North Carolina Department of Natural and Cultural Resources

State Historic Preservation Office

Ramona M. Bartos, Administrator

Governor Roy Cooper
Secretary Susi H. Hamilton

Office of Archives and History
Deputy Secretary Kevin Cherry

January 23, 2018

Marvin A. Brown
AECOM Technical Services
701 Corporation Center Drive
Raleigh, NC 27607

marvin.brown@aecom.com

Re: Final Historic Structures Documentation Report for Voice of America Transmitting Station Site A, Beaufort County, ER 15-2838

Dear Mr. Brown:

Thank you for your December 5, 2017, transmittal of the above-referenced report. We apologize for the delayed response, but trust you will understand. We have reviewed the submittal and find that it fulfills the conditions outlined in our finding of no adverse effect for the transfer of the historic transmitting station from the General Services Administration to the North Carolina Wildlife Resources Commission.

The photographic recordation and report will help ensure the history of this property, which was a key element in the United States' Cold War effort. While there is no way to convey the size and number of the various antennae, your report will certainly be of value to understanding the site, its technology, and significance.

By copy of this letter, we are notifying the Wildlife Resources Commission that it has fulfilled its responsibilities for this matter.

Sincerely,

Renee Gledhill-Earley

for Ramona M. Bartos

cc: Wildlife Resources Commission

LETTER OF TRANSMITTAL

Received: 12/14/17
State Historic Preservation Office

AECOM Technical Services
of North Carolina, Inc.
701 Corporate Center Drive
Raleigh, NC 27607
919-854-6200

Date: December 5, 2017	***Project Number:*** 60485338
Reference: **FINAL** Historic Structures Survey Report: Voice of America Transmitting Station Site A, Beaufort County, North Carolina (ER 15-2838) for North Carolina Wildlife Resources Commission	

ER 15-2838

TO: Renee Gledhill-Early
Environmental Review Coordinator
North Carolina State Historic Preservation Office
109 East Jones Street
Raleigh, NC 27601
919-807-6579

Due -- 01/11/18
H-

WE ARE SENDING: [ ] Herewith [ ] Under Separate Cover [ ] Originals [ ] Prints [ ] Shop Drawings
[ ] Letter(s) [ ] Estimates(s) [ ] Sepias [ ] Sketches [ ] Specifications
[ ] Report(s) [ ] Specifications [X] As Noted Below

THESE ARE FORWARDED: [ ] As Requested [ ] For Approval [ ] For Corrections [X] As Noted Below
[ ] Your Information [ ] For Comment [ ] For Construction

Drawings	No. of Copies	Date	Description
	1	December 2017	Hard copy of above-referenced report
	1	December 2017	Electronic copy of above-referenced report

SENT VIA: [X] Our Messenger [ ] Federal Express [ ] Certified Mail [ ] As Noted Below
[ ] Your Messenger [ ] UPS [ ] U.S. Mail

Very truly yours,

AECOM Technical Services of North Carolina, Inc.

Marvin A. Brown

Cc: George Norris (George.Norris@ncwildlife.org)

HISTORIC STRUCTURES SURVEY REPORT
for
Voice of America Transmitting Station Site A
Beaufort County, North Carolina
(ER 15-2838)

Prepared For:

State of North Carolina
North Carolina Wildlife Resources Commission

Prepared By:

AECOM Technical Services of North Carolina, Inc.
701 Corporate Center Drive
Raleigh, NC 27607

Marvin A. Brown
Principal Investigator

October 2017

HISTORIC STRUCTURES SURVEY REPORT
for
Voice of America Transmitting Station Site A
Beaufort County, North Carolina
(ER 15-2838)

Prepared For:

State of North Carolina
North Carolina Wildlife Resources Commission

Prepared By:

AECOM Technical Services of North Carolina, Inc.
701 Corporate Center Drive
Raleigh, NC 27607

Marvin A. Brown
Principal Investigator

October 2017

TABLE OF CONTENTS

I. INTRODUCTION

In December 2015, the General Services Administration (GSA) determined, and the North Carolina State Historic Preservation Officer (SHPO) agreed, that Voice of America Transmitting Station Site A (VOA Site A) in Beaufort County (BF-0179) was eligible for listing in the National Register of Historic Places (NRHP) under Criteria A and C for its Cold War historical significance and technology (Figure 1). As a condition for the GSA to transfer VOA Site A to the North Carolina Wildlife Resources Commission (NCWRC), the NCWRC was required to engage the services of an architectural historian who met the *Secretary of the Interior's Professional Qualification Standards* (*Secretary's Standards)* to thoroughly document the entire property, including the landscape, towers, antennae, building interiors and exteriors, equipment, and any other resource(s) necessary to the operation of the site. This documentation was to take the form of digital photographs and a Historic Structures Survey Report (HSSR). It was divided into two separate components.

The photographic recordation was completed and submitted in 2016 by Marvin A. Brown of AECOM Technical Services of North Carolina, Inc. Mr. Brown meets the *Secretary's Standards* for architectural history and history. He completed this HSSR, addressing the second documentation component, in September 2017. It is based upon fieldwork he conducted in 2016 and research he largely conducted in 2016 as well.

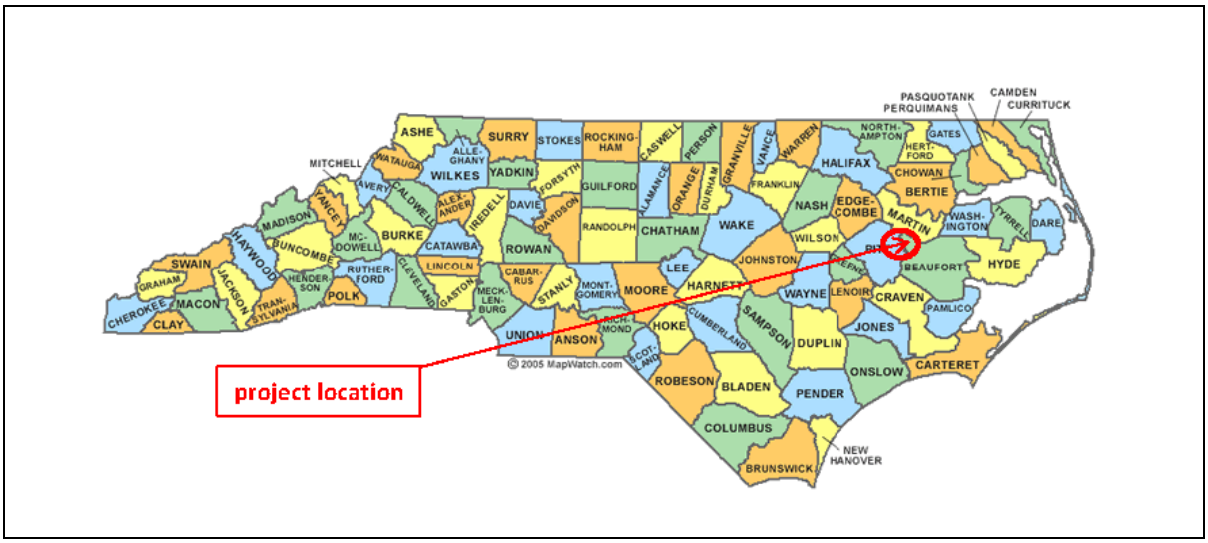


Figure 1. Project location map

II. SIGNIFICANCE

The GSA and North Carolina SHPO agreed in December 2015 that VOA Site A in Beaufort County (BF-0179) was eligible for NRHP listing under Criteria A and C for its Cold War historical significance and technology. As discussed below, Site A (with its companions, Site B and Site C) was at the center of America's efforts to broadcast news and other programming abroad, and thereby help form foreign public opinion, during the Cold War. When the three sites opened in December 1962, they comprised "the world's largest radio broadcasting station, by any standard" (Rhine 1968:45). Site A (with its companions) was not only significant for its role in transmitting information generated by the U.S. government during the Cold War. It was a technological achievement. The three sites utilized the latest technology in the fields of broadcasting and transmission.

III. HISTORICAL BACKGROUND AND CONTEXTS

A. Voice of America

The Voice of America began as part of the U.S. Foreign Information Service (FIS) in mid-1941, on the brink of American entrance into World War II. The operation was modest: a small staff in New York produced material for broadcast to foreign countries via contracts with privately held shortwave stations. These included a Westinghouse transmitter that broadcast in French and one owned by Crosley Corporation that transmitted in German and Italian. With the U.S. officially at war, the FIS began direct broadcasts to Asia from San Francisco in December 1941 and to Europe via BBC transmitters in February 1942. By January 1943 the VOA had taken over or constructed 23 transmitters and broadcast programming in 27 languages. At the war's end, it utilized 38 transmitters, most operated by private firms (Mackenzie 2000:1-2; Belanger 2003:1-3; Voice of American Museum 2015).

Support for the VOA briefly slackened following the end of the war. The advent of the Cold War and the Korean Conflict, though, led Congress to increase its funding. In 1950 the VOA expanded its language services and planned the construction of transmitters on the East and West coasts. Allegations of communist infiltration in early 1953 held up its building program, but its value as an official voice of America remained unchallenged. In August 1953 the federal government established the United States Information Agency (USIA) of which the VOA was the largest component. In 1954 the VOA relocated its headquarters from New York City to Washington, DC (Figure 2) (Mackenzie 2000:2-3).

Figure 2. Central programming services division of Voice of America radio in New York, February 27, 1953 (source: https://www.bbg.gov/who-we-are/history/; photographer: John Rooney, AP)

The VOA finalized a charter, written by its staff, in 1960 (Mackenzie 2000:3). The brief document, formally enacted by Congress in 1976, states the agency's principals

> **Sec. 503.** The long-range interests of the United States are served by communicating directly with the peoples of the world by radio. To be effective, the Voice of America must win the attention and respect of listeners. These principles will therefore govern Voice of America (VOA) broadcasts:
>
> (1) VOA will serve as a consistently reliable and authoritative source of news. VOA news will be accurate, objective, and comprehensive.
>
> (2) VOA will represent America, not any single segment of American society, and will therefore present a balanced and comprehensive projection of significant American thought and institutions.
>
> (3) VOA will present the policies of the United States clearly and effectively, and will also present responsible discussions and opinion on these policies (Public Law 94-350).

During the 1960s and 1970s, the VOA increased its language services. In the 1980s it upgraded its transmission facilities in the U.S. and abroad. This included the 1985 establishment of a special Cuban service called Radio Marti broadcast from the Greenville Transmission Station (Mackenzie 2000:4-5).

The federal government began to consolidate its international broadcasting services through creation of the Bureau of Broadcasting in 1990. It continued consolidation in 1994 by establishing the International Broadcasting Bureau (IBB) within the USIA and creating an oversight authority over non-military government international broadcasting, the Broadcasting Board of Governors (BBG). In 1999 the current structure governing the VOA was created. The USIA was abolished and the BBG became an independent federal agency with authority over the IBB, the VOA, and other international broadcasting entities (Mackenzie 2000:7).

Between 1941 and 2000, the VOA broadcast programming in about 90 different languages. It currently produces content in 61 languages (Mackenzie 2000:10-12; Broadcasting Board of Governors). The advent of expanded and new means of communication in the past quarter century has threatened the VOA's continued existence. As discussed below, two of the three principal components of the Greenville Transmission Station, Sites A and C, have been closed and partially demolished. In 2017 Site B continued in operation.

B. Voice of America Transmitting Facilities

Through much of its history, the VOA broadcast from transmitting facilities operated by private entities. As result of a meeting with federal officials in January 1942, major American broadcasters began to plan and construct transmitters for VOA use during the war. In July 1944 the VOA began broadcasting from a multi-transmitter complex erected by the Crosley Broadcasting Corporation in Bethany, Ohio. By the end of the year, the VOA was broadcasting over the Pacific from California facilities built by the Central Broadcasting System (CBS) in Delano and the National Broadcasting Company (NBC) in Dixon. These transmitting plants remained in the hands of Crosley, CBS, and NBC until 1962, when the USIA/VOA took over direct ownership (Voice of America Museum 2014 and 2015) (Figure 3 and Figure 4).

The Dixon station closed in 1979, reopened in 1983, and was shuttered for good in 1988. In 1994 the federal government shut down the Bethany station. Delano closed in 2007. Modern aerial photographs indicate most of the buildings at the three facilities remain intact, although their fields of antennae have been reduced. In 1997-1998 Bethany's towers were brought down and much of its property was given to the local community. Twenty acres and the transmitting building, however, were saved. They now hold the National VOA Museum of Broadcasting. The NRHP listed the "Voice of America Bethany Relay Station" in 2006 (Schneider 2014; O'Neal 2014; Voice of America Museum 2014 and 2015).

Figure 3: Voice of America Bethany Relay Station (source: http://www.waymarking.com)

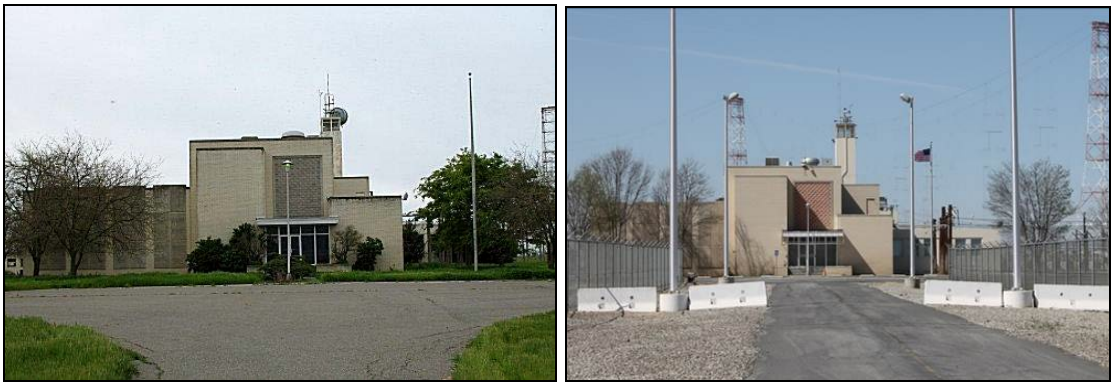


Figure 4. Voice of America Dixon Relay Station, at left (source: http://wikimapia.org), and Delano Relay Station, at right (source: *Californian*, Mar 29, 2014; photographer: Theo Douglas)

In addition to the three stations ultimately owned by the USIA, the VOA operated through various other, smaller facilities during and after World War II. During the war it broadcast from three additional high-frequency transmitting facilities on the East Coast. Two were in New Jersey—one in Bound Brook owned by NBC, the other in Wayne owned by CBS—and a third was owned by the General Electric Company in Schenectady, New York. It also supported construction of facilities at Lualualei, west of Honolulu, Hawaii, and on Saipan in the Northern Mariana Islands (Dail 2015:55-56). The Lualualei antenna foundation system at the VOA facility (Site 50-80-08-7081) was recommended as NRHP-eligible in 2009; the ruinous transmitting station was not (Reith 2009:40) (Figure 5).

Figure 5. Lualualei antenna foundation system and ruinous station (source: Reith 2009)

Due to Soviet jamming of VOA signals beginning in 1948, the VOA transmitting facilities on the West Coast and in New Jersey and New York were declared obsolete (Dail 2015:56-57):

> At this time, studies began to be conducted through a partnership between the U.S. government and academia on how to overcome the jamming. . . . The results of the studies were that, in order to provide the maximum strain on the Soviet jamming system, there must be an acceptable number of very high-powered transmitters placed in very strategic locations for ionospheric propagation into the target areas. Supplementary facilities would support coverage for Africa, South America, the Caribbean, the Far East, and islands in the Pacific. These recommendations would launch the first expansion of VOA and become known as the Ring Plan. . . . This would eventually result in new relay stations including the Greenville, NC site.

VOA growth in the early 1960s included the construction of the Greenville Transmitting Station and six smaller relay stations in Monrovia, Liberia; Rhodes and Kavala, Greece; Tinang, Concepcion, Philippines; Bangkok, Thailand; and Hue, Vietnam (Dail 2015:61-62). The VOA subsequently upgraded some facilities, but this was its first and last major construction program.

C. Greenville Transmitting Station and Site A

Introduction

In December 1962 the VOA completed construction of "the world's largest radio broadcasting station, by any standard" (Rhine 1968:45). First generically called the Consolidated East Coast Facility and then the Greenville Transmitting Station, the facility had three major components—Site A, Site B, and Site C—located within 15 miles of the small eastern North Carolina city of Greenville (Figure 6). Site C stood about six miles west of the city's center. Its 640-acre property held a receiving building framed by a field of tall antennae. (The building still stands, but the antenna field does not.) Via a microwave system, Site C received programming from the VOA studios in Washington DC, which it sent on to Sites A and B for transmission.

Sites A and B held nearly identical transmitting buildings. Site B, near the Black Jack community about 14 southeast of downtown Greenville, occupied 2,715 acres. Site A, near the Bear Grass and Leggetts Crossroads communities in Beaufort County, was also built about 14 miles from Greenville, to its northeast on 2,220 acres. The two transmitting buildings—via scores of curtain, rhombic, and log periodic shortwave antenna arrays spread across their sites—broadcast VOA programs to the Caribbean, Central and South America, Europe, and West Africa (Rhine 1968:45-46) (Figure 7).

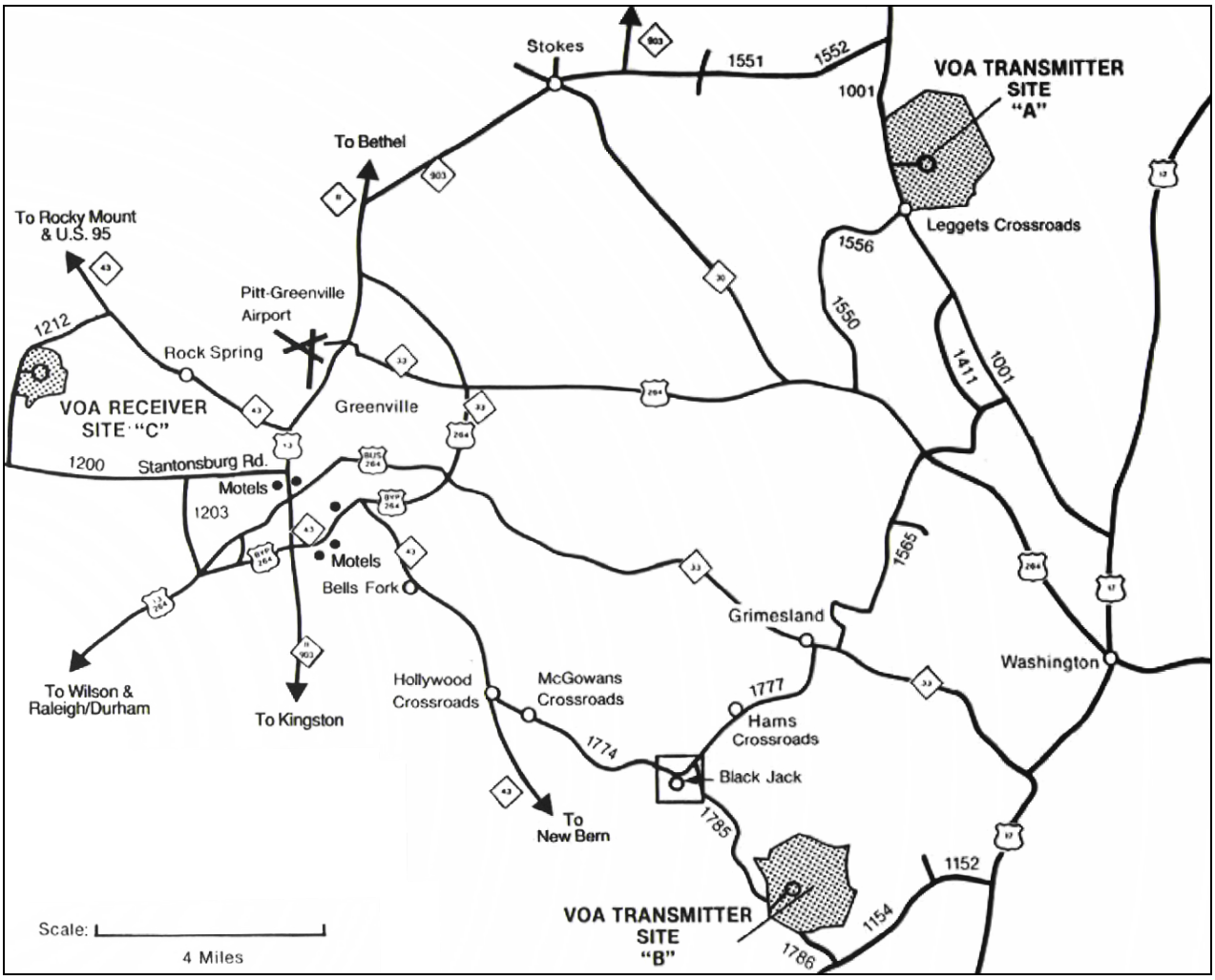


Figure 6. Map locating Greenville Transmitting Station Sites A, B, and C (source: Dail 2015)

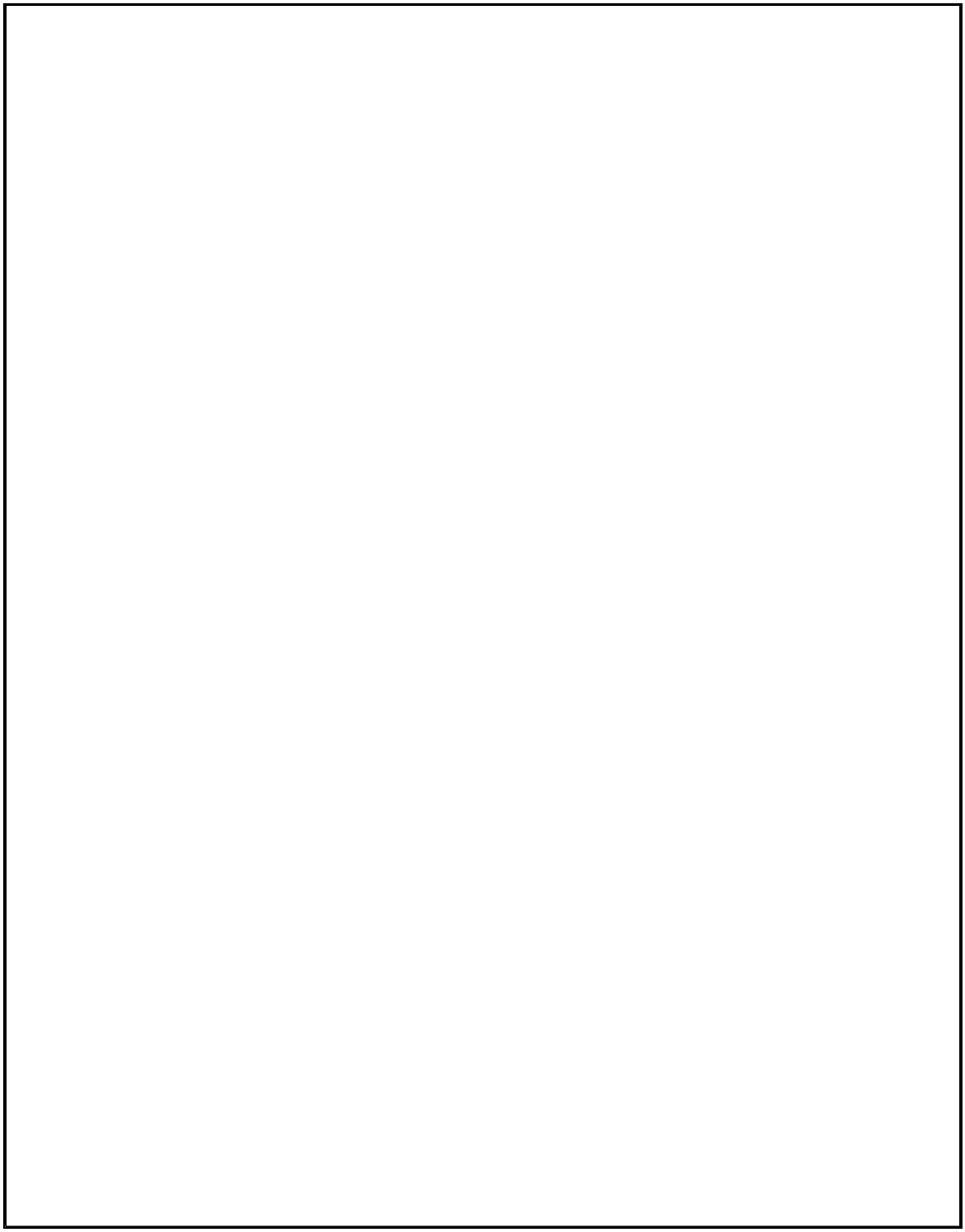


Figure 7. Primary coverage area of Greenville's transmitters in 1968 (source: Rhine 1968)

Architects, Engineers, Fabricators, and Contractors

Many individuals and entities labored to design, construct, and equip the three principal components of the Greenville Transmitting Station. These included VOA engineers, Austin Company (or Austin Co.) engineers and designers, contractors Ling-Temco Electronics and Collins Radio Company, the manufacturing division of Republic Steel Corporation, and John F. Beasley Construction Co.

The VOA initiated and assisted in engineering the project. In 1958 it designated Howard DeLong as the project manager. One of the VOA's first employees, DeLong had started working with the agency in early 1942. Between 1950 and 1952, in collaboration with the Smith Meeker Engineering Company of New York, he put in nine months of time designing and setting up the specifications for the VOA's new studios in Washington, DC. His first task on the Greenville project was to go to North Carolina with another VOA engineer, Julie Ross, to select the sites for the installation. Thirty-eight potential sites were considered. The Greenville-area site was officially selected and land acquisition began in 1959 (*Gates Studio Review* 1955; DeLong 1989; Rhine 1968:45).

The site selection factors were many, including location sufficiently south to avoid the northern aurora zone; relative proximity to the VOA studios in Washington; remoteness from other communication facilities to reduce interference; reliable electric power sources; flat terrain; and the availability of large tracts of land distant from built-up areas. The Greenville site, about 265 miles south of Washington, fit the bill. Due to the numbers of transmitters and antennae, two equal transmitting facilities were to be built. To avoid interference with broadcasts, the receiving facility was planned as a third separate facility. Finally, to assure continuous operation, the two transmitting facilities were connected to different power grids (Rhine 1968:45-46; United States Information Agency 1963:12; Dail 2015:66-68).

DeLong recalled in a 1989 interview that, with the sites selected:

> GSA [the General Services Administration] started condemnation proceedings for the land. I had to write up a specification for the development of a design for the plant. That is, what was to go into the plant, how many antennae we needed, what their bearings should be—I had to work with [VOA engineer] George Jacobs on this—frequencies and bearings needed for specific antennae.

The VOA negotiated with several firms on DeLong's specifications and selected Austin Co. of Cleveland, Ohio to design and engineer the complex (Figure 8). Samuel Austin founded the eponymously named company in Cleveland in 1878 and by the 1910s it had become a major national engineering and construction firm. In the early twentieth century Samuel's son, Wilbert J. Austin, joined the firm and, according to a company history, "conceived the then heretical idea of combining engineering and construction in one firm to offer a complete facility service." This idea, which became known as "The Austin Method," offered "contracts that started with architecture and engineering, and ended with the finished building" (Austin Company 2005).

The Voice of America's new Greenville facilities were examined at dedication ceremonies there Feb. 8. Getting an explanation on some of the equipment from Howard DeLong (l), the Voice's project manager for design of the $23 million system (l to r): Allan S. Austin, president of the firm bearing his name which conceived the Greenville design and engineering; Fred Blackburn, USIA project manager; Richard F. Wittenmyer, manager of Austin engineering and research; and Edward R. Murrow, director of the U. S. Information Agency.

Figure 8: Five of the principal players in the conception, design, and construction of the Greenville Transmitting Station (source: *Broadcasting*, February 18, 1963)

Austin Co. was known for its massive industrial facilities. The aircraft assembly plant it designed and constructed in Buffalo for the Curtiss Aeroplane and Motor Company in 1918, for example, was for a time the world's largest manufacturing plant. A half-century later the company put up, yet again, the world's largest industrial structure, the Boeing Company assembly plant in Everett, Washington (1966-1967) (Austin Company 2005).

Austin Co.'s specialties included broadcasting facilities. According to its website, between 1945 and 1955 the company designed and constructed 50 of the country's first 75 local television stations and numerous facilities for the major American broadcasting networks. Its broadcast design-engineering projects included the radio-television stations for WHIO in Dayton (1948, 1955, 1958), WCAU in Philadelphia (1952), WSB in Atlanta (1953), WEWS in Cleveland (1956), WSYR in Syracuse (1958), WKRC in Cincinnati (1959), WXYZ in Detroit (1959), and WHEN in Syracuse (1963) (West 1964). Austin's experience with these large multi-million dollar facilities certainly contributed to its selection by the VOA.

Austin Co. drew a total of 1,400 "basic blueprints" for the project. These were supplemented by "countless shop drawings to explain details" (Burlington, NC *Times-News*, May 3, 1961).

Ling-Temco Electronics, Inc. and Collins Radio Company received a $12,000,000 contract for the Greenville project from the USIA in November 1960. They formed a joint venture of their Dallas-based subsidiaries—Continental Electronics Manufacturing Company and Alpha Corporation—for constructing the facilities. The venture served as general contractors. A Dallas County newspaper reported on the work following the award (*Daily News-Texan* November 17, 1960):

> Six 500,000-watt transmitters, made by Continental for a previously-awarded contract, six 250,000-watt transmitters and numerous 50- and 10-watt kilowatt transmitters will be installed. The 250,000-watt components are the world's most powerful short-wave transmitters.
>
> The work covered by the new contract includes the erection of antennae and the installation of the transmitters and receiving equipment, plus construction of buildings at three sites on an equal-sided triangle centered on Greenville, N.C.

A March 1961 construction field office sign identified the joint venture as operating under the name "Alpha-Continental" (Figure 9).

Figure 9: Site A field office sign (source: [Greenville] *Daily Reflector*, March 16, 1961)

Alpha-Continental subcontracted by May 1961 with 30 firms, most of which were North Carolina-based. The in-state firms included ones in Charlotte, Greensboro, Raleigh, Winston-Salem, Concord, Greenville, Columbia, Kinston, Salisbury, Wilmington, and New Bern. Republic Steel supplied 3,000 tons of shop-welded sections for the steel antenna towers and approximately 1,000 tons of reinforcing bars for their foundations. This steel was produced by the company's Truscon Division in Charlotte (Burlington, NC *Times-News*, May 3, 1961; Massillon, OH *Evening Independent*, August 24, 1963).

Apparently all three sites were cleared at the same time. The first step was clearing trees, which were converted into boards at portable sawmills located on the sites. Black and white work crews engaged in this effort. The ground was then graded, access roads to the buildings and antenna sites were carved, and construction could commence (Figure 10 and Figure 11).

Figure 10. Hauling trees and milling boards at VOA Site A, B, or C, ca. 1960 (source: VOA progress photographs file)

Figure 11. Aerial view of Site C cleared and ready for construction, March 2, 1961 (source: Greenville, NC *Daily Reflector*, May 3, 1961)

IV. HISTORIC AND CURRENT ARCHITECTURAL DESCRIPTION AND CONTEXT

Introduction

Sites A and B of the Greenville Transmitting Station complex were built with identical main transmission buildings, switchbays, guardhouses, parking lots, and even immediate landscaping and drives. The descriptions of the resources at Site A, therefore, also describe the same resources at Site B. Minor subsidiary features, such as pumphouses and culverts, vary slightly according to the particular landforms and hydraulic features of each site. The layouts of the antenna fields at the two sites are also different, due to both site and transmission considerations. The descriptions of these resources at Site A are accordingly particular to that site.

Due to safety and environmental concerns, it was decided during the initial photographic recordation of this project to take *interior* photographs of Site B rather than Site A. Descriptions of interior spaces and equipment are therefore of Site B, although they would largely apply to Site A as well. Exterior, subsidiary resource, and antenna field photographs, however, are all of Site A.

Photo logs, photo angle maps, and 97 photographs were included in the photographic recordation submission. The logs, maps, and reduced-scale versions of the photographs are appended to this report. Full-scale images and pdfs of these images are on file at the North Carolina State Historic Preservation Office (HPO) in Raleigh. Some of these images are included in the body of this report, but the reader should refer to the appendix and the HPO files for more complete imagery.

Ten principal resources are located at Site A: the transmitter building [A on Figure 12], switchbay [B], guardhouse [C], well pumphouses 1, 2 and 3 [D, E and H], power substation [F], water storage building and reservoir [G], generator building and fuel tank [I], and satellite array or antenna field [J]. Extensive exterior images of the resources at Site A and interior images of the resources at Site B are included in the photographic recordation submission. Therefore, where possible historic images are included below, as the recordation submission provides a modern photographic record.

Contextually, there are a limited number of resources to which Site A can be compared, as it is so massive, diverse, and significant. The Voice of America Bethany Relay Station in Butler County, Ohio was NRHP-listed in 2006 under the areas of significance of communications, engineering, and politics/government. It is a much smaller facility than Site A and its companion sites. Built in 1944, at its peak it had three transmitters broadcasting with 250 kW, three broadcasting with 175 kW, and two transmitting with 50 kW. It was closed in 1994 and its towers were demolished from December 1997 through February 1998 (Figure 3, above).

The VOA Lualualei antenna system, west of Honolulu, Hawaii, was recommended as NRHP-eligible in 2009. The ruinous transmitting station with which it was associated was not (Reith 2009:40) (Figure 5, above).

The North Carolina HPO placed VOA Site C (PT-1726) in Pitt County on its Study List of resources that are potentially eligible for NRHP listing in 1997. In 2017 it added VOA Site B (PT-2257), also in Pitt County, to the Study List.

Figure 12. Site A resources map

Transmitter building [A on Figure 12*]*

The transmitter building is one and two stories tall. The first story includes offices, shops, a garage and warehouse, the central control room, a tank and pump room, a power distribution room, and rooms and corridors lined with transmission equipment. A second story over part of the building holds mechanical equipment necessary to service the equipment below. A winding stair climbs a tall rectangular tower that opens into a window-lined observation room (Figure 13).

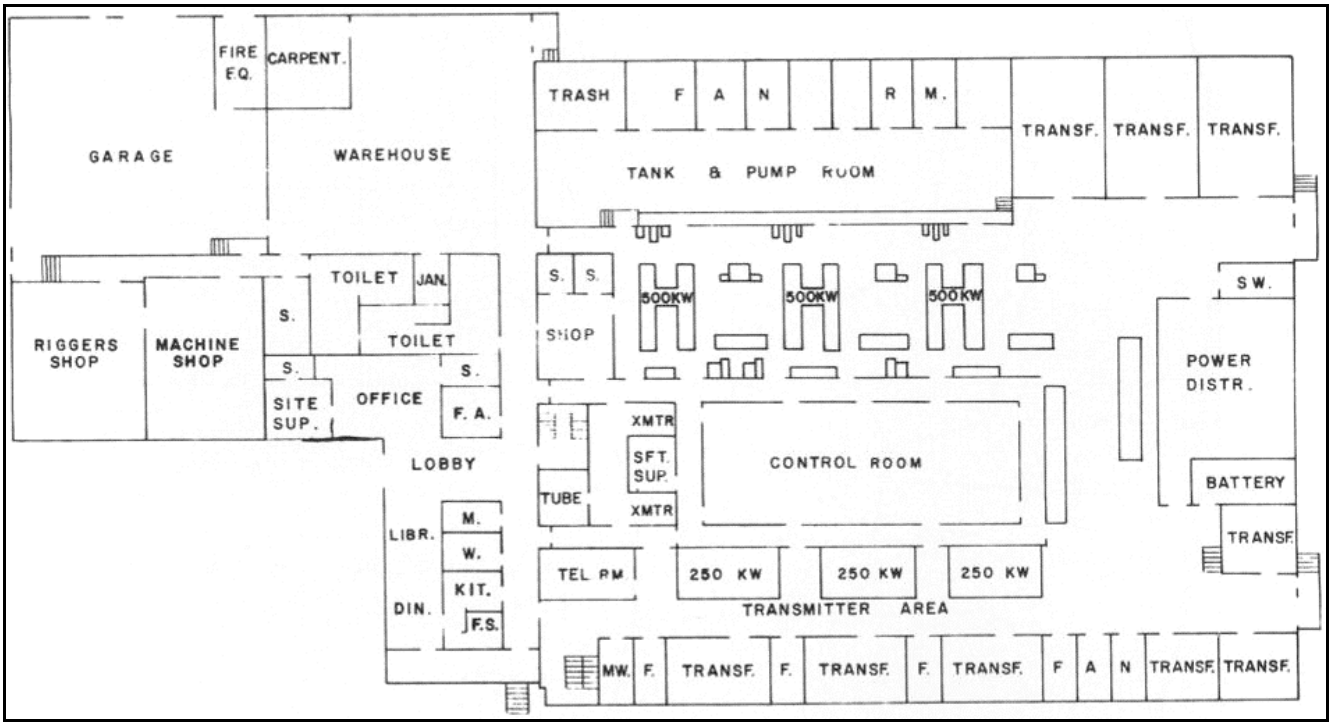


Figure 13. Sites A and B transmitter building floor plan (source: Rhine 1968)

Steel and concrete block form the flat-roofed building's body. It is clad in limestone panels, aluminum, brick, and exposed concrete block (Figure 14). The design is relatively straightforward, driven more by function than aesthetics, although the choice of cladding does in part indicate the use of interior space.

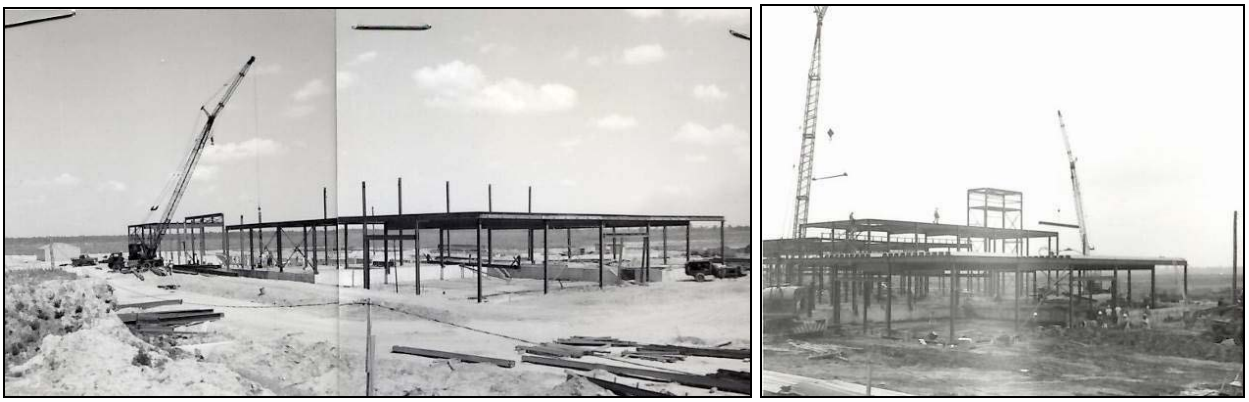


Figure 14. Putting up the steel frame of Site A transmitter building, June 14, 1961, at left, and June 28, 1962, at right (source: VOA progress photographs file)

A one-story block projects out from the left-hand side of the west-facing front elevation. It holds a garage, warehouse, former riggers shop, machine shop, bathrooms, and a reception office (see upper left of Figure 12). Its exterior cladding and finish reflects its interior spaces. Its south elevation, which faces the principal entry and public space, is clad in brick and large limestone panels with ground-level plate-glass windows that light office space. Its east and north elevations—behind which are the shops, garage, and warehouse—are covered with brick only pierced at the ground level by service entrance and garage doors. A band of windows rings the

tops of the two elevations, providing natural light to the hands-on working rooms. A band of limestone panels above the windows at the roofline is its sole aesthetic treatment (Figure 15 and Figure 16).

Figure 15. South elevation of one-story block, at left, and similar view of December 20, 1961, at right (both Site A) (source: VOA progress photographs file)

Figure 16. North elevation of one-story block (Site A), at left, and interior of garage with high banded windows (Site B), at right

The building's public spaces—a lobby, a former library now used as an office, two small bathrooms, and associated spaces—are nestled in the front block's southwest corner (Figure 13, bottom left). The prominence of these spaces is evidenced by their location and relatively elaborate exterior finish (Figure 17 through Figure 20). A floating stair climbs up to the lobby doors, which are flanked by recessed brick walls pierced by plate-glass windows. The lobby is positioned facing the site's entry drive. A long second-story that is cantilevered over this portion of the building is carefully finished. Its side walls are sheathed in limestone panels and its west front wall is punctuated by vertical aluminum "fins," as construction photographs call them. Behind the fins are walls of louvers that expose the prosaic function of the upper story, which holds only mechanical equipment.

Figure 17. West front and south side elevations of transmitter building, at left, and same view of April 18, 1962 (both site A) (source: VOA progress photographs file)

Figure 18. South side elevation of transmitter building, at left, and similar view of May 31, 1962, showing replacement of storm-damaged facing stone (both Site A) (source: VOA progress photographs file)

Figure 19. East front elevation of transmitter building with aluminum fins at cantilevered upper story, at left, and floating stair and lobby, at right (both Site A)

Figure 20. Lobby with terrazzo floors in place (Site B)

The front sections of the building gave the architects the opportunity to express the Modernist architectural style in an otherwise functional design. The two sections, supported by the rear part of the building to a lesser extent, incorporate the key elements of the style. They are rectangular, flat-roofed forms with low horizontal massing and limited ornamentation, which utilize ribbon windows, a plate glass entryway, and a cantilevered projection. On the whole, the transmitter building is characterized by the overarching hallmarks of Modernism—clean lines, simple geometric shapes, and cubic forms.

The functional heart of the building that extends to the east rear of the two front sections is finished in exceeding practical fashion. It is raised on a brick foundation and sided by vertical aluminum panels. Ground-level, horizontal, aluminum louvers provide the only visual relief to these sections of the building. Inside, its walls are largely exposed concrete block and its ceilings exposed metal frames crisscrossed with ventilation ducts.

The south side elevation of the rear section holds a tall rectangular observation tower at its west front. Aluminum panels stripe the tower and bands of windows extend across the top of its four elevations (Figure 21). The observation room holds a concrete floor, wire-strengthened windows, and a grip for directing the searchlight that still remains on the roof (Figure 22). Observation was required to spot mechanical and electrical problems out in the antenna field, as well as any fires.

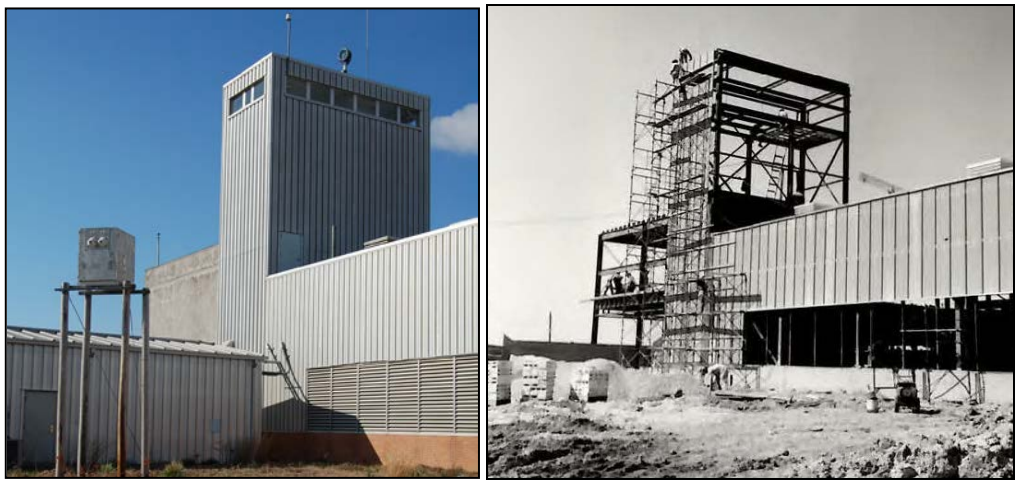


Figure 21. Looking northwest at observation tower and south side of transmitter building (Site A), at left; same view showing installing of insulation and aluminum wall panels, October 6, 1961 (Site B), at right (source: VOA progress photographs file)

Figure 22. Tower observation room with hanging grip for searchlight (Site B)

Louvers are set into the south side of the rear section. These are necessary to help ventilate the heat from the transformer power vaults standing inside along that wall (Figure 21 and Figure 23).

Figure 23. Transformer power vaults along south side of building; note louvered ventilators (Site B)

The north side of the building's rear section is treated the same way as the south. Louvers extending along its wall help cool the transformer power vaults and the fans that serve the tank and pump room (Figure 24 and Figure 25).

Figure 24. Louvered north side of building (Site A), at left, and transformer power vaults with louvers opening to north (Site B), at right

Figure 25. Tank and pump room on north side of building, at left, with doors leading to fan rooms; fan room and fan with louvers at exterior wall, at right (both Site B)

Hidden from outside view are the rooms at the center of the building's rear section. These include the control room, an office, and the north and south transmitter halls. A platform in the control room lifts the control dais and its console a few steps above floor level. This affords those working at the console views of switching equipment to the west and, through glass partition walls, a clear sightline to the transmitters and associated equipment in the north and south transmitter halls (Figure 26 and Figure 27).

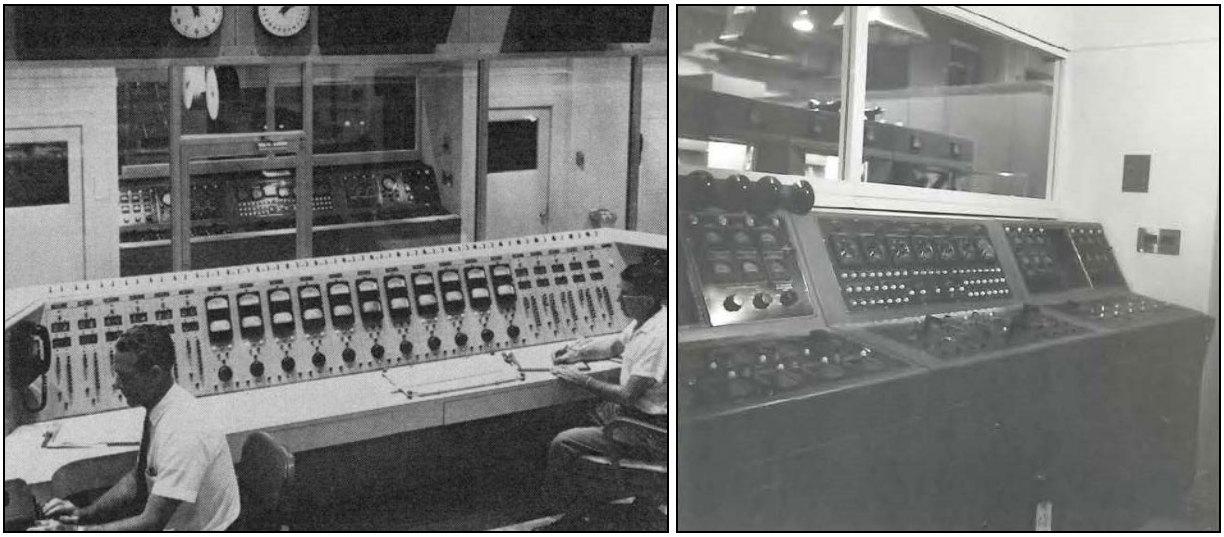


Figure 26. Main transmitter control console, June 1968 (Site A), at left (source: Rhine 1968:52); console panel with newly completed metal and glass partition (Site B), at right, September 14, 1962 (source: VOA progress photographs file)

Figure 27. At left, looking east past switching equipment to control dais; at right, main console beyond which is the north transmitter hall (both Site B)

The north transmitter hall holds three 500kW transmitters and their associated consoles and equipment (Figure 28 and Figure 29). The south transmitter hall holds five transmitters, including three of 250kW, and associated consoles and equipment (Figure 30). Both halls are strictly functional, unadorned spaces.

Figure 28. North transmittal hall, 500 kW transmitter (Site B), at left; north transmittal hall with floor ducts open (Site A), April 23, 1962, at right (source: VOA progress photographs file)

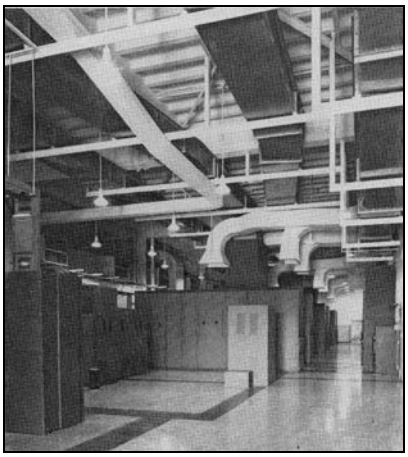


Figure 29. North transmittal hall with exposed ceiling and ducts and 500kW transmitters (Site A) (source: Rhine 1968:52)

Figure 30. South transmittal hall, console for 250kW transmitter, at left, and the transmitter, at right (both Site B)

The east rear elevation of the back section of the transmitter building is also raised on a brick foundation, sided with vertical aluminum panels, pierced by aluminum louvers and plainly fitted out. The louvers provide ventilation for the power distribution room at the building's rear (Figure 29 and Figure 31).

Figure 31. East rear elevation of transmitter building with ground-level louvers (Site A), at left, that ventilate the power distribution room (Site B), at right

Switchbay [B]

To the east rear of the transmitter building stands the switchbay building (Figure 32 and Figure 33). Freestanding, it is nonetheless closely connected by numerous input conduits, supported by X-braces, which run between the two buildings. The switchbay is a one-room metal shell, about 75' wide and 150' deep, with a dirt floor and elevated conduits. The inputs from the transmitter building are separated in the switchbay and fed out by lines to the antenna field.

Figure 32. South side and west front elevations of switchbay connected to east rear of transmitter building by input conduits; same view, at right, including visitors from Fort Bragg War College, April 28, 1962 (both Site A) (source: VOA progress photographs file)

Figure 33. Interior of switchbay in 2012 showing dirt floor, metal walls, and elevated conduits (Site B) (source: Witherspoon 2012)

Guardhouse [C]

The guardhouse is a small-scale Modernist building. An unadorned box, it has a brick foundation and walls, expanses of plate glass, exposed aluminum cladding, and a widely overhanging, flat roof (Figure 34 and Figure 35).

Figure 34. Site A guardhouse under construction, February 20, 1962 (source: VOA progress photographs file)

Figure 35. Looking northwest at guardhouse, at left, and building nearing completion, September 12, 1962, at right (both Site A) (source: VOA progress photographs file)

Well pumphouses 1, 2 and 3 [D, E and H]

The three pumphouses are square, brick-veneered, concrete-block boxes. Aluminum coping edges their flat roofs, which are pierced by an aluminum hatch. One door opens into each; one square louver at the top of the wall opposite the door ventilates them (Figure 36 and Figure 37).

Figure 36. Installing well pumphouse 1, May 15, 1962 (source: VOA progress photographs file), at left; well pumphouse 1 and power substation, at right (both Site A)

Figure 37. At left, well pumphouse 3; at right (from left to right), well pumphouse 2, generator building, and switchbay and transmitter building (both Site A)

Power substation [F]

Due to the need for tremendous amounts of reliable power, the VOA constructed individual outdoor power substations—each served by a different provider to provide redundancy—at Sites A and B. (In 2012 VOA chief engineer Macon Dail said the power bill for Site B was about $700,000 a year, down from highs that had exceeded $2,000,000 a year (Witherspoon 2012) (Figure 38).

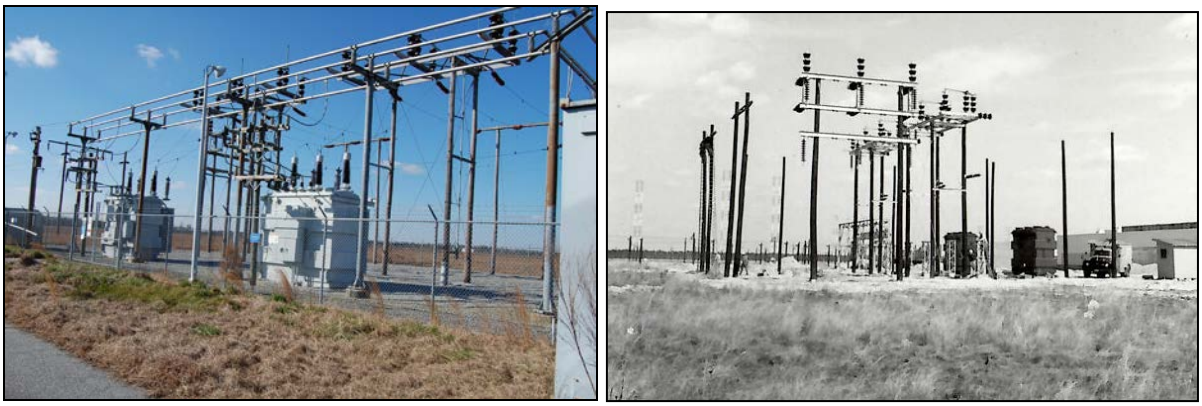


Figure 38. Electrical power transformers, insulators, bus bars, lines, and other components at outdoor power substation, at left; substation construction, April 16, 1962 (both Site A)

Water storage building and reservoir [G]

The water storage building matches the well pumphouses in design. It has brick-veneered walls and a flat roof edged by aluminum coping. Inside it has raw concrete-block walls, a concrete floor, a drinking water storage tank, and pumps. The connected concrete reservoir is largely hidden by the man-made bank into which it is built (Figure 39 and Figure 40).

Figure 39. At left, looking northeast (from left to right) at brick retaining wall of reservoir, water storage building, and generator building; at right, looking west at generator building and reservoir set in man-made bank (both Site A)

Figure 40. Water tank and, at right, pumps in water storage building (Site A)

Generator building and fuel tanks [I]

The generator building is fashioned like the well pumphouses and water storage building, with brick-veneered walls, a concrete-block body, and a flat roof with aluminum coping. Larger than those buildings, it has multiple doorways and a band of windows. It holds a large, original generator. Just to its east is a rectangular, concrete fuel tank (Figure 41).

Figure 41. At left, brick generator building and concrete fuel tank; at right, original Chicago Pneumatic Tool Company generator in building

Satellite array [J]

A 2012 article in radio enthusiast publication the *Monitoring Times* recorded a tour of Site B as "nothing short of jaw-dropping." Of the antenna field, it wrote: "The antennae are so incomprehensibly immense that even the photos we took fail to convey their enormity; there are no trees, no buildings, no vehicles—indeed, the only thing I could find for scale were deer, herds of them, running and leaping beneath" (Witherspoon 2012). Numbers can be provided for the satellite array's acreage and the types and heights of its antennae, but like photographs, they fail to do it justice. To supplement the following description, the reader is referred to the photographic recordation of the antenna field, keyed to a site map, that accompanies this report.

Each broadcast for the transmissions the antennae made travelled a long route before reaching them out in the antenna field. The broadcast was recorded in Washington, transmitted to VOA Site C just outside of Greenville, then transmitted to Site A or B. At one of those sites the broadcast passed from the transmission building to the switchbay and then finally out to the antennae via transmission line poles (Figure 42 and Figure 43).

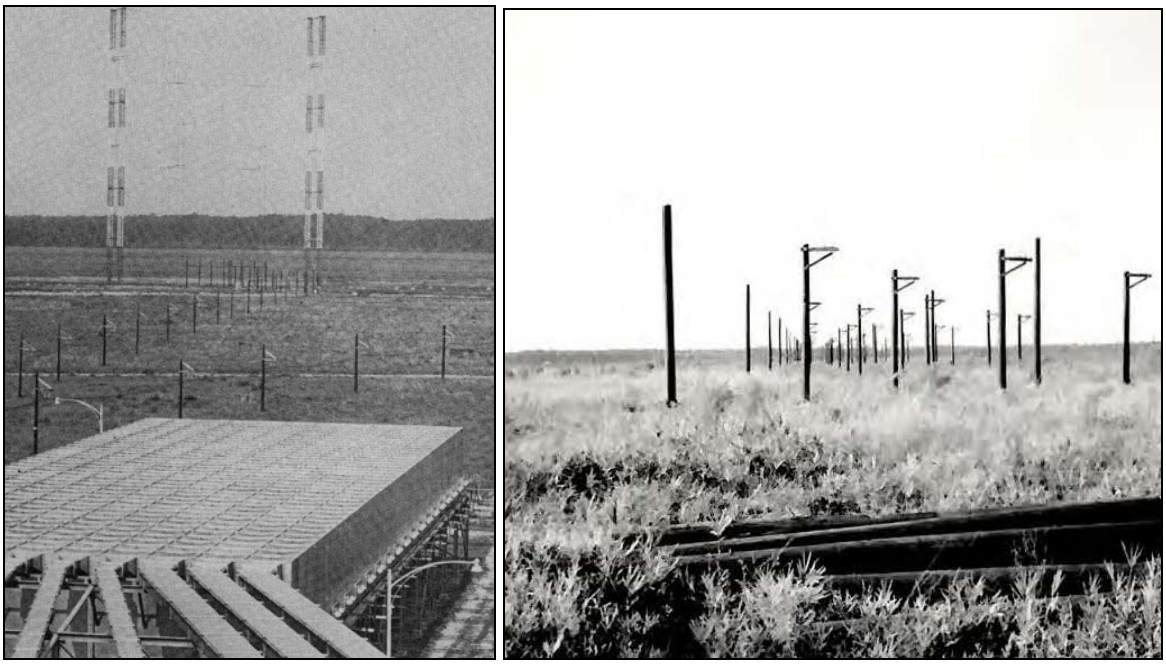


Figure 42. Switchbay, transmission line poles, and curtain antenna (Site A), at left (source: Rhine 1968:53); transmission line poles with crossarms newly installed, October 26, 1961 (Site B), at right (source: VOA progress photographs file)

Figure 43. Site A antenna field with transmission building and switchbay in foreground (source: Rhine 1968:53)

The antennae at Site A are arrayed along three unpaved service roads that form a rough triangle around the transmitter building and its associated resources. In 1968, as shown at Figure 44, the Site A field held 38 antennae. One was an experimental antenna, two were log periodic antennae, 14 were curtain antennae, and 21 were rhombic antennae. In 2016 only five of the antennae were no longer extant, as marked by blue "X" s on the figure. One of the log periodic antennae was gone, as were three of the rhombic antennae and the experimental antenna. In the interim, three new antennae, marked in blue on the figure, had been erected.

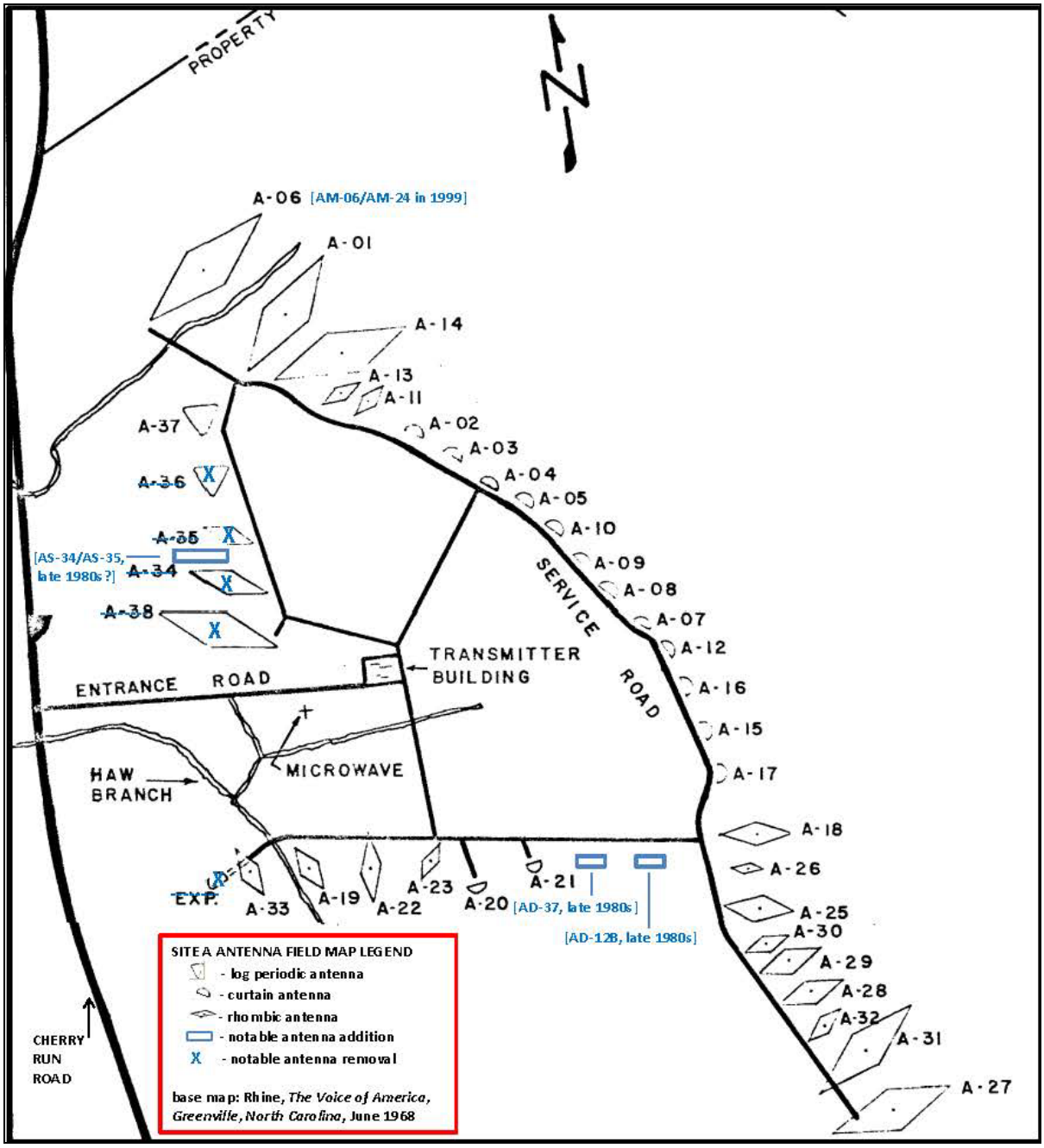


Figure 44. Map of Site A antenna field in 1968, updated in 2016 (base map: Rhine)

A rhombic antenna—the most common type at Sites A and B—is supported by a tower at each of its four equal-length sides. Up to three parallel wires are suspended above the ground between the four towers in a rhombic (that is, an equilateral parallelogram or diamond) shape. A rhombic antenna at the scale of those built for the VOA takes up a substantial amount of ground (Laport 1952:315-339) (Figure 45 through Figure 47).

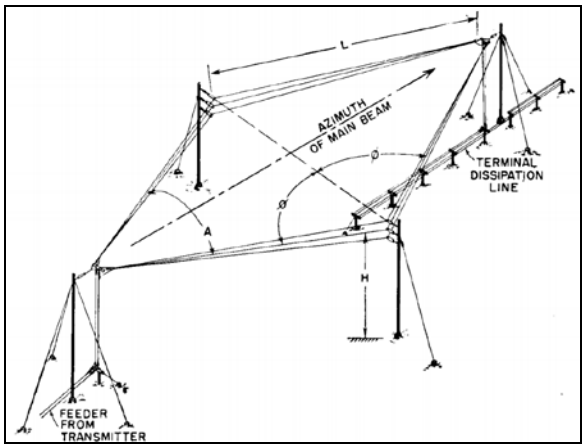


Figure 45. Diagram of a three-wire rhombic antenna; note four towers/poles and equilateral diamond shape (source: Laport 1952:316)

Figure 46. One of the towers of rhombic antenna A-01, at left; field of rhombic antennae along southern section of main service road south of antenna A-17, at right

Figure 47. At left, base plate of one tower of rhombic antenna A-01 on anchor pier (note that tower is not affixed to ground); at right, concrete anchor pier and metal base plate of antenna A-01 with pulley for hauling parts

The second most common type of antenna at Sites A and B was the curtain antenna, which consists of multiple wire dipole antennae strung between tall towers (Griffith 2000:477). (The average curtain antenna is about 300' tall and 240' wide (Witherspoon 2012).) As with the rhombic and log periodic types, the antenna proper is not the substantial soaring towers, but the more diaphanous wires strung between the towers. Curtain antennae are directionally powerful, making them well-suited for the VOA, which targets particular locations to receive its signals (Figure 48 through Figure 51).

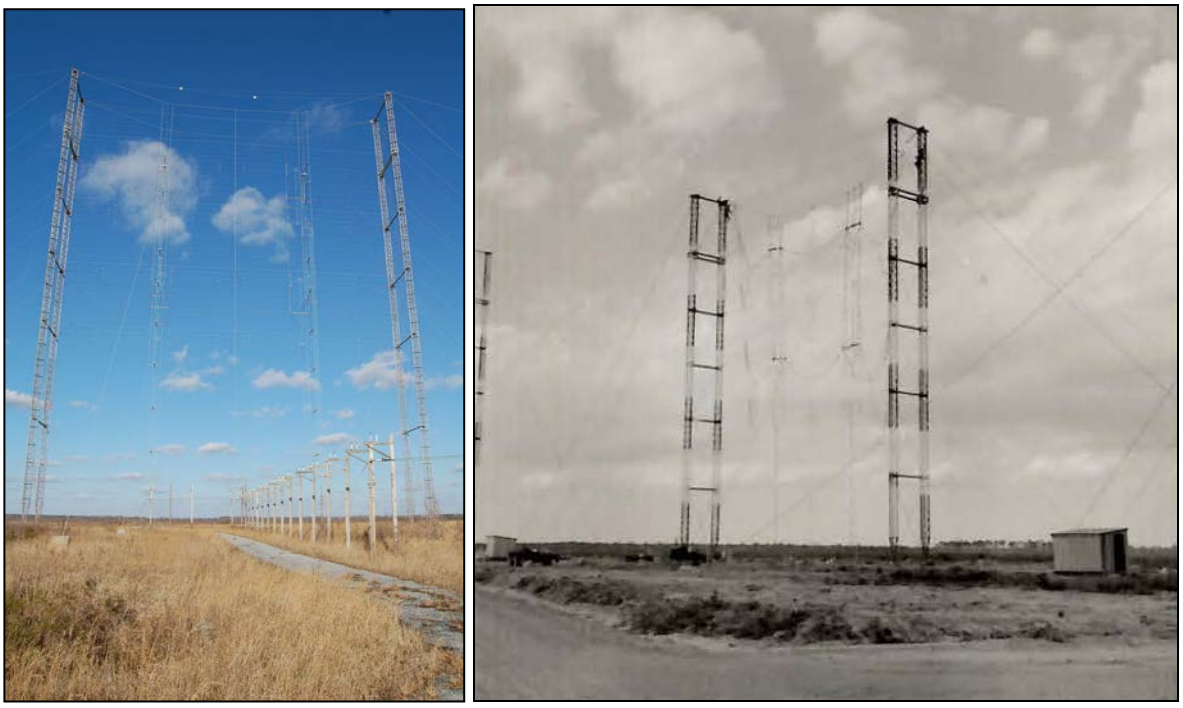


Figure 48. Curtain antenna A-02, at left; curtain antenna H-17 (old numbering system), October 30, 1961, at right (both Site A) (source: VOA progress photographs file)

Figure 49.Curtain antenna A-02 with "curtain" of antenna suspended between pair of towers, at left; multiple curtain antennae southeast of antenna A-02, at right

Figure 50. Curtain antenna A-02 anchor piers and guy wires

Figure 51. Multi-wire, bowtie-like dipoles suspended between towers at curtain antenna A-02, at left; curtain antenna A-07 being set on base plate, September 13, 1961, at right (both Site A) (source: VOA progress photographs file)

A log periodic antenna is a multi-element, directional antenna designed to operate over a wide band of frequencies. The lengths of its multiple elements taper at a logarithmic rate, hence its name. The type was invented shortly before the VOA antennae went up (Sarker et al. 2006:148). Only two were erected at Site A and two at Site B. In 2016 Site A retained just one, the antennae of which are arrayed between six widely spaced towers (Figure 52 and Figure 53).

Figure 52. Log periodic antenna A-37 with, at left, all six support towers visible, three in foreground and three in distance (Site A)

Figure 53. Curtain antenna H-4 (old numbering system) anchor, April 15, 1961, at left (source: VOA progress photographs file); anchor pier at log periodic antenna A-37, at right (both Site A)

A few antennae outside of the above types were added at Site A in the late 1980s. Two that were located in open area west of the bottom run of the service road are dipole antennae (Figure 54). Chosen for technical transmission reasons, as were all of the antennae, these look much like curtain antennae to the non-professional eye.

Figure 54. Dipole antenna AD-12B, at left, and dipole antenna AD-37, at right (both Site A)

Postscript

Between March 28 and April 4, 2016, Controlled Demolition, Inc. (CDI) brought down all of Site A's antennae through a series of carefully calibrated explosions. (This recordation project was developed as part of the mitigation for the removal of the antennae.) As the towers that supported the antennae were not permanently affixed to the ground, but rather stood on rounded base plates resting on concrete piers, they were taken down through the explosive destruction of their guy wires. Without the wires, the 128 steel towers, which ranged in height from 50' to 414' according to CDI, collapsed of their own accord. CDI video-recorded the demolition of the antennae. This five-minute youtube video, titled "Voice of America Radio Towers – Controlled Demolition, Inc.," can be viewed at https://www.youtube.com/watch?v=XR6xc3EW4HA. Via screen captures, some its images are included below (Figure 55).

Figure 55. Screen captures of demolition of Site A antennae, March 28-April 4, 2016 (source: https://www.youtube.com/watch?v=XR6xc3EW4HA)

V. BIBLIOGRAPHY

Austin Company
2005 "History of The Austin Company." Accessed July 2016 at www.theaustin.com/austin-company-history.

Belanger, Brian
2003 "The Voice of America Exhibit." *Radio History Society Radio & Television Museum News.* Vol. 9, No. 3 (September 2003): 1-8. Accessed July 2016 at http://ncrtv.org/wp-content/uploads/DialsChannels/VOL-09-No-3-RHS-Radio-Television-Museum-News-September-2003.pdf.

Broadcasting
1963 "VOA's New Greenville Facility Doubles Voice's Power." February 18, 1963:44-45. Accessed July 2017 at http://www.americanradiohistory.com/Archive-BC/BC-1963/1963-02-18-BC.pdf.

Broadcasting Board of Governors. Website accessed July 2017 at https://www.bbg.gov/networks/.

Dail, Jamie A.
2015 "A Forgotten Voice: Post WWII Communications, Preserving Scientific Heritage." Master's thesis, Savannah College of Art and Design, May 2015.

Daily News-Texan (Grand Prairie, TX)
1960 "Ling-Temco Shares in $12 Million Job." November 17, 1960.

Daily Reflector (Greenville, NC)
1961a Photograph of sign identifying construction site for Voice of America radio facilities. March 16, 1961. Accessed March 2017 at https://digital.lib.ecu.edu/5285.

1961b Aerial photograph of VOA Site C cleared for construction. May 3, 1963. Accessed March 2017 at https://digital.lib.ecu.edu/5335.

DeLong, Howard G.
1989 Interview by C.B. (Cliff) Groce, July 13, 1989. The Association for Diplomatic Studies and Training Foreign Affairs Oral History Project Information Series. Transcript accessed August 2016 at http://www.adst.org/OH%20TOCs/DeLong,%20Howard.toc.pdf.

Douglas, Theo
2014 "Second Act nears for Historic Delano Radio site." Bakersfield *Californian*, March 29, 2014. Accessed August 2016 at http://www.bakersfield.com/news/2014/03/30/second-act-nears-for-historic-delano-radio-site.html.

Evening Independent (Massillon, OH)
1963 "400 Towers are Supplied by Republic." August 24, 1963.

Gates Studio Review
1955 "Gates Equips Largest Studio Installation in the World." August 1955. In-house publication of the Gates Radio Company. Accessed August 2016 at http://gates-harris-history.com/1955-08%20August.pdf.

Griffith, B. Whitfield, Jr.
2000 *Radio Electronic Transmission Fundamentals.* Second edition. Noble Publishing Corporation, Atlanta.

International Broadcasting Bureau
1999 "Greenville Transmitting Station Facilities Handbook." Exhibit H. November 1999. Copy on file at the Edward R. Murrow Transmitting Station.

Laport, Edmund A.
1952 *Radio Antenna Engineering.* McGraw-Hill Book Company, Inc., New York.

Mackenzie, George
2000 "VOA History." Accessed June 2016 at http://permanent.access.gpo.gov/lps13530/history.html.

Office of Inspector General
2005 "The International Broadcasting Bureau's Greenville, North Carolina, Transmitting Station." United States Department of State and the Broadcasting Board of Governors Report of Inspection, Report Number ISP-IB-05-69, August 2005. Accessed June 2016 at https://oig.state.gov/system/files/124642.pdf.

O'Neal, James E.
2014 "VOA Delano Station Goes on the Block." *RadioWorld*, March 10, 2014. Accessed August 2016 at http://www.radioworld.com/article/voa-delano-station-goes-on-the-block/269252.

Owosso (Mich.) *Argus-Press*
1968 "Austin Co. Story Told." September 5, 1968.

Reith, Tim
2009 "An Archaeological Inventory Survey of the Former Voice of America Site, Ma'ili, Lualualei Ahupua'a, Wai'anae District, O'ahu (TMK:(1) 8-7-010:007)." Prepared for Element Environmental, LLC, Haleiwa, Hawaii. Accessed August 2017 at http://www.carrollcox.com/RadioDocs/An_Archaeological_Inventory_Survey_of_th.pdf.

Rhine, F. Wayne
1968 "The Voice of America Greenville, North Carolina." *IEEE Transaction on Broadcasting*, Vol. BC-14, No. 2 (June 1968): 45-54.

Sarker, Tapan K., Robert J. Mailloux, Arthur A. Oliner, Magdalena Salazar-Palma, and Dipak L. Sengupta
2008 *History of Wireless.* John Wiley & Sons, Hoboken, NJ.

Schneider, John
2014 "Dixon, California: A United States Shortwave Mecca." *RadioWorld*, March 10, 2014. Accessed August 2016 at http://www.radioworld.com/article/voa-delano-station-goes-on-the-block/269252.

Times-News (Burlington, NC)
1961 "Voice of America's Station is Biggest Broadcasting Facility." May 3, 1961.

United States Information Agency
c1963 *The Voice of America Doubles its Power: the New Greenville Complex*. Washington: United States Information Agency. Accessed August 2016 at https://digital.lib.ecu.edu/12771#details.

Vepcovian
1963 "Loudest Voice in the World." *The State*, Vol. 31, No. 5 (August 3, 1963): 9-10. Originally published in the magazine of the Virginia Electric and Power Company, the *Vepcovian*. Accessed February 2016 at http://digital.ncdcr.gov/cdm/ref/collection/p16062coll18/id/45839.

VOA progress photographs file. Located at VOA Site B.

Voice of America Museum
2014 "Significant Dates for Bethany Station." Accessed August 2016 at http://www.voamuseum.org/about/bethany-station-time-line/.

2015 "Narrative of History of VOA Bethany." Accessed August 2016 at http://www.voamuseum.org/about/bethany-relay-station-history/.

West, Donald V.
1964 "Television Station Design: Form for the Function." *Television*, Vol. 21, No. 6 (June 1964):1-76. Accessed September 2016 at http://www.americanradiohistory.com/Archive-Television-Magazine/Television-1964-Jun.pdf.

Witherspoon, Thomas
2012 "A Tour of the Edward R. Murrow Transmitting Station. Posted on the "SWLing Post," December 24, 2012. Accessed January 2016 at http://swling.com/blog/2012/12/for-your-holiday-enjoyment-a-tour-of-the-edward-r-murrow-transmitting-station/.

VI. APPENDIX - Photographic Recordation

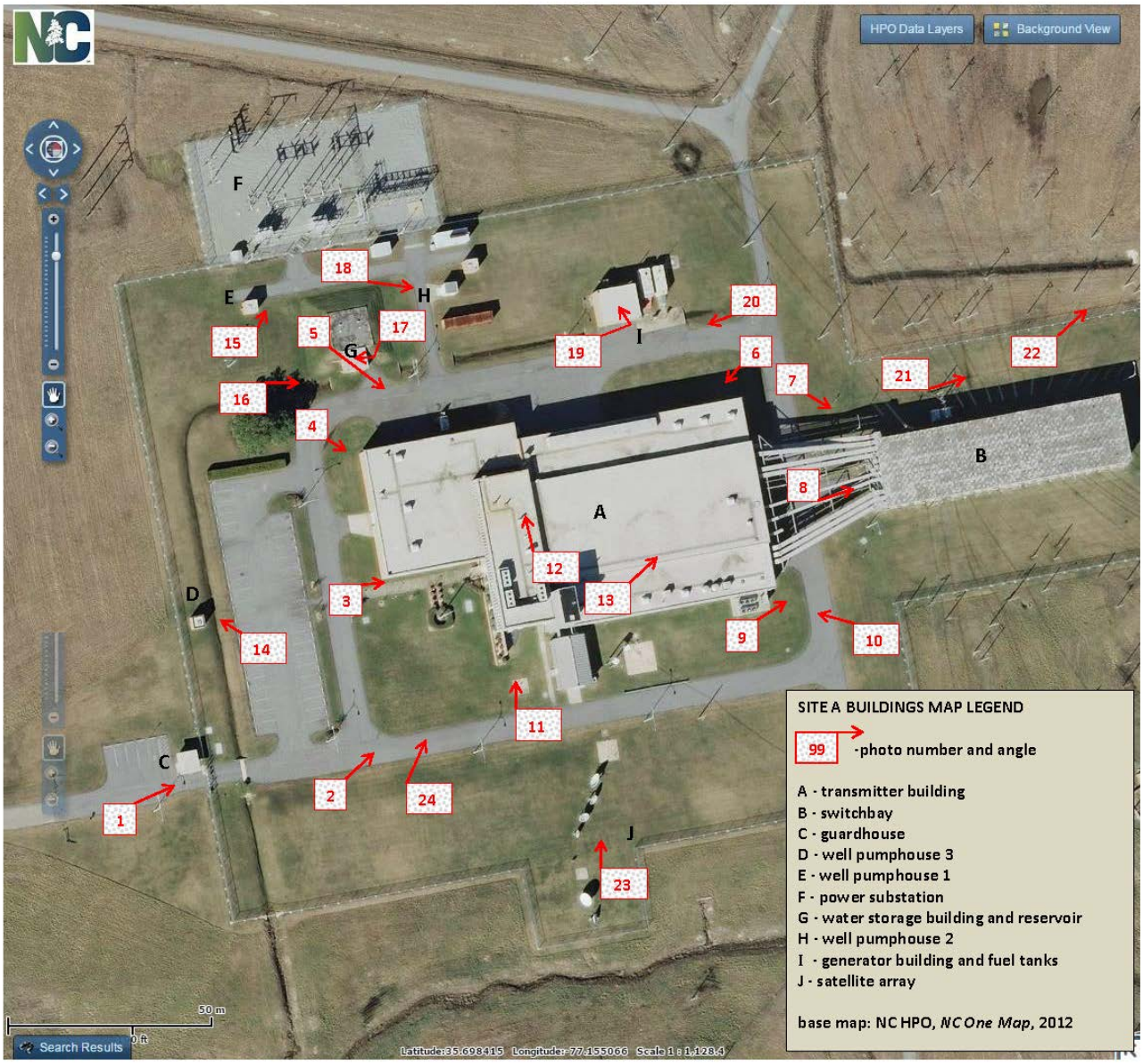
PHOTO LOG
VOICE OF AMERICA SITE A (BF0179)

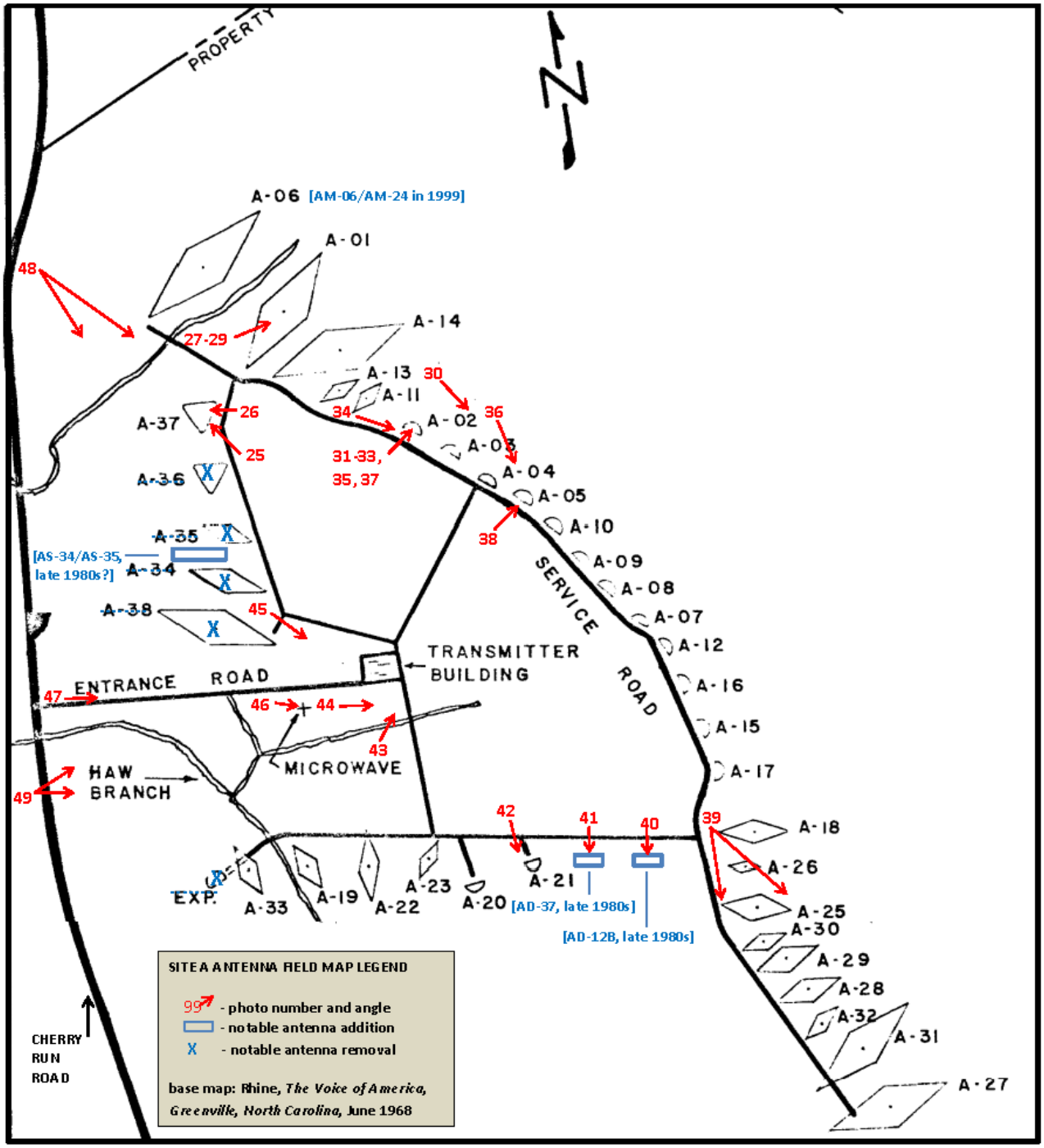
NCDOT Project Number/Environmental Review Number: ER 15-2838
Project Description: Disposal of Voice of America Transmitting Station, Site A, Beaufort County
Survey Site Number and Name of Property: BF0179 / Voice of America Site A exteriors and antenna field
Street Address: 10000 Cherry Run Road
Vicinity or Town: Grimesland
County: Beaufort County
Photographer's Name and Date of Photography: Marvin A. Brown – February 5, 2016

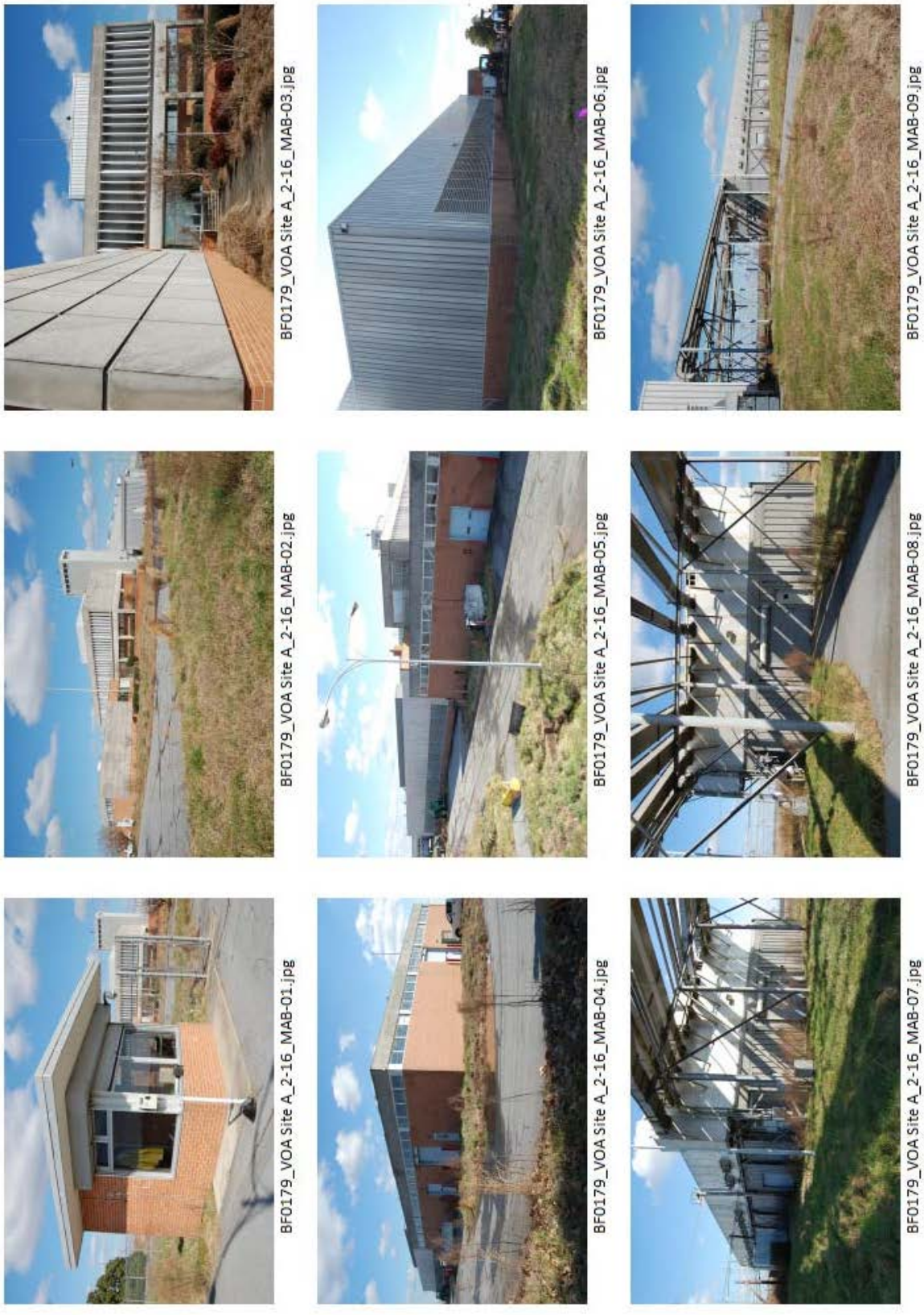
Photo ID Number	Description
BF0179_VOA Site A_2-16_MAB-01.pdf	Guardhouse and transmitter building beyond, looking NE
BF0179_VOA Site A_2-16_MAB-02.pdf	Transmitter building, W front and S side elevations
BF0179_VOA Site A_2-16_MAB-03.pdf	Transmitter building, W front elevation and main entrance
BF0179_VOA Site A_2-16_MAB-04.pdf	Transmitter building, W front and N side elevations
BF0179_VOA Site A_2-16_MAB-05.pdf	Transmitter building, N side elevation
BF0179_VOA Site A_2-16_MAB-06.pdf	Transmitter building, N side and E rear elevations
BF0179_VOA Site A_2-16_MAB-07.pdf	Switchbay, N side and W front elevations
BF0179_VOA Site A_2-16_MAB-08.pdf	Switchbay, W front elevation
BF0179_VOA Site A_2-16_MAB-09.pdf	Switchbay, S side and W front elevations
BF0179_VOA Site A_2-16_MAB-10.pdf	Transmitter building, E rear and S side elevations
BF0179_VOA Site A_2-16_MAB-11.pdf	Transmitter building, S side elevation
BF0179_VOA Site A_2-16_MAB-12.pdf	Looking N from transmitter building tower at power substation and antenna field beyond
BF0179_VOA Site A_2-16_MAB-13.pdf	Looking NW from transmitter building tower at switchbay and curtain antennas beyond
BF0179_VOA Site A_2-16_MAB-14.pdf	Well pumphouse 3, looking NE from parking lot
BF0179_VOA Site A_2-16_MAB-15.pdf	Looking N at well pumphouse 1 and power substation
BF0179_VOA Site A_2-16_MAB-16.pdf	Looking E at concrete culvert, water storage building and reservoir with generator building in distance
BF0179_VOA Site A_2-16_MAB-17.pdf	Drinking-water tank and pumps in water storage building
BF0179_VOA Site A_2-16_MAB-18.pdf	Looking E at well pumphouse 2 at left and generator building at center
BF0179_VOA Site A_2-16_MAB-19.pdf	Chicago Pneumatic Tool Company generator in generator building
BF0179_VOA Site A_2-16_MAB-20.pdf	Looking W at generator building and pair of aboveground concrete fuel tanks
BF0179_VOA Site A_2-16_MAB-21.pdf	Looking E at transmission lines extending from switchbay to antenna field
BF0179_VOA Site A_2-16_MAB-22.pdf	Looking NE at transmission lines and poles from N of switchbay
BF0179_VOA Site A_2-16_MAB-23.pdf	Looking N at receive-only satellite array and S side of transmitter building
BF0179_VOA Site A_2-16_MAB-24.pdf	Transmitter building, S side and W front elevations

1

Photo ID Number	Description
BF0179_VOA Site A_2-16_MAB-25.pdf	Log periodic antenna A-37 with all six support towers visible, three in foreground and three in background
BF0179_VOA Site A_2-16_MAB-26.pdf	Log periodic antenna A-37 anchor pier at right and base of support tower at left
BF0179_VOA Site A_2-16_MAB-27.pdf	Rhombic antenna A-1, view up support tower
BF0179_VOA Site A_2-16_MAB-28.pdf	Rhombic antenna A-1, base plate on anchor pier
BF0179_VOA Site A_2-16_MAB-29.pdf	Rhombic antenna A-1, bottom of support tower with pulley for hauling equipment at left and incoming transmission line at right
BF0179_VOA Site A_2-16_MAB-30.pdf	Looking SE at curtain antennas A-2, A-3 and A-4
BF0179_VOA Site A_2-16_MAB-31.pdf	Curtain antenna A-2
BF0179_VOA Site A_2-16_MAB-32.pdf	Curtain antenna A-2: note multi-wire bowtie-like dipoles and curtain-like reflector of multiple parallel horizontal wires
BF0179_VOA Site A_2-16_MAB-33.pdf	Curtain antenna A-2
BF0179_VOA Site A_2-16_MAB-34.pdf	Looking SE from curtain antenna A-2 at support towers and, at right, transmission line poles with lines removed
BF0179_VOA Site A_2-16_MAB-35.pdf	Curtain antenna A-2 anchor piers
BF0179_VOA Site A_2-16_MAB-36.pdf	Looking SE from near curtain antenna A-2 at multiple curtain antennas
BF0179_VOA Site A_2-16_MAB-37.pdf	Curtain antenna A-2, close-up of multi-wire bowtie-like dipoles
BF0179_VOA Site A_2-16_MAB-38.pdf	Curtain antenna A-5
BF0179_VOA Site A_2-16_MAB-39.pdf	Looking at rhombic antennas SE of rhombic antenna A-18
BF0179_VOA Site A_2-16_MAB-40.pdf	Dipole antenna AD-12B, erected late 1980s
BF0179_VOA Site A_2-16_MAB-41.pdf	Dipole antenna AD-37, erected late 1980s
BF0179_VOA Site A_2-16_MAB-42.pdf	Curtain antenna A-21
BF0179_VOA Site A_2-16_MAB-43.pdf	Looking N from antenna field at transmitter building at left and switchbay at right
BF0179_VOA Site A_2-16_MAB-44.pdf	Looking E from near microwave tower at antenna field
BF0179_VOA Site A_2-16_MAB-45.pdf	Looking SE from near site of former rhombic antenna A-38 at transmitter building at right and power substation at left
BF0179_VOA Site A_2-16_MAB-46.pdf	Microwave tower
BF0179_VOA Site A_2-16_MAB-47.pdf	Looking E from beginning of entrance road at Cherry Run Road at transmitter building and antenna field
BF0179_VOA Site A_2-16_MAB-48.pdf	Looking SE from Cherry Run Road north of entrance road at antenna field and transmitter building
BF0179_VOA Site A_2-16_MAB-49.pdf	Looking NE from Cherry Run Road south of entrance road at antenna field and transmitter building


HPO Data Layers
Background View
F
E
H
G
I
A
B
C
D
J
18
15
5
17
19
20
6
7
21
22
16
4
8
12
13
3
9
10
14
11
2
24
1
23
SITE A BUILDINGS MAP LEGEND
99 -photo number and angle
A - transmitter building
B - switchbay
C - guardhouse
D - well pumphouse 3
E - well pumphouse 1
F - power substation
G - water storage building and reservoir
H - well pumphouse 2
I - generator building and fuel tanks
J - satellite array
base map: NC HPO, NC One Map, 2012
50 m
Search Results
Latitude:35.698415 Longitude:-77.155066 Scale 1 : 1,128.4


PROPERTY
N
A-06 [AM-06/AM-24 in 1999]
A-01
48
A-14
27-29
A-13
30
A-11
A-37
26
34
A-02
36
25
31-33,
35, 37
A-03
A-04
A-36
A-05
A-10
A-35
38
[AS-34/AS-35,
late 1980s?]
A-34
A-09
SERVICE
A-08
A-38
45
A-07
A-12
TRANSMITTER
BUILDING
ROAD
A-16
47
ENTRANCE
ROAD
46
44
A-15
43
A-17
MICROWAVE
HAW
BRANCH
49
42
41
40
39
A-18
A-26
EXP.
A-33
A-19
A-22
A-23
A-20
A-21
[AD-37, late 1980s]
[AD-12B, late 1980s]
A-25
A-30
A-29
A-28
A-32
A-31
A-27
SITE A ANTENNA FIELD MAP LEGEND
99 - photo number and angle
- notable antenna addition
X - notable antenna removal
base map: Rhine, The Voice of America, Greenville, North Carolina, June 1968
CHERRY
RUN
ROAD


BF0179_VOA Site A_2-16_MAB-03.jpg
BF0179_VOA Site A_2-16_MAB-06.jpg
BF0179_VOA Site A_2-16_MAB-09.jpg
BF0179_VOA Site A_2-16_MAB-02.jpg
BF0179_VOA Site A_2-16_MAB-05.jpg
BF0179_VOA Site A_2-16_MAB-08.jpg
BF0179_VOA Site A_2-16_MAB-01.jpg
BF0179_VOA Site A_2-16_MAB-04.jpg
BF0179_VOA Site A_2-16_MAB-07.jpg
1 / 6


BF0179_VOA Site A_2-16_MAB-12.jpg
BF0179_VOA Site A_2-16_MAB-15.jpg
BF0179_VOA Site A_2-16_MAB-18.jpg
BF0179_VOA Site A_2-16_MAB-11.jpg
BF0179_VOA Site A_2-16_MAB-14.jpg
BF0179_VOA Site A_2-16_MAB-17.jpg
BF0179_VOA Site A_2-16_MAB-10.jpg
BF0179_VOA Site A_2-16_MAB-13.jpg
BF0179_VOA Site A_2-16_MAB-16.jpg
2 / 6

BF0179_VOA Site A_2-16_MAB-21.jpg

BF0179_VOA Site A_2-16_MAB-24.jpg

BF0179_VOA Site A_2-16_MAB-27.jpg

BF0179_VOA Site A_2-16_MAB-20.jpg

BF0179_VOA Site A_2-16_MAB-23.jpg

BF0179_VOA Site A_2-16_MAB-26.jpg

3 / 6

BF0179_VOA Site A_2-16_MAB-19.jpg

BF0179_VOA Site A_2-16_MAB-22.jpg

BF0179_VOA Site A_2-16_MAB-25.jpg

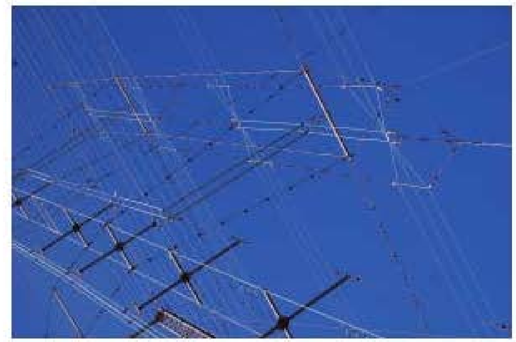
BF0179_VOA Site A_2-16_MAB-28.jpg

BF0179_VOA Site A_2-16_MAB-29.jpg

BF0179_VOA Site A_2-16_MAB-30.jpg

BF0179_VOA Site A_2-16_MAB-31.jpg

BF0179_VOA Site A_2-16_MAB-32.jpg



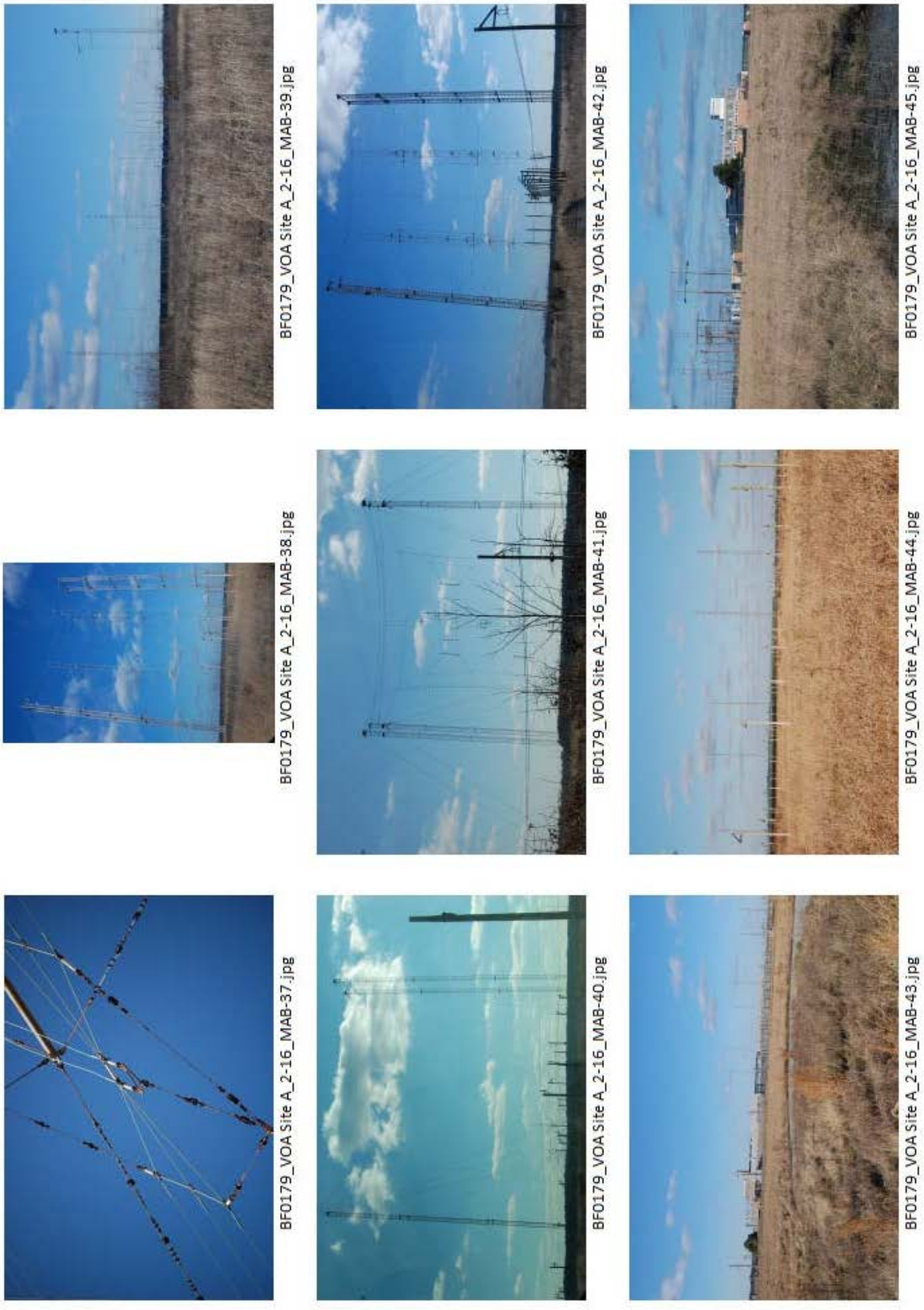
BF0179_VOA Site A_2-16_MAB-33.jpg

BF0179_VOA Site A_2-16_MAB-34.jpg

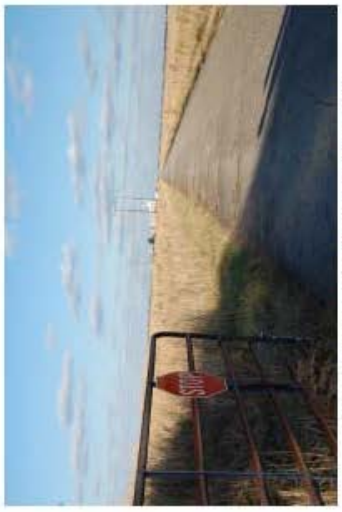
BF0179_VOA Site A_2-16_MAB-35.jpg

BF0179_VOA Site A_2-16_MAB-36.jpg

4 / 6


BF0179_VOA Site A_2-16_MAB-39.jpg
BF0179_VOA Site A_2-16_MAB-42.jpg
BF0179_VOA Site A_2-16_MAB-45.jpg
BF0179_VOA Site A_2-16_MAB-38.jpg
BF0179_VOA Site A_2-16_MAB-41.jpg
BF0179_VOA Site A_2-16_MAB-44.jpg
BF0179_VOA Site A_2-16_MAB-37.jpg
BF0179_VOA Site A_2-16_MAB-40.jpg
BF0179_VOA Site A_2-16_MAB-43.jpg
5 / 6

BF0179_VOA Site A_2-16_MAB-48.jpg



BF0179_VOA Site A_2-16_MAB-47.jpg

BF0179_VOA Site A_2-16_MAB-46.jpg

BF0179_VOA Site A_2-16_MAB-49.jpg

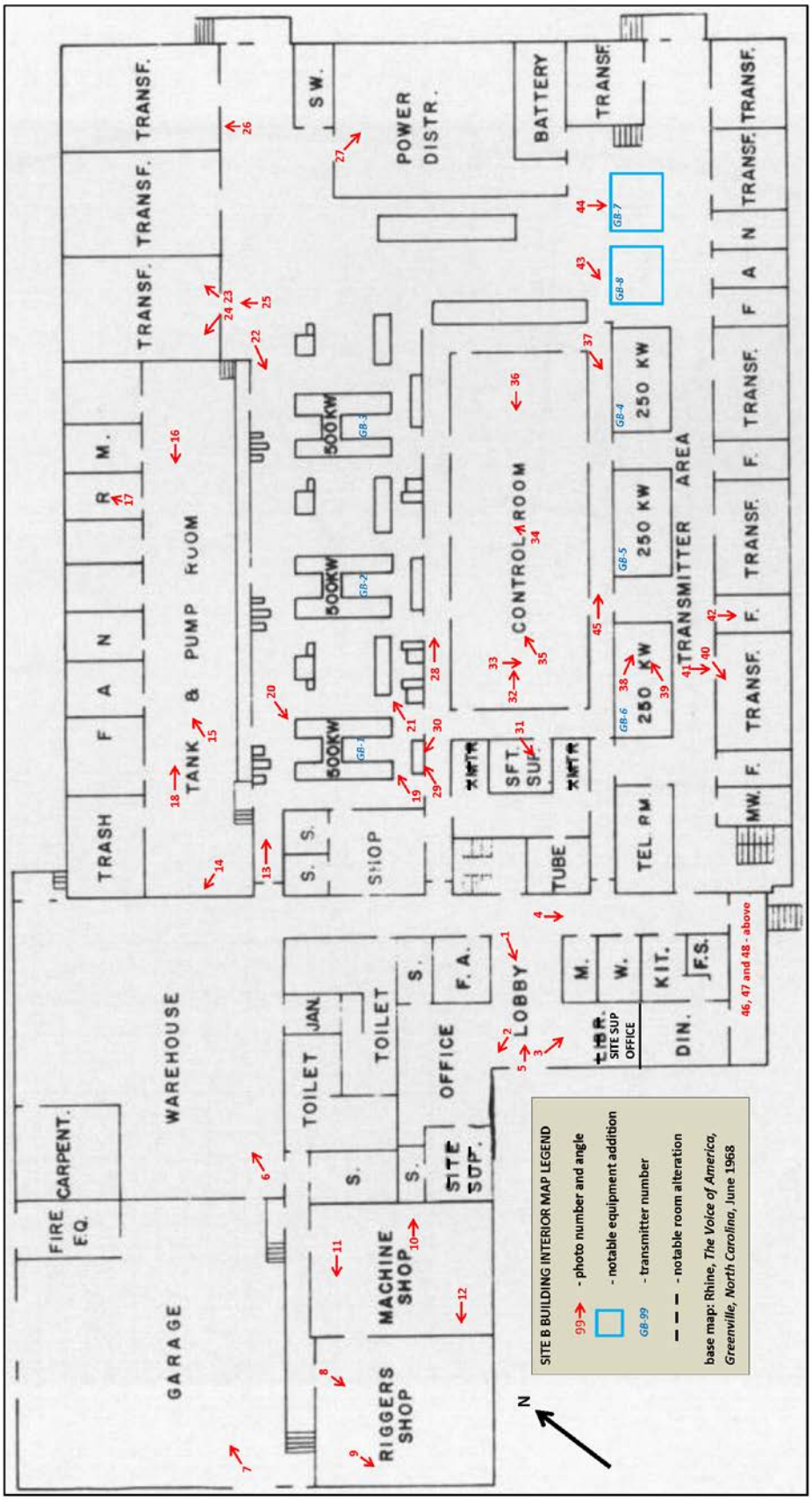
6 / 6

PHOTO LOG
EDWARD R. MURROW VOICE OF AMERICA STATION (PT1726)

NCDOT Project Number/Environmental Review Number: ER 15-2838
Project Description: Disposal of Voice of America Transmitting Station, Site A, Beaufort County
Survey Site Number and Name of Property: PT1726 / Edward R. Murrow Voice of America Station interiors
Street Address: 3919 VOA Site B Road
Vicinity or Town: Grimesland vicinity
County: Pitt County
Photographer's Name and Date of Photography: Marvin A. Brown – February 5, 2016

Photo ID Number	Description
PT1726_Murrow VOA Station_2-16_MAB-01.pdf	Lobby and main entrance, looking SW
PT1726_Murrow VOA Station_2-16_MAB-02.pdf	Administrative offices and main entrance, looking NW
PT1726_Murrow VOA Station_2-16_MAB-03.pdf	Site supervisor office (former library), looking S from lobby
PT1726_Murrow VOA Station_2-16_MAB-04.pdf	Corridor, looking S from lobby
PT1726_Murrow VOA Station_2-16_MAB-05.pdf	Lobby, looking E from main entrance at original paneling
PT1726_Murrow VOA Station_2-16_MAB-06.pdf	Warehouse with inventory shelves, looking NE
PT1726_Murrow VOA Station_2-16_MAB-07.pdf	Garage, looking NE toward warehouse behind double doors
PT1726_Murrow VOA Station_2-16_MAB-08.pdf	Former riggers shop with original fixed table at center, looking SW from entry to garage
PT1726_Murrow VOA Station_2-16_MAB-09.pdf	Former riggers shop, looking SW at operable windows
PT1726_Murrow VOA Station_2-16_MAB-10.pdf	Machine shop, looking E at original Index milling machine
PT1726_Murrow VOA Station_2-16_MAB-11.pdf	Machine shop, looking W at original Logan lathe and doors to riggers shop at right
PT1726_Murrow VOA Station_2-16_MAB-12.pdf	Machine shop, looking W at original tools mounted on wall
PT1726_Murrow VOA Station_2-16_MAB-13.pdf	North transmitter hall, looking E from warehouse entrance
PT1726_Murrow VOA Station_2-16_MAB-14.pdf	Tank and pump room, looking W at structural steel framing of W wall
PT1726_Murrow VOA Station_2-16_MAB-15.pdf	Tank and pump room, looking NE at tanks, pumps and fan rooms
PT1726_Murrow VOA Station_2-16_MAB-16.pdf	Tank and pump room, looking W at tanks, pumps and fan rooms in right wall
PT1726_Murrow VOA Station_2-16_MAB-17.pdf	Tank and pump room, looking up into fan in fan room
PT1726_Murrow VOA Station_2-16_MAB-18.pdf	Tank and pump room, looking E at tanks and pumps
PT1726_Murrow VOA Station_2-16_MAB-19.pdf	North transmitter hall, looking NE at 500kw Continental Electric transmitter (GB-1)
PT1726_Murrow VOA Station_2-16_MAB-20.pdf	North transmitter hall, looking SW at transmitter GB-1
PT1726_Murrow VOA Station_2-16_MAB-21.pdf	North transmitter hall, looking NE at rectifier stacks for transmitter GB-1
PT1726_Murrow VOA Station_2-16_MAB-22.pdf	North transmitter hall, looking SW at Continental Electric transmitters and air ducts extending down center of hall
PT1726_Murrow VOA Station_2-16_MAB-23.pdf	Transformer power vault for transmitter GB-1, looking from entry at transformers at E wall
PT1726_Murrow VOA Station_2-16_MAB-24.pdf	Transformer power vault for transmitter GB-1, looking from entry at filter capacitors and transient arrestors at W wall

Photo ID Number	Description
PT1726_Murrow VOA Station_2-16_MAB-25.pdf	Transformer power vault for transmitter GB-1, looking N at door from north transmitter hall
PT1726_Murrow VOA Station_2-16_MAB-26.pdf	View into Continental Electric line shorting device outside north transmitter hall transformer power vaults
PT1726_Murrow VOA Station_2-16_MAB-27.pdf	Power distribution room, looking SE at "house" transformers from entry
PT1726_Murrow VOA Station_2-16_MAB-28.pdf	Corridor north of control room, looking E at audio modulation equipment for Continental Electric transmitters
PT1726_Murrow VOA Station_2-16_MAB-29.pdf	Corridor north of control room, Continental Electric tuning console for transmitter GB-1
PT1726_Murrow VOA Station_2-16_MAB-30.pdf	Corridor north of control room, Continental Electric tuning console for transmitter GB-1
PT1726_Murrow VOA Station_2-16_MAB-31.pdf	Shift supervisor office, looking SW from entrance
PT1726_Murrow VOA Station_2-16_MAB-32.pdf	Control room, looking E toward control dais with switching equipment at right
PT1726_Murrow VOA Station_2-16_MAB-33.pdf	Control room, switching panel with original components at bottom and replacement switches at top
PT1726_Murrow VOA Station_2-16_MAB-34.pdf	Control room, looking NE at modern main transmitter control console on control dais
PT1726_Murrow VOA Station_2-16_MAB-35.pdf	Control room, looking NE at control dais
PT1726_Murrow VOA Station_2-16_MAB-36.pdf	Control room, looking W at monitor and synthesizer racks and control dais
PT1726_Murrow VOA Station_2-16_MAB-37.pdf	South transmitter hall, looking SW at control panel of 250kw General Electric transmitter (GB-4)
PT1726_Murrow VOA Station_2-16_MAB-38.pdf	South transmitter hall, tuning coil inside 250kw General Electric transmitter (GB-6)
PT1726_Murrow VOA Station_2-16_MAB-39.pdf	South transmitter hall, back side of control panel inside transmitter GB-6
PT1726_Murrow VOA Station_2-16_MAB-40.pdf	Transformer power vault for transmitter GB-6, looking inside from entry
PT1726_Murrow VOA Station_2-16_MAB-41.pdf	Transformer power vault for transmitter GB-6, looking S at entry
PT1726_Murrow VOA Station_2-16_MAB-42.pdf	Fan room for 250kw General Electric transmitter (GB-5)
PT1726_Murrow VOA Station_2-16_MAB-43.pdf	South transmitter hall, looking SW at control panel of 500kw AEG transmitter (GB-8) installed ca.1990 and transmitter GB-4 at right
PT1726_Murrow VOA Station_2-16_MAB-44.pdf	South transmitter hall, looking S at control panel of 500kw Brown Boveri Company transmitter (GB-7) installed ca.1990
PT1726_Murrow VOA Station_2-16_MAB-45.pdf	Corridor south of control room, looking E with transmitter GB-5 at right
PT1726_Murrow VOA Station_2-16_MAB-46.pdf	Ventilator fans at second story
PT1726_Murrow VOA Station_2-16_MAB-47.pdf	Stairs from second story to viewing tower
PT1726_Murrow VOA Station_2-16_MAB-48.pdf	Viewing tower with control handle for searchlight hanging from ceiling


SITE B BUILDING INTERIOR MAP LEGEND
99→ - photo number and angle
GB-99 - notable equipment addition
- - - - transmitter number
- - - - notable room alteration
base map: Rhine, The Voice of America, Greenville, North Carolina, June 1968
N
GARAGE
FIRE EQ.
CARPENT.
WAREHOUSE
TOILET JAN.
TOILET
S.
OFFICE
F. A.
LOBBY
M.
W.
KIT.
DIN.
F.S.
SITE SUP OFFICE
MACHINE SHOP
RIGGERS SHOP
SITE SUP.
TRASH
TANK
PUMP ROOM
FAN
TRANSF.
SW.
POWER DISTR.
BATTERY
SHOP
TUBE
TEL RM
SFT SUP.
CONTROL ROOM
TRANSMITTER AREA
250 KW
500KW
MW.
46, 47 and 48 - above


PT1726_Murrow VOA Station_2-16_MAB-03.JPG


PT1726_Murrow VOA Station_2-16_MAB-06.JPG


PT1726_Murrow VOA Station_2-16_MAB-09.JPG


PT1726_Murrow VOA Station_2-16_MAB-02.JPG


PT1726_Murrow VOA Station_2-16_MAB-05.JPG


PT1726_Murrow VOA Station_2-16_MAB-08.JPG


PT1726_Murrow VOA Station_2-16_MAB-01.JPG


PT1726_Murrow VOA Station_2-16_MAB-04.JPG


PT1726_Murrow VOA Station_2-16_MAB-07.JPG

1 / 6

PT1726_Murrow VOA Station_2-16_MAB-12.JPG

PT1726_Murrow VOA Station_2-16_MAB-15.JPG

PT1726_Murrow VOA Station_2-16_MAB-18.JPG

PT1726_Murrow VOA Station_2-16_MAB-11.JPG

PT1726_Murrow VOA Station_2-16_MAB-14.JPG

PT1726_Murrow VOA Station_2-16_MAB-17.JPG

PT1726_Murrow VOA Station_2-16_MAB-10.JPG

PT1726_Murrow VOA Station_2-16_MAB-13.JPG

PT1726_Murrow VOA Station_2-16_MAB-16.JPG

2 / 6

PT1726_Murrow VOA Station_2-16_MAB-21.JPG

PT1726_Murrow VOA Station_2-16_MAB-24.JPG

PT1726_Murrow VOA Station_2-16_MAB-27.JPG

PT1726_Murrow VOA Station_2-16_MAB-20.JPG

PT1726_Murrow VOA Station_2-16_MAB-23.JPG

PT1726_Murrow VOA Station_2-16_MAB-26.JPG

PT1726_Murrow VOA Station_2-16_MAB-19.JPG

PT1726_Murrow VOA Station_2-16_MAB-22.JPG

PT1726_Murrow VOA Station_2-16_MAB-25.JPG

3 / 6

PT1726_Murrow VOA Station_2-16_MAB-30.JPG

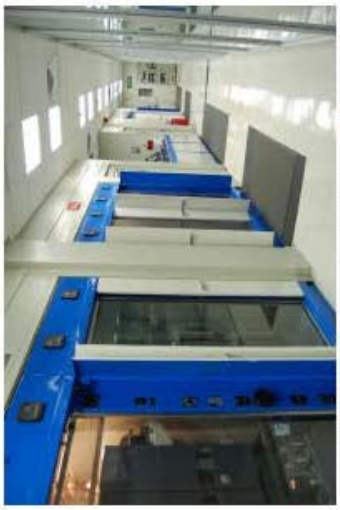
PT1726_Murrow VOA Station_2-16_MAB-33.JPG

PT1726_Murrow VOA Station_2-16_MAB-36.JPG

PT1726_Murrow VOA Station_2-16_MAB-29.JPG

PT1726_Murrow VOA Station_2-16_MAB-32.JPG

PT1726_Murrow VOA Station_2-16_MAB-35.JPG



PT1726_Murrow VOA Station_2-16_MAB-28.JPG

PT1726_Murrow VOA Station_2-16_MAB-31.JPG

PT1726_Murrow VOA Station_2-16_MAB-34.JPG

4 / 6

PT1726_Murrow VOA Station_2-16_MAB-37.JPG


PT1726_Murrow VOA Station_2-16_MAB-38.JPG


PT1726_Murrow VOA Station_2-16_MAB-39.JPG


PT1726_Murrow VOA Station_2-16_MAB-40.JPG

PT1726_Murrow VOA Station_2-16_MAB-41.JPG


PT1726_Murrow VOA Station_2-16_MAB-42.JPG


PT1726_Murrow VOA Station_2-16_MAB-43.JPG


PT1726_Murrow VOA Station_2-16_MAB-44.JPG


PT1726_Murrow VOA Station_2-16_MAB-45.JPG

PT1726_Murrow VOA Station_2-16_MAB-48.JPG

PT1726_Murrow VOA Station_2-16_MAB-47.JPG

PT1726_Murrow VOA Station_2-16_MAB-46.JPG

6 / 9