated bombing missions by dropping ordinance on outlines depicting facilities such as oil refineries. Ordinance at Ardmore Field was stored in brick

buildings located on the opposite side of the airfield from the flight line and cantonment. Ardmore's central location made it a popular stop-over for cross country flights or refueling. Late in the war, the airfield was also used to confine German prisoners of war.

Additionally, Will Rogers Field, in Oklahoma City, hosted pursuit and bomber squadrons as well as specialized training units. Included at Will Rogers Field was the 2nd Photo Reconnaissance Group, which became well-known for its high-resolution aerial photography of the beaches of Normandy just prior to the D-Day invasion.

The Contract Flight Schools

With ambitious goals for producing new pilots, the Army looked for ways to expand its training capacity. In 1939, Army planners took the unusual step of arranging for civilian flight schools to train military pilots. "Contract schools," organized through the Civilian Pilot Training Program (CPTP), were military contractors based at civilian airfields. Most were intentionally located south of the 37th Parallel, where flight conditions were more reliable year-round. A total of 62 contract flying schools operated during the war.

The military and the Civilian Aviation Authority (CAA) required each contract school to demonstrate that it could provide at least one aircraft for every ten student pilots, plus necessary supplies of ancillary materials (parachutes, goggles, textbooks, etc.). Since their aircraft were lighter than those used at AAF facilities, contract schools could use sod airfields without a control tower; in some cases, Congress granted contract schools runway upgrades through the Works Progress Administration (WPA). All CPTP schools received \$1,170 for each primary flight school graduate; nevertheless, the investment in aircraft and facilities remained considerable, so the Army guaranteed that

all CPTP facilities would be used long enough for contractors to amortize their investments.

The army established strict requirements for both instructors and students. Civilians between the ages of 21 and 42 were eligible to serve as CPTP instructors if they completed an eight-week ground school and a flight refresher offered at Wiley Post Airfield near Oklahoma City. Pilot candidates were required to complete nine weeks of training, including 60-65 hours of flight time in a Stearman PT-17 Kaydet or a Fairchild PT-19 trainer, both open cockpit aircraft that could be flown year-around. Each cadet received \$75 per month: \$50 of regular pay, plus \$25 of flight pay. Graduates entered the U.S. Army as enlisted reservists; most went on to receive commissions as second lieutenants and to take additional flight training required to fly combat, ferry, liaison, glider, or transport missions.

In January 1942 the Daily Oklahoman carried the headline "Want an Army Pilot School? Just Build it." Tulsa's Spartan School of Aeronautics was among the first of nine civilian flight schools across the United States selected as a CPTP site. Operating at Tulsa Municipal Airport (now Tulsa International Airport), Spartan's CPTP program trained cadets between August 1, 1939 and August 4, 1944. Spartan's chief pilot was Maxwell Balfour, who had flown with observation squadrons during the First World War.

Three other contract schools operated near Oklahoma City. Founded by Ray Wilson and F.W. Bonfils, the Wilson-Bonfils Flying School operated at Chickasha Field. Between October 4, 1941 and May 1, 1945 Wilson-Bonfils trained more than 8,000 cadets, mostly in PT-19s. At nearby Cimarron Field, partners Clarence Page, John Burke, Jess Sass, and Ted Colbert opened Oklahoma Air College. Construction at Cimarron

Field, which allegedly required filling in some old buffalo wallows, included five sod airstrips, barracks for cadets, a dining hall, and an administrative building. More than 4,000 cadets were trained between April 1, 1941 and June 27, 1944. As student numbers at Cimarron Field began exceeding capacity, construction on Mustang Field was initiated near the town of El Reno. With three turf runways, Mustang was operated by Midwest Air School and Oklahoma Air College.

Oklahoma's British Flying Schools

During 1940-41, as the Battle of Britain raged, U.S. Army General Henry H. "Hap" Arnold arranged for U.S. contract schools to train RAF cadets. Every five weeks, each such British Flying School (BFS) would accept 50 cadets to begin a 20-week training course.

Oklahoma hosted two of the seven BFSs. Having gained experience with its contract school in Tulsa, Spartan operated British Flying Training School #3 in Miami, Oklahoma from November 12, 1942 until September 30, 1945. Another British flying school was established by Harold S. Darr of Chicago at Ponca City Municipal Airport. In 1941, Darr purchased 80 acres adjacent to the airport and leased the 484-acre airport with its two paved runways. Operating as BFS #6, the Darr School trained 1,100 British pilots, as well as a few Americans, between November 12, 1942 and April 15, 1945. Unlike their American counterparts at other contract schools, British cadets remained in Miami or Ponca City following the completion of their primary flight training before advancing to basic training in North American AT-6 Texans.

In 1942, the Air Corps announced plans to train 3,000 glider pilots. Oklahoma-based flight school Burke Aviation received a contract and opened a glider school at Theldor Field, located north of Vinita, as part of the 27th Glider Training Detachment. With no facilities, other than a sod airstrip and two hangars, cadets had to travel back and forth from Vinita each day by truck. With a limited number of actual gliders, cadets practiced power-off landings in Aeronca L-3 or Piper L-4 Grasshopper aircraft.

Auxiliary Landing Fields

In addition to military and contract airfields, the AAF operated several auxiliary landing fields to enable larger numbers of students to train simultaneously. For example, Miami Field operated four auxiliary fields including the 80-acre Auxiliary Field No. 4 that remains in use today as Walter A. Smalley Airpark. Becoming operational in February 1942 north of Perry, Noble Army Airfield had three bituminous surfaced runways that were used as auxiliary fields for pilots flying out of Will Rogers and later Enid Army Airfield (now Vance AFB).

Rather than falling under a single command, Oklahoma's training facilities were administered by three separate units within the Army Air Forces. Will Rogers Field was a main base under the Third Air Force and Woodward was its subbase. Ardmore Field was administered separately under the Second Air Force. Oklahoma's contract schools, which included Chickasha, Cimarron, Miami, Mustang, Okmulgee, and Ponca City, as well as the advanced school at Frederick, were all under Army Air Forces Training Command.

After the War

When hostilities ended in 1945, the War Department began decommissioning airfields. Surplus items such as furniture, office equipment, and beds were either transferred to other military facilities, sold, or given away. Some buildings were dismantled and their lumber sold for scrap. Others were repurposed and later demolished.

Training airfield sites were typically sold or transferred to local governments as regional or municipal airports. For example, Woodward Army Airfield became West Woodward Regional Airport. A few auxiliary fields also became municipal airports, such as Noble Army Airfield, which is now Perry Municipal Airport. Other auxiliary fields became private airports or, as was the case of Theldor, simply reverted back to grazing land.

Other than the occasional collection of old photographs and memorabilia on display in municipal airport waiting areas, evidence of the roles played by Oklahoma's WWII Army training airfields is not abundant. At Frederick Municipal Airport, grass pushes up between sections of concrete tarmac where training aircraft were once parked in neat rows. Elsewhere, concrete foundations mark locations of razed barracks, dining halls, hospitals, warehouses, and hangars. In an effort to return land to agriculture, the foundations of many some buildings have been removed. Today, few WWII-era buildings survive at Oklahoma's WWII-era airfields, the majority having been lost through demolition or neglect.

Aircraft hangars are the great exceptions to this rule. Because of their utility for storing or maintaining aircraft, several WWII-era hangars remain in active use. For example, a large hangar at Frederick Municipal Airport has been rehabilitated for the use

of a WWII Airborne Demonstration Team, which conducts airborne reenactments, such as the D-Day parachute drop. The interior of the hangar includes storage and repair spaces for parachutes and rigging, as well as maintenance areas, offices, and dormitories. The main hangar area is now used to store historic aircraft, such as a twin-engine Douglas C-47 Dakota. The majority of Oklahoma's WWII-era hangars are leased to private aircraft owners. These include two each at Clarence E. Page Municipal Airport and Chickasha Municipal Airport. Two other WWII-era hangars at Will Rogers World Airport continue to be used by the Oklahoma Air National Guard. Other hangars have been repurposed and are no longer associated with their historical use, such as the former Darr School hangars at Ponca City Municipal Airport, which are now used for manufacturing space within the Darr Industrial Park. Several hangars appear eligible for National Register listing.

The Hangars Today

Prior to WWII, military hangars were built to store fabric covered aircraft easily damaged by exposure to heat or direct sunlight. With the development of all-metal aircraft that could be stored outside, aircraft hangars constructed during and after WWII were used mainly for maintenance and temporary storage. The construction of WWII-era hangars was influenced by shortages of some materials. During the war, a directive called for the use of less strategically important building materials such as wood, brick, gypsum board, and cement asbestos. Steel was reserved for buildings required to be fireproof, such as hangars. With an excellent strength to weight ratio, steel lent itself to prefabrication since independent members could be preassembled.

Truss technology used in WWII-era hangars is based on bridge design where individual steel members are joined in structural triangles and tied using pinned or riveted connections. The most common hangar configurations used in Oklahoma's AAF hangars were closed arch designs supported by steel bowstring trusses. Before WWII, the military began to use monitor roofs with clerestories (rows of windows near the building's roofline) to provide natural light in support of maintenance operations. Most hangars were roofed with bituminous composition shingles or asbestos metal roofs. Frederick AAF's wooden hangar is an exception. In lieu of being constructed with metal, Frederick's hangar was assembled using a wood gambrel design of bolted trusses with vertical and diagonal cross-braced supports.

Among the more prominent features of aircraft hangars are their large openings, which are needed for moving aircraft. Early hangars were sometimes simply left open on each end or partially closed with canvas sheets. Later designs used multi-leaved (segmented) doors. Hung at the top, each door segment moved on rollers along a floor track. Multi-leaved doors required considerable space when closed. When opened, the stack of doors needed room on each side, reducing the diameter of the opening. To address this issue, military hangars were often designed with an external track that extended beyond the main structure. Many hangar doors were designed with windows to increase lighting. Some segmented doors had a smaller "pilot door" added to facilitate entry when the larger main door was closed. In addition to the main structure, many hangars included space for other functions. Lean-tos and half-shed additions offered work and storage space along hangar sides for maintenance shops, parachute rigging rooms, and administrative offices.

XIII. ANNOTATED BIBLIOGRAPHY

Aaron, Jayne. "Historical and Architectural Overview of Aircraft Hangars of the Reserves and National Guard Installations from World War I through the Cold War." edited by Department of Defense, 2011.

This excellent study of all things related to U.S. military aviation during World War II is a must for any examination of historic airfields. Section 4.3 is especially valuable as a guide to military hangar construction since the early 1900s.

Administration, Civil Aeronautics. "U.S. Army/Navy Directory of Airfields."

Washington, D.C.: Department of Commerce, 1944.

This directory offers useful information about the length and alignment of runways at airfields used during WWII. Information is also provided about airport services available, lighting, radio beacons, and instrument landing systems.

Bednarek, Janet R. Daley. *America's Airports: Airfield Development, 1918-1947*. College Station: Texas A&M University Press, 2001.

This is a valuable addition to the historical literature on the evolution of U.S. airport infrastructure by a well-regarded aviation historian. Bednarek examines the development of airports from privately-operated facilities to the huge, municipally-managed components of our modern transport infrastructure.

Brown, Jerold E. *Where Eagles Land: Planning and Development of U.S. Army Airfields, 1910-1941*. Westport, CT: Greenwood Press, 1990.

This book by a U.S. Army historian uses a wealth of military primary sources to explain how the U.S. Army selected, developed, and disposed of sites across the United States during the three decades prior to World War II.

Byrne, J. I. "Hangar Door Design." *Aero Digest* October (1939): 49-50.

This brief article provides an overview of hangar design methods, such as the rolling barn door solution which solved the problem of achieving a large enough door to accommodate increasingly large aircraft.

Craven, Wesley Frank, and James Lea Cate, eds. *The Army Air Forces in World War II*. Washington, D.C.: Office of Air Force History, 1955.

This is the official seven-volume series of U.S. Army Air Force operations commissioned by the government, with individual chapters authored by academic historians after the war using official records. It is especially useful for details regarding operations, logistics, strategy, aircraft acquisition and a myriad of other information. Eight chapters (13-20) of Volume VI: Men and Planes, are individually cited in this bibliography because of their relevance to Army Air Training Airfields and are available online.

Denson, Paula Carmack. *The Royal Air Force in Oklahoma: Lives, Loves and Courage of the British Air Crews Trained in Oklahoma During World War II*. Oklahoma City: Oklahoma Heritage Association, 2006.

This work by a noted historian and preservationist from Ponca City provides a poignant chronicle of British aviators who trained at the Darr School of Aeronautics in Ponca City from 1941-1944. Her work is based on correspondence of cadets in Oklahoma, their family members in England, and families who provided room and board for the cadets.

Division, USAF Historical. *The Preflight Schools in WWII*. U.S. Air Forces Historical Studies. Edited by Defense Vol. Air Historical Study No. 90, Maxwell AFB, Alabama: Air University, 1953. History of Preflight Training in the AAF, 1941-1953.

This declassified report provides an excellent overview of U.S. Army flight training programs and spans flight training prior to WWI through 1953. Topics pertinent to Oklahoma's flight training programs include college flight training, the militarization of preflight schools and programs offered for foreign students.

Ford, Susan Jezak. "Survey Report of World War II Air Bases in Kansas." 13. Kansas City, 2008.

This is a report of a 2008 thematic survey of World War II airfields in Kansas conducted as part of the mitigation of the demolition of the B-29 Pratt hangar. It identified and recorded 16 Army airfields and two Naval air stations constructed for World War II training.

Garner, John S. "World War II Temporary Military Buildings: A Brief History of the Architecture and Planning of Cantonments and Training Stations in the United States." In *USACERL Technical Report CRC-93/01*, edited by Construction Engineering Research Laboratories U.S. Army Corps of Engineers, 102. Champaign, IL: DTIC Document, 1993.

This report is a Section 106 review conducted in response to the Military Construction Authorization Bill of 1983, which directed demolition of World War II-era temporary buildings on federal military installations. The U.S. Army Construction Engineering Research Laboratories (USACERL) coordinated a study of surviving temporary structures at federal facilities, in partial fulfillment of the requirements of the review process. The report describes the main types of temporary structures built between 1939 and 1946, documents their approximate numbers and locations, and provides a historical context to support future study.

Goodwin, R. Christopher, and Associates, Inc. "Historic Context for Department of Defense Facilities World War II Permanent Construction." U.S. Army Corps of Engineers Baltimore District, 1997.

The historic context provides an assessment of historical records related to World War II-era military facilities built within the United States that were classified as permanent construction. The first part examines the historical, architectural, and technological development of permanent facilities. The second part provides a framework

for identifying and evaluating World War II-era defense-related permanent facilities through the application of the National Register Criteria for Evaluation.

Greer, Thomas H. "Individual Training of Flying Personnel." Chap. 17 In *The Army Air Forces in World War II*, edited by Wesley Frank Craven and James Lea Cate, 557-99. Chicago: University of Chicago Press, 1955.

This chapter of Volume VI: Men and Planes, in the government's official history, *The Army Air Forces in World War II*, edited by Craven and Cate, chronicles the training of flight personnel, including pre-flight training, the standard stages of Army pilot training, bombardier training, navigator training, flexible gunnery training, flight engineer training, and radar observer training.

———. "Combat Crew and Unit Training." Chap. 18 In *The Army Air Forces in World War II*, edited by Wesley Frank Craven and James Lea Cate, 600-28. Chicago: University of Chicago Press, 1955.

This chapter of Volume VI: Men and Planes, in the government's official history, *The Army Air Forces in World War II*, edited by Craven and Cate, chronicles combat crew and unit training, the OTU-RTU system, bombardment and fighter training programs, reconnaissance training, and preparation for overseas movement.

———. "Training of Ground Technicians and Service Personnel." Chap. 19 In *The Army Air Forces in World War II*, edited by Wesley Frank Craven and James Lea Cate, 629-73. Chicago: University of Chicago Press, 1955.

This chapter of Volume VI: Men and Planes, in the government's official history, *The Army Air Forces in World War II*, edited by Craven and Cate, chronicles training of ground technicians and service personnel, including individual training in aircraft maintenance and engineering, individual training in communications, individual training in aircraft armament, individual training in aerial photography, individual training in weather, individual training in arms and services specialties, training procedures and problems, training of ground echelons of combat groups, unit training of arms and services personnel, and service and depot group training.

———. "Other Training Programs." Chap. 20 In *The Army Air Forces in World War II*, edited by Wesley Frank Craven and James Lea Cate, 674-700. Chicago: University of Chicago Press, 1955.

This chapter of Volume VI: Men and Planes, in the government's official history, *The Army Air Forces in World War II*, edited by Craven and Cate, chronicles other training programs, including ferry pilots and transport crews, the WASPS, training of administrative officers, combat cadre and staff officer training, and training of foreign nationals.

Guard, Iowa Air National. "Final Report Cultural Landscape Evaluation, Des Moines Air National Guard Base." Des Moines, IA, 2004.

This report is of a historical resources survey of the Air National Guard Base in Des Moines, Iowa.

Haun, A., and J. Henry. "Historic Context: U.S. World War II Development of Airfields on Saipan July 1944-August 1945." Hawaii: Paul H. Rosendahl, 1993.

This historic context examines development of U.S. Navy airfields on Saipan during the war.

Hise, Greg. "The Airplane and the Garden City: Regional Transformations During World War II." In *World War II and the American Dream: How Wartime Building Changed a Nation*, edited by Donald Albrecht, 144-83. Cambridge, MA: The MIT Press, 1995.

Examination of the development of airports in U.S. cities during the Second World War and how they affected urban planning.

James, Eric S. "South Plains Army Air Field: History and Documentation." Texas Tech University, 2014.

This study examines the facility known as South Plains Army Airfield in Lubbock, Texas. This was a major training facility for U.S. Army Air Forces combat cargo glider pilots, many of whom manned gliders during Operation Overlord in 1944. The base was planned, built, used, and then closed in five years.

Kelley, Leo. "Bamboo Bombers over Oklahoma: USAAF Pilot Training During World War II." *The Chronicles of Oklahoma* 68 (1990-91): 360-75.

This is a history of Air Force pilot training in Oklahoma during World War II.

Killebrew, Tom. *The Royal Air Force in American Skies: The Seven British Flight Schools in the United States During World War II*. Denton, TX: University of North Texas Press, 2015.

Examines the Lend-Lease Act of 1941 that allowed British pilots to train in the United States as well as British Flying Training Schools, which were owned by U.S. operators, staffed by American civilian flight instructors, supervised by British RAF officers, and utilized aircraft supplied by the U.S. Army Air Corps.

Kooker, Arthur R. "Broadening the Basis of Procurement." Chap. 13 In *The Army Air Forces in World War II*, edited by Wesley Frank Craven and James Lea Cate, 427-53. Chicago: University of Chicago Press, 1955.

This chapter of Volume VI: Men and Planes, in the government's official history, *The Army Air Forces in World War II*, edited by Craven and Cate, chronicles broadening the basis of procurement, including pilot programs, recruiting procedures, ground-duty personnel, and reserve officers.

———. "The Foundations of a War Training Program." Chap. 14 In *The Army Air Forces in World War II*, edited by Wesley Frank Craven and James Lea Cate, 454-87. Chicago: University of Chicago Press, 1955.

This chapter of Volume VI: Men and Planes, in the government's official history, *The Army Air Forces in World War II*, edited by Craven and Cate, chronicles the foundations of a war training program, including the civilian schools, the expansion of air corps schools, administrative adjustments, and lessons real and simulated lessons from combat.

———. "Procurement at Flood Tide." Chap. 15 In *The Army Air Forces in World War II*, edited by Wesley Frank Craven and James Lea Cate, 488-526. Chicago: University of Chicago Press, 1955.

This chapter of Volume VI: Men and Planes, in the government's official history, *The Army Air Forces in World War II*, edited by Craven and Cate, chronicles procurement at flood tide, including the liberalization of standards for pilot training, the air corps enlisted reserve, recruitment for technical specialties, recruitment of civilian personnel for air depots, instructional personnel, the manpower crisis of 1943, negro personnel, and the personnel distribution command.

———. "Basic Military Training and Classification of Personnel." Chap. 16 In *The Army Air Forces in World War II*, edited by Wesley Frank Craven and James Lea Cate, 527-56. Chicago: University of Chicago Press, 1955.

This chapter of Volume VI: Men and Planes, in the government's official history, *The Army Air Forces in World War II*, edited by Craven and Cate, chronicles basic military training and classification of personnel, including basic training, general classification procedures, evolution of aircrew classification, and the aircrew classification process.

Kuranda, Kathryn M. "Historic Context for Army Fixed Wing Airfields, 1903-1989." Frederick, MD: Christopher Goodwin & Associates, Inc., Frederick, MD for U.S. Army Environmental Center, Aberdeen Proving Ground, MD, 2002.

This historic context examines a long period of military airfield development in Maryland.

Manning, T. A., B. A. Ashcroft, R. H. Emmons, A. K. Hussey, and J. L. Mason. *History of the Air Education and Training Command, 1942-2002*. Washington, D.C.: Government Printing Office, 2005.

This guide offers useful information on the production of pilot training programs and training sites.

McFarland, Stephen L. *A Concise History of the U.S. Air Force*. Washington, D.C.: Air Force History and Museum Program, 1997.

This short history of the USAF includes a chapter on World War II.

Milbrooke, Anne. "Guidelines for Evaluating and Documenting Historic Aviation Properties." edited by National Park Service U.S. Department of the Interior. Washington, D.C.: National Register of Historic Places, 1998.

This National Register Bulletin identifies types of historic aviation properties and explains how to apply the National Register criteria to them.

Murdock, Scott D. "Royal Air Force Training in Oklahoma During World War II." http://www.airforcebase.net/aaf/raf_ok.html.

This website explores U.S. Army training schools that trained British pilots at several locations in Oklahoma during WWII.

———. "WWII Army Air Forces Contract Flying Schools." <http://www.airforcebase.net/aaf/schools.html>.

This website explores U.S. Army contract flying schools in Miami and Ponca City during WWII.

National Park Service, Cultural Resources and Museum Management Division. "Fort Barry Balloon Hangar and Motor Vehicle Sheds: Abbreviated Historic Structures Report." San Francisco, CA: Golden Gate National Recreation Area.

This report examines the historic dirigible hangar near San Francisco.

Savage, Cynthia. "National Register Nomination for the Darr School of Aeronautics Hangar No. 3, Ponca City, Oklahoma (Nr06000794)." Washington, D.C.: National Register of Historic Places, 2006.

This nomination provides excellent architectural and historical information regarding Ponca City's three surviving Darr School hangars recorded by this survey.

Shaw, F. J. *Locating Air Force Base Sites: History's Legacy*. Washington, D.C.: Air Force History and Museum Program, 2004.

Examines the period from 1907 through 1947 as establishing the basic foundation for U.S. Force bases and provides an overview of factors that were considered in establishing military airfields.

Tagg, Martyn D., Sonya Cooper, and Jean Fulton. "Airplanes, Combat and Maintenance Crews, and Air Bases: The World War II and Early Cold War Architectural Legacy of Holloman Air Force Base (ca. 1942-1962)." 364. Alamogordo, NM: Holloman AFB, 1998.

This historic context includes information for 18 facilities from the WWII era (pp. 235-236, 242-245).

Thole, Lou. *Forgotten Fields of America: World War II Bases and Training Then and Now*. Missoula, MT: Pictorial Histories Publishing Co., 1996.

This book offers an overview of U.S. Army Air Corps expansion before and during WWII with a focus on training facilities. The author notes that in 1938 U.S. Army had just 17 air bases in the continental U.S. for primary, basic and advanced flight

training. In lieu of serving as a reference or directory, the book offers an overview of the Air Corps buildup from a human viewpoint.

Tierney, Richard. *The Army Aviation Story*. Colonial Press, 1963.

This book offers a history of army use of spotter aircraft with initial testing carried out at Post Field located at Ft. Sill in southwestern Oklahoma. The program provided flight training for field artillery officers who flew single engine aircraft such as L-4s (Piper J-3 aircraft) as spotters or liaison pilots.

Webster, Julie. "Historical and Architectural Overview of Military Aircraft Hangars: A General History, Thematic Typology, and Inventory of Aircraft Hangars Constructed on Department of Defense Installations." United States Air Force Air Combat Command, 1998.

This is one of the very best sources on the evolution of aircraft hangars on U.S. military bases. This report was prepared as part of the Base Realignment and Closure (BRAC) activities at the Department of Defense. It was produced in response to inquiries about modifying hangars and is based on assessments in accordance with Sections 106 and 110 of the National Historic Preservation Act (NHPA).

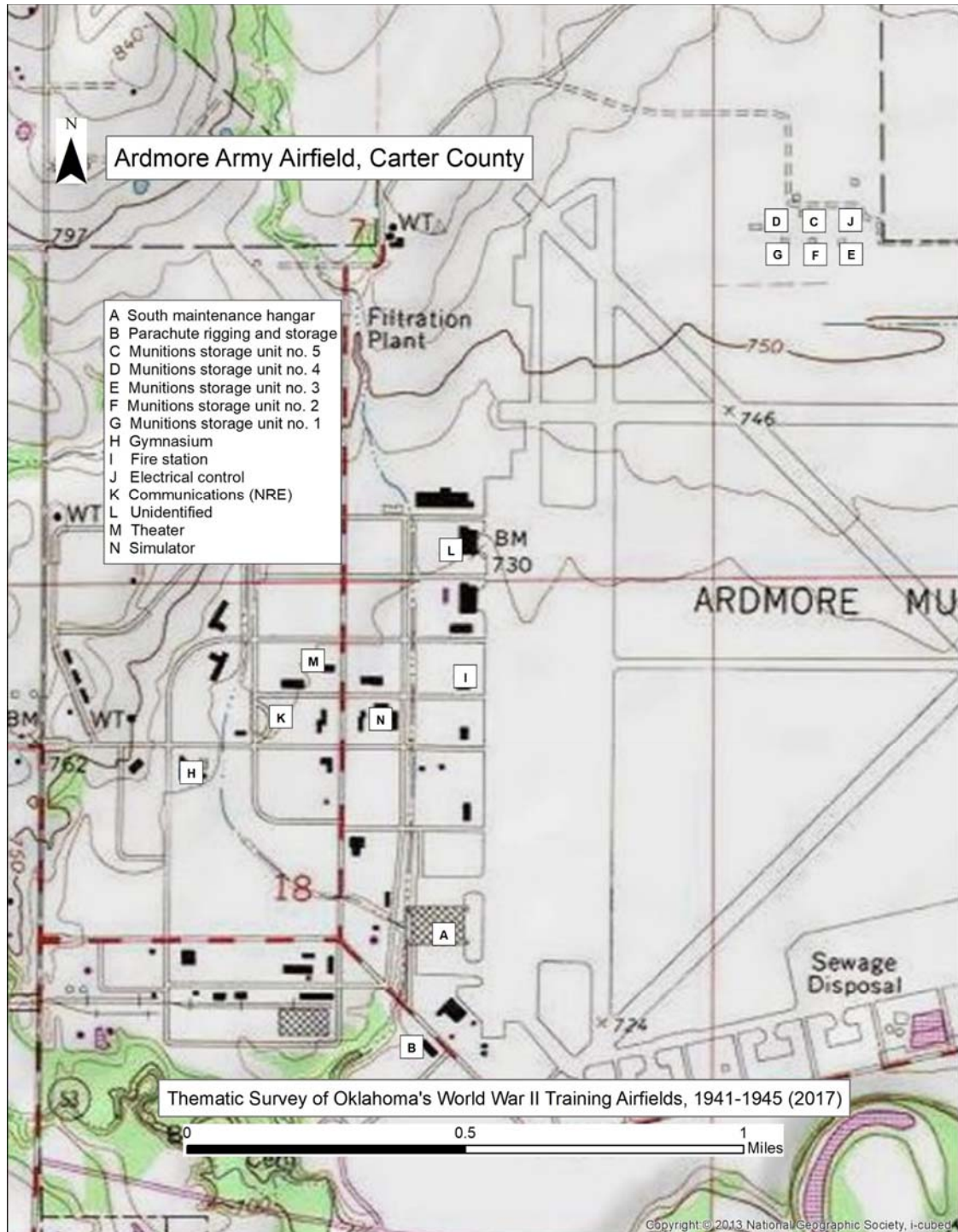
XIV. SUMMARY

This project increased the total area of the state that has been inventoried and increased the number of recorded properties in a cost-effective manner. Individual resources were identified and assessed for National Register eligibility with consideration for the age, significance, and integrity of each resource. The survey and analysis provided information for more efficient and objective cultural resources management and urban planning decision-making by state and federal agencies. It also assists with federal policy compliance, implementing federal preservation guidelines, and it provides the basic background work necessary for the National Register nomination process. The information also provides a starting point for individual researchers interested in historic preservation and private sector interests pursuing initiatives leading to resource rehabilitation.

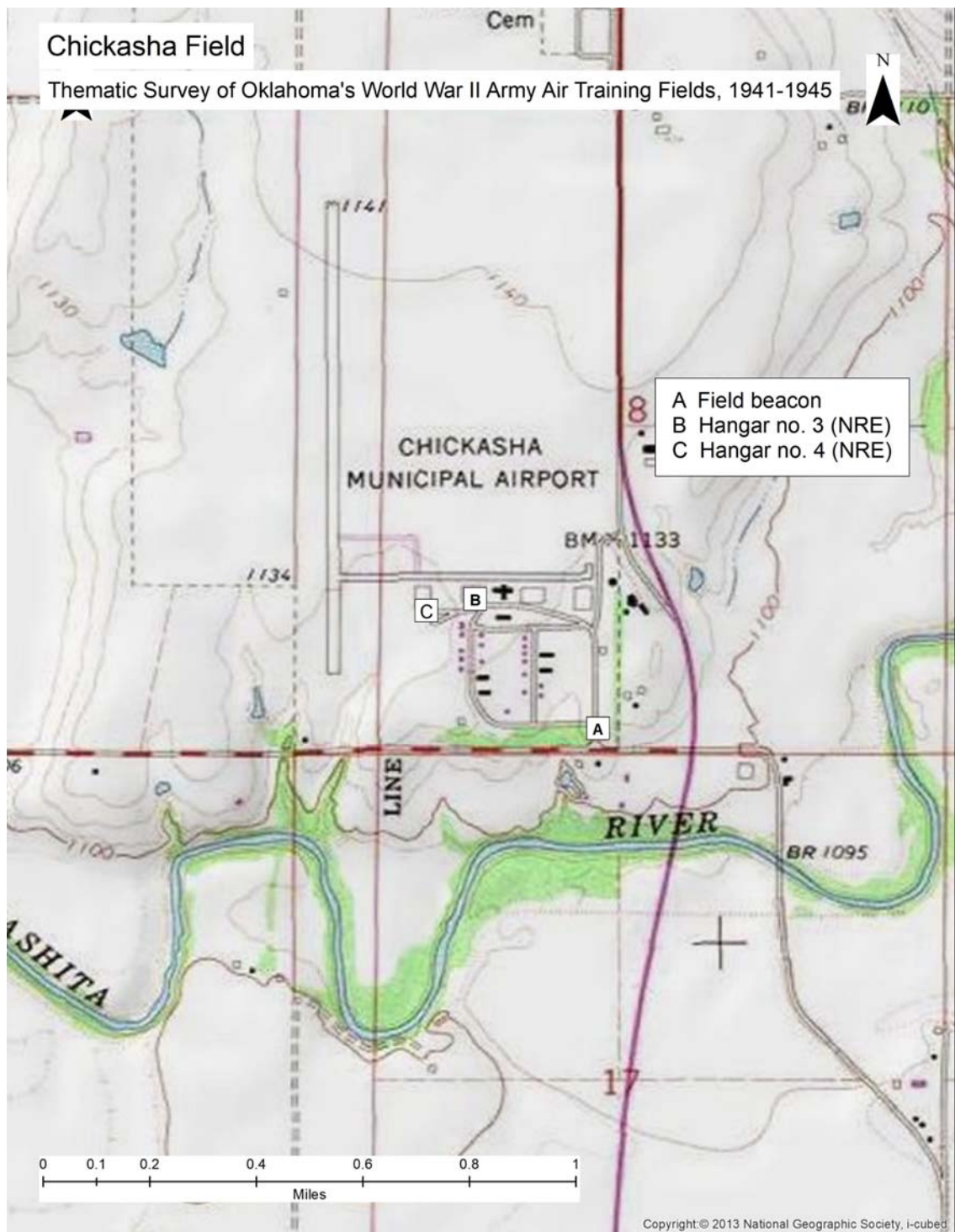
This project was completed as a collaborative effort by personnel at Oklahoma State University. Brad Bays, Associate Professor of Geography, was the project director. Thomas A. Wikle was co-PI. Bays and Wikle conducted the fieldwork, performed the analysis, and drafted the report. Charles Leider, OSU Professor Emeritus of Architecture, served as the architectural consultant and drafted the Architectural Review. Bays authored the balance of the report. Catherine Shropshire assisted with data entry. All work was performed under contract from the Oklahoma State Historic Preservation Office (Project 16.401) using funds from the United States Department of the Interior, National Park Service.

XV. RECORDED RESOURCE LOCATOR MAPS

The following locator maps are provided for the 11 sites where this survey recorded resources.



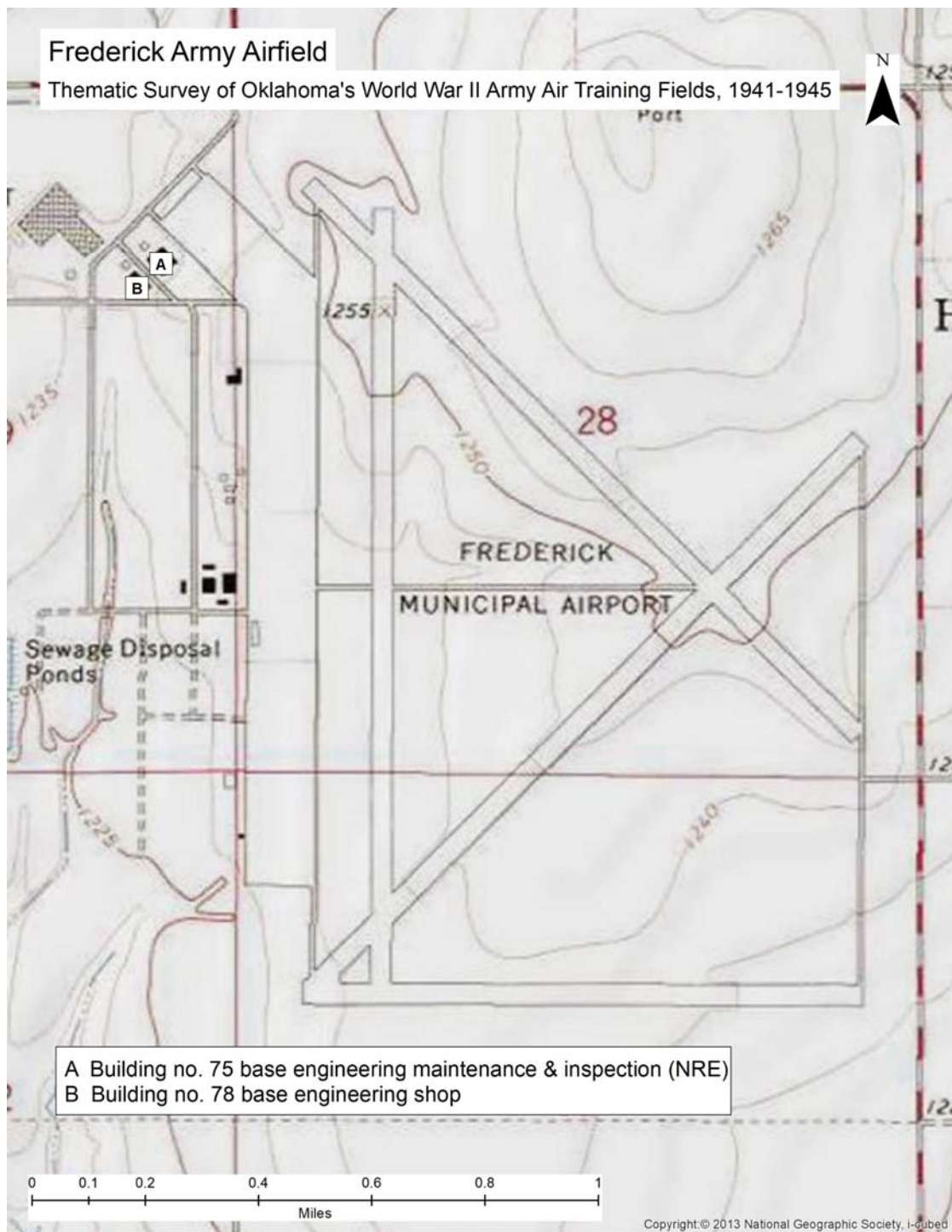
Ardmore Army Airfield, Ardmore, Carter County



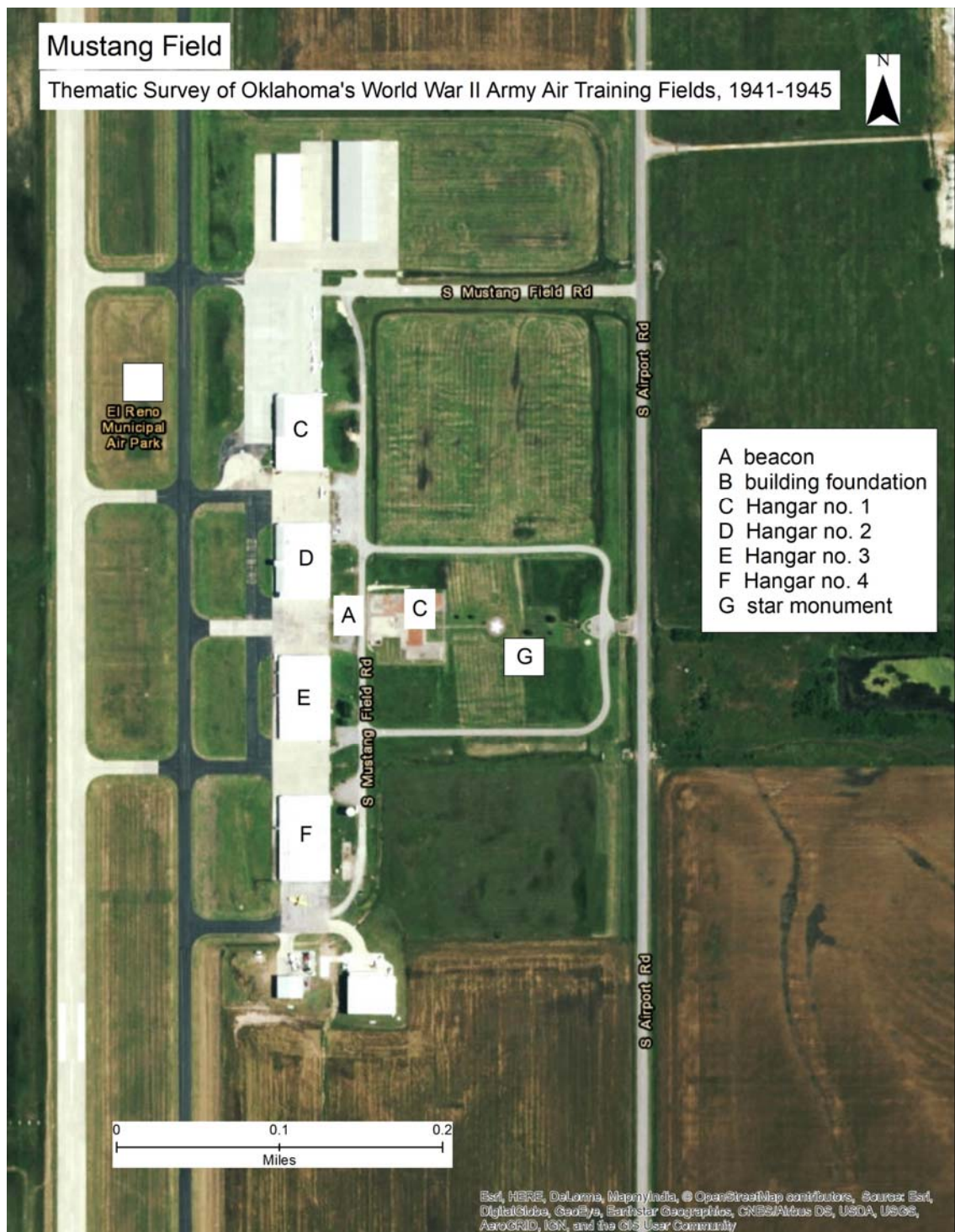
Chickasha Field, Chickasha, Grady County



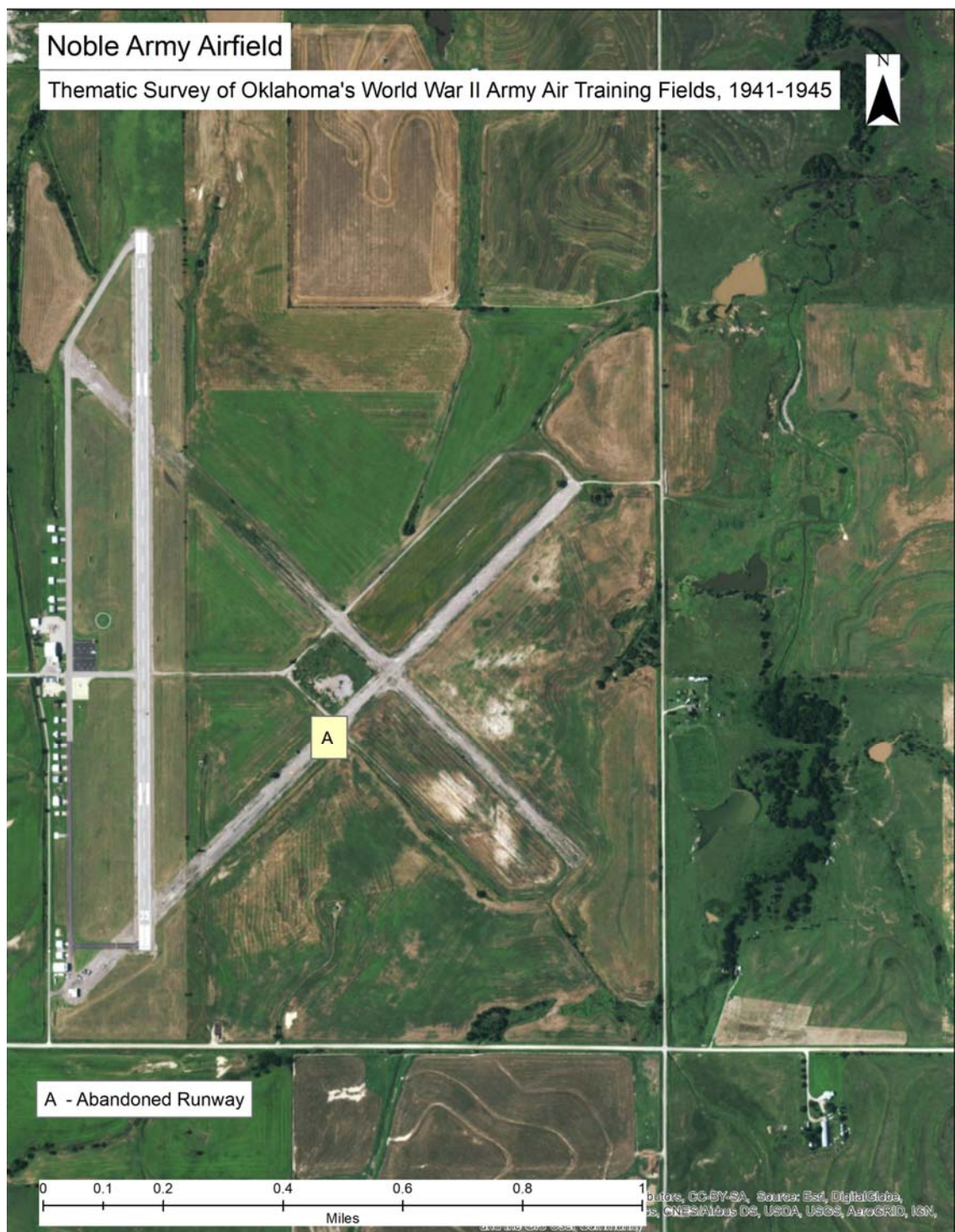
Cimarron Army Airfield, Oklahoma City, Canadian County



Frederick Army Airfield, Frederick, Tillman County



Mustang Field, El Reno, Canadian County



Noble Army Airfield, Perry, Noble County



Okmulgee Field, Okmulgee, Okmulgee County



Ponca City Airport, Ponca City, Kay County



Tulsa Municipal Airport, Tulsa, Tulsa County



Woodward Army Airfield, Woodward, Woodward County

XVI. ARCHITECTURAL REVIEW

Provided by:

Charles L. Leider, FASLA, FAICP, RLA

Professor and Director Emeritus

Professor and Program Director Emeritus, Landscape Architecture Program,
Oklahoma State University

The Thematic Survey of Oklahoma's World War II Training Airfields, 1941-1945 emphasized the recording of extant properties at a minimum level of documentation and is designed to provide a cost-effective approach for increasing not only the area inventoried within the state but also the number of recorded properties. The results provide information useful in making management decisions regarding historical architectural resources eligible for the National Register of Historic Places.

The purpose of the survey was to locate, identify, and document World War II airfields that are eligible for nomination to the National Register of Historic Places and to develop a historic context in which to evaluate related resources.

The project consisted of a thematic survey of World War II-era Army training airfields in Oklahoma, 1941-1945, listed below. The airfields included in the list are 13 of the 19 airfields identified in the article "The Legacy of US Army Flight Training in Oklahoma, 1941-1945," published in volume 91(4) of *The*

Chronicles of Oklahoma. The additional six airfields are located on federal land and/or have been previously documented and are not included in this survey.

No resources were recorded at the Theldor Army Airfield site, located northeast of Vinita. Like many facilities, Theldor was closed in 1945 and its buildings and structures have since been removed or razed, and the site is now located on private agricultural land. Likewise, no resources were recorded at Will Rogers Field, the present site of Will Rogers World Airport in Oklahoma City. The site visit revealed that all extant World War II-era resources are actually located on federally-administered property and under the authority of the Oklahoma Air National Guard (an Air Reserve Component of the U.S. Air Force) and the Federal Aviation Administration (FAA).

Included here is a list of the Oklahoma's World War II Training Airfields, 1941-1945 and the airport's present Name Controlling Organization:

- Ardmore Army Airfield, Ardmore Municipal Airport, Averitt Express;
- Chickasha Field, Chickasha Municipal Airport, Chickasha Wings;
- Cimarron Army Airfield, Clarence E. Page Municipal Airport, Legacy Aviation Services;
- Frederick Army Airfield, Frederick Municipal Airport, Henniges Automotive;
- Miami Municipal Airport, Miami Municipal Airport, Don Hume Leather Goods;
- Mustang Field, El Reno Municipal Airport, Legacy Aviation;

- Noble Army Airfield, Perry Municipal Airport;
- Okmulgee Field, Okmulgee Municipal Airport, Covington Aircraft Turbines;
- Ponca City Airport, Ponca City Municipal Airport, Lindsay Manufacturing, Vacu-Maid;
- Theldor Army Airfield, Vinita vicinity (closed in 1945 and on private land);
- Tulsa Municipal Airport, Tulsa International Airport, Tulsa Beech, Spartan School;
- Will Rogers Field, Will Rogers World Airport, Air National Guard, FAA.

Purpose

The purpose of this architectural review is to confirm determinations by the co-PIs regarding their National Register eligibility assessments of the recorded resources. This was accomplished by examining the minimal level documentation materials (resource photographs and Historic Resource Identification Forms) vis-à-vis the project report, especially the project's historic context and results.

General Observations

This thematic survey primarily identified extant buildings and a few structures and objects associated with air training facilities used during World War II. The airfield facilities examined by this study experienced a range of changes; some

were completely obliterated immediately after the war (Theldor), others were initially abandoned and later incorporated into uncontrolled general aviation airports (Noble, located north of Perry), others were swallowed up by larger municipal airports offering commercial aviation services (Tulsa, Will Rogers), while others, mostly in the larger towns (Ponca City, Okmulgee) continued on after the war to function as controlled, municipal general aviation facilities. It should be pointed out that the latter class, those training airfields that ended up in general use without major transformations, seem to be the sites with the best collections of resources retaining high degrees of integrity.

The emergency of war preparations demanded that some facilities be constructed as rapidly as possible and were always considered temporary. Most military buildings, especially those planned by and constructed under direct Army supervision, were not adorned with architectural décor in the slightest. However, the fact that many military facilities were subcontracted to private firms, and since government contracts often provided for the transfer of facilities to municipalities when the war was concluded, many hangars did receive architectural adornment (Ponca City, Okmulgee).

The Darr School hangars on the east side of the present runway at Ponca City Municipal Airport have been utilized by manufacturers since the war. Their exteriors have been drastically altered so that the resources associated with the Darr School campus are essentially obscured. The RAF-associated facilities in Miami have also been obscured except for the NR-eligible west hangar.

Building No. 75 at Frederick is also NR-eligible. Its exterior cladding of wood shiplap is in places deteriorating, but it is structurally in good shape. The exterior retains a good degree of integrity and it is used by a historical reenactment team who celebrates the role of the facility.

Specific Observations

The airfields have a distinctive triangular runway layout that was adopted at many airfields to accommodate tail-wheel aircraft that had difficulty operating in strong crosswinds. Taxiways were laid out parallel to runways and built with reinforced concrete to handle the stress caused by turning larger aircraft. Windsocks were built adjacent to fields and runways, and taxiway lights were installed to support night operations.

In addition to runways, taxiways, and aprons, military airfields required control towers, hangars, munitions storage buildings, and cantonment areas with barracks for officers and enlisted personnel, commissaries, supply buildings, administrative offices, and fire stations. There were also training and classroom buildings, recreation halls, swimming pools, chapels, post offices, and theaters. Most buildings followed a standard layout so as to facilitate rapid construction, and many were designed for only short-term use. For example, many support buildings were often made of simple frame construction with plywood wall cladding, gabled roofs covered with tarpaper, and open-air electrical wiring. Buildings designed to accommodate heavy tasks, such as aircraft maintenance, were constructed over slab-on-grade concrete pads.

The largest buildings at any Army air training facility were the aircraft hangars. Some hangars were constructed with cinder block walls that supported a huge arched roof supported by steel trusses similar to those used in bridge construction. Other hangar roofs were constructed of laminated lumber, perhaps due to the need for other wartime uses of steel, and appear much heavier than the steel truss variety. Hangar doors usually consisted of a series of 8-12 large, hanging slab doors that could be moved by hand along a track so as to be amassed vertically and open the entire side of the hangar. Single-story shed-roofed additions were built along one or more sides of many hangars so as to accommodate administrative functions, storage, maintenance, and other needs. Some hangars had a brick chimney connected to a boiler to provide heat.

An airfield's buildings and facilities were accessible by a simple grid system of roads. The tallest structures at each airfield usually included a control tower, a water tank, and a red and white tower that supported the airfield's rotating beacon. Planned and built as self-contained towns, Army training airfields were usually completed within 18 months. By 1943, the Army Air Forces (AAF) had charge of 783 airfields in the continental United States, including smaller sub-bases and auxiliary airfields.

Conclusions

The most significant features of the Oklahoma's World War II Training Airfields worthy of consideration for nomination to the National Register of Historic Places as individual aircraft hangars. The most notable properties include the two large

hangars at Chickasha, the large, rare wood-framed hangar at Frederick, the brick and stucco Art Deco hangar at Okmulgee, the high-integrity hangar at Miami, and the brick Art Deco hangar at Ponca City.