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DOE Contract No. DE-AC05-98OR22700
Job No. 23900
February 6, 2003

Mr. W. Don Seaborg
Paducah Site Office
Department of Energy
P.O. Box 1410
Paducah, KY 42002-1410

Subject: Cultural Resource Survey and National Register Assessment for the C-410 Complex, Paducah Gaseous Diffusion Plant (PGDP), McCracken County, Kentucky

Dear Mr. Seaborg:

Enclosed for your submittal and use are two copies of the report for the C-410 Complex at the PGDP, prepared by Mr. Philip Thomason of Thomas and Associates of Nashville, TN. In addition to the report, also enclosed are copies of building elevations and black and white photographs in accordance with the recordation requirements.

It is Thomas and Associates' assessment that the C-410 Complex meets the National Register criteria as a contributing building to the potentially eligible PGDP Historic District. The exact boundaries and eligibility of the potential district will be discussed in more detail following the completion of a site-wide cultural resources survey scheduled for later this year.

Please submit the original report to the following; a draft transmittal letter is enclosed for your use.

Mr. Craig Potts
KY Heritage Council
300 Washington Street
Frankfort, KY 40601

Please feel free to contact Brad Montgomery of my staff at (270) 441-5075 if you have any questions or require additional information.

Sincerely,

for Gordon L. Dover
Paducah Manager of Projects

GLD:lj
LTR-PAD/DD-LJ-03-0004

Enclosures:
1) Cultural Resource Survey and National Register Assessment for the C-410 Complex
2) Building Elevations and Black and White Photographs
3) Draft transmittal letter

c: B. A. Bowers, LAN-CON
D. R. Guminski
D. M. Massey
G. E. VanSickle

c/enc: B. J. Montgomery
File-EMEF-DMC-PAD-RC

(83)

CULTURAL RESOURCE SURVEY AND NATIONAL REGISTER ASSESSMENT

C-410 COMPLEX
PADUCAH GASEOUS DIFFUSION PLANT
MCCRACKEN COUNTY, KENTUCKY

JANUARY 20, 2003

Report Prepared By
Thomason and Associates
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Report Prepared For
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Principal Investigator, Philip Thomason

Reviewing Agency: Kentucky Heritage Council

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ABSTRACT

The United States Department of Energy (DOE) proposes the decontamination and decommissioning (D&D) of the C-410 Complex of the Paducah Gaseous Diffusion Plant (PGDP) near Paducah, in McCracken County, Kentucky. The DOE owns the PGDP and leases the facilities used for enriching uranium to the United States Enrichment Corp. Inc. (USEC), a private company. The PGDP was established in 1952 as a uranium enrichment plant for the production of nuclear weapons. It is located approximately 12 miles west of Paducah and contains 161 buildings. The C-410 Complex served as a feed plant to the cascade diffusion system of the main processing buildings and is located in the central portion of the PGDP. The complex contains one main building with various expansions and associated support facilities. Operations within the complex ceased in 1994, and the facility is currently in a decommission and decontamination mode (D&D).

The purpose of this study is to survey and evaluate the C-410 Complex of the PGDP for eligibility on the National Register of Historic Places and to comply with provisions of a draft Programmatic Agreement among the Department of Energy, the Kentucky State Historic Preservation Officer, and the Advisory Council on Historic Preservation that concerns the management of historical properties at the PGDP.

This report was prepared by Thomason and Associates, Preservation Planners of Nashville, Tennessee (Consultant). Over the past decade, this firm has completed several studies of nuclear production facilities at Oak Ridge, Tennessee for the Department of Energy. Based on these studies and other research, it is the opinion of the Consultant that the PGDP contains a potentially eligible National Register Historic District. This district is significant under National Register Criterion A for its military significance during the Cold War. The PGDP was one of three U.S. facilities in operation during the Cold War which produced enriched uranium for nuclear weapons. Nuclear weapons were the country's primary offensive and defensive weapons system of the Cold War.

The main components of this district would be the plant's four main production buildings, which contain the plant's historic cascade system critical to the uranium enrichment process. The C-410 Complex also would be considered a contributing element to the district. In 1994, an environmental study of the C-410 Complex, "Level III Baseline Risk Evaluation for theC-410 Complex at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky," was completed. This report concluded that the complex poses a potential health risk to site workers and the general public. Future adaptive reuse of the building is unfeasible due to risk of exposure to uranium contamination. Decontamination and Decommissioning of the C-410 Complex is considered necessary for the health and safety of PGDP workers and the surrounding public.

I. INTRODUCTION

The DOE proposes the decontamination and decommissioning of the C-410 Complex of the Paducah Gaseous Diffusion Plant near Paducah, in McCracken County, Kentucky. The DOE owns the PGDP and leases the facilities used for enriching uranium to the United States Enrichment Corp. Inc. (USEC), a private company. The PGDP was established in 1952 as a uranium enrichment plant for the production of nuclear weapons. The PGDP is located in western Kentucky approximately 3.5 miles south of the Ohio River and 12 miles west of the city of Paducah (Figure 1). The DOE site covers 3,425 acres, of which the PGDP occupies 750 acres.[1] This acreage includes only that portion of the property inside the main security fence. The PGDP contains 161 buildings, and the C-410 Complex is located in the central portion of the plant (Figure 2). Constructed between 1953 and 1957, the C-410 Complex served as a feed plant to the cascade diffusion system of the main processing buildings. It consists of the main C-410 Building as well as buildings C-420, C-411, and various support facilities including three storage tanks and a sludge lagoon. Due to extensive contamination, DOE proposes to decontaminate and decommission the C-410 Complex of the PGDP.

DOE has agreed with the Environmental Protection Agency (EPA) to perform D&D under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) process. The C-410 infrastructure removal is proceeding as a Non-Time Critical Removal Action under CERCLA.

As a federally-owned property, PGDP is also under obligation to comply with Section 106 of the National Historic Preservation Act. This review process is outlined in the U.S. Code of Federal Regulations at 36 CFR Part 800. This survey and National Register Assessment was completed at the request of DOE during the week of January 6, 2003. Philip Thomason, Principal of Thomason & Associates, completed the scope of work.

The purpose of this study was to:

- Survey the C-410 Complex in accordance with Kentucky survey standards;

- Evaluate the C-410 Complex of the PGDP for eligibility on the National Register of Historic Places, and;

- Comply with provisions of a draft Programmatic Agreement among the Department of Energy, the Kentucky State Historic Preservation Officer, and the Advisory Council on Historic Preservation concerning the management of historical properties at the Paducah Gaseous Diffusion Plant. This Programmatic Agreement was still in draft form as of January 2003 and calls for the completion of a Cultural Resources Survey and Cultural Resources Management Plan (CRMP) for PGDP within two years of final agreement. Until the CRMP is finalized and implemented, PGDP is responsible for Section 106 Review of activities that will adversely affect the facility's historic properties.

Production of uranium hexaflouride feed material within the C-410 Complex halted in 1977. All operations in the C-410 Complex ceased in 1994 and it was put in a D&D phase. At this time DOE prepared a Level 3 Baseline Risk Evaluation (BRE) for the complex to assess its potential risks to human health and the environment. The study revealed that uranium contamination is present in and on nearly all parts of the facility and equipment and concluded that the complex poses a potential health risk to site workers and the

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[1] USEC website, www.usec.com, "Paducah Plant Key Facts."

general public.[2] Due to the risk of exposure, future adaptive reuse of the building is not feasible. The 1994 BRE report indicated that current conditions exceed the acceptable risk range for site-related exposures under both current and potential future uses.[3] Demolition of the C-410 Complex is necessary for the health and safety of PGDP workers and the surrounding public.

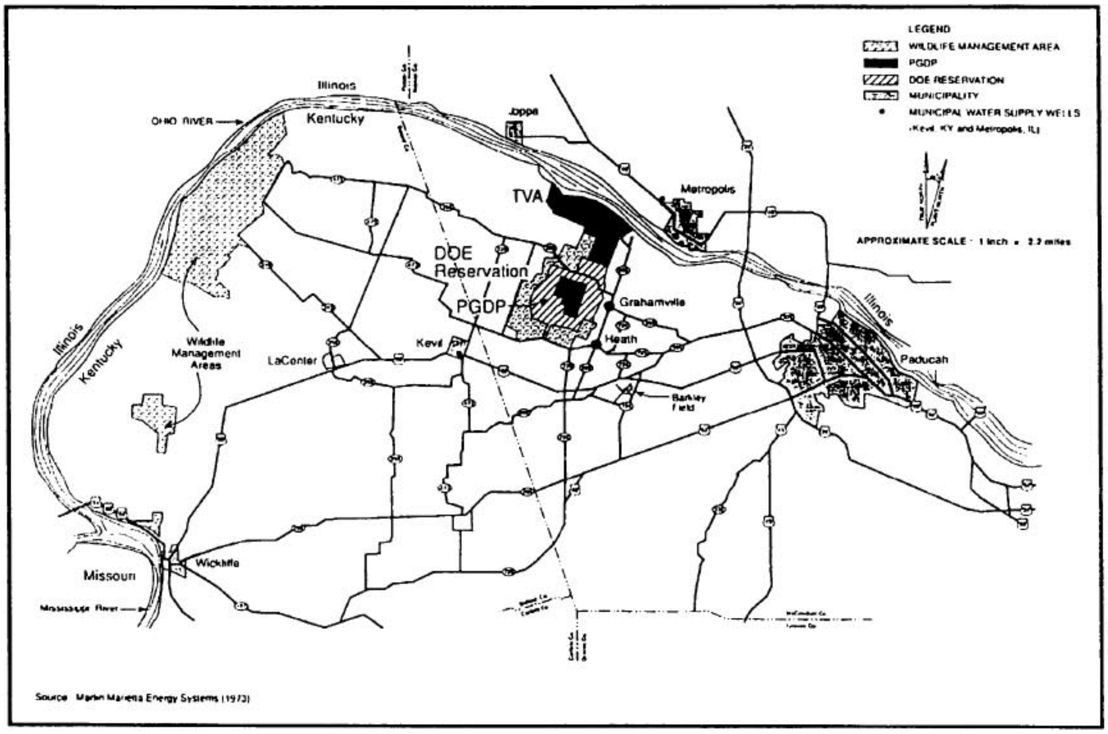

Figure 1: Paducah Gaseous Diffusion Plant Vicinity Map.

[2] "Engineering Evaluation/Cost Analysis for theC-410 Complex Infrastructure at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky," Prepared for the U.S. Department of Energy, Office of Environmental Management, October 2001, ix.
[3] Ibid., 1-23.

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II. RESEARCH AND SURVEY METHODOLOGY

This assessment was conducted in accordance with the Secretary of the Interior's Standards and Guidelines for Archaeology and Historic Preservation (National Park Service 1983). The study was also completed following recommendations set forth in the following documents: *Guidelines for Local Surveys: A Basis for Preservation Planning: National Register Bulletin #24* (National Park Service 1985); and the *Kentucky Historic Resources Survey Manual* (Kentucky Heritage Council 2001).

Existing research on PGDP's role in the Cold War is minimal and documentation on the plant's local and regional impact is limited. For this project, various secondary sources provided information on the Cold War era in general, and local newspaper articles of the period provided insight into the plant's role in the regional community. A comprehensive overview of the plant and its contribution to the context of the Cold War as well as its impact on local and regional development will be developed in the upcoming PGDP CRMP.

A discussion with Craig Potts of the Kentucky Heritage Council in January 2003 revealed that cultural resource studies at PGDP have been minimal. Limited archaeological surveys were conducted at the plant in the early 1990s, but no surveys of historic buildings and structures have been completed at PGDP. A Programmatic Agreement between the Department of Energy Paducah Site Office, the Kentucky State Historic Preservation Officer, and the Advisory Council on Historic Preservation concerning the management of historical properties at PGDP is currently in draft form and calls for the preparation of a CRMP for PGDP. The CRMP is to be completed within two years of the final agreement and will include a survey and evaluation of all historic properties of PGDP.

The prototype gaseous diffusion plant was constructed at Oak Ridge, Tennessee in 1943. Known as K-25, this plant is considered one of the signature buildings of the Manhattan Project and has been identified as eligible as a National Historic Landmark.[4] During the early 1950s, additional gaseous diffusion plants were constructed at two locations; Paducah and Portsmouth, Ohio. Paducah was completed in 1954 and the Portsmouth plant was placed in operation in 1956. In January of 2003, the Consultant contacted the Ohio SHPO and spoke with David Snyder of that office regarding the National Register eligibility of the Portsmouth plant. No formal architectural/historical report has been completed on the Portsmouth plant to date, but such a report is currently in progress. According to Mr. Snyder, the Ohio SHPO has determined that the entire plant is eligible for the National Register for its Cold War significance.[5] The Consultant also interviewed F.G. "Skip" Gosling, Historic Preservation Officer for the Department of Energy, regarding the National Register eligibility of the Paducah and Portsmouth plants. Gosling agreed that both plants are potentially eligible for their state and local significance, and that the primary processing buildings would be the key contributing elements to these districts with ancillary support building contributing to the districts as well.[6]

In January 2003, the Consultant conducted a reconnaissance level survey of PGDP in order to ascertain the location of the C-410 Complex within the 1950s footprint of the plant. This field work was conducted in accordance with Kentucky Heritage Council (KHC) standards including the completion of black and white photography. A KHC survey form was completed for the C-410 Complex and is located in Appendix B. The survey was conducted by Philip Thomason, Principal of Thomason and Associates on January 6, 2003.

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[4] Joe Garrison, Section 106 Coordinator, Tennessee Historical Commission (SHPO), January 15, 2003.
[5] David Snyder, Section 106 Coordinator, Ohio Historic Preservation Office, Telephone Interview, January 13, 2003.
[6] F.G. "Skip" Gosling, Historic Preservation Officer, Department of Energy, Washington, D.C. Telephone Interview, January 14, 2003.

As a result of the reconnaissance level survey, the Consultant identified a potential National Register Historic District that focuses on the four main processing buildings of PGDP. These four buildings are arranged in an "L" pattern, and the C-410 Complex is located adjacent to the center processing building. As a support facility to the plant's historic diffusion process, the C-410 Complex would be considered a contributing element to the potential district.

The Area of Potential Effect (APE) for this project was defined as the boundaries of the Paducah Gaseous Diffusion Plant. An APE is the area surrounding the particular building or site that is under review that could be affected by undertakings to that building or site. Typically an APE is defined by a specific distance, such as a mile, but because Building C-410 is situated in a large industrial complex, the plant boundaries serve as sufficient APE for this project. Building C-410 and its associated support structures are surrounded by similar industrial building within the plant and are not readily visible from outside the plant's boundaries. Building C-410 and associated support structures are described and evaluated in *Section IV: Description and Evaluation of Historic Properties*.

III. HISTORIC CONTEXT

A. Development of Nuclear Energy and the Manhattan Project

The Paducah Gaseous Diffusion Plant is the only operating uranium enrichment facility in the United States. The plant is owned by the U.S. Department of Energy, which leases the facilities used for enriching uranium to USEC, a private company. Uranium enrichment is the process through which natural uranium has the proportion of one of its components, the isotope U-235, increased to a level that is suitable for commercial reactor fuel. Following enrichment, the uranium is sent to a commercial company for converting into the proper chemical compound and shape for use as fuel in a nuclear reactor. The Paducah plant employs the gaseous diffusion method to perform this process.

The development of nuclear energy emerged from various scientific discoveries of the 1930s. During the early years of this decade, scientists discovered that the nucleus of an atom contains neutrons, particles with no charge, as well as electrons and protons, particles with negative and positive charges. Further research revealed that atoms of the same element can have different weights depending on the number of neutrons in a particular atom's nucleus. These "different classes of atoms of the same element but with varying numbers of neutrons were designated isotopes."[7]

There are three isotopes of uranium, a naturally occurring element found in the earth. All three of these isotopes have ninety-two (92) protons and ninety-two (92) electrons, but each has a different number of neutrons and thus a different atomic weight. Uranium-238 (U-238) has 146 neutrons and is the heaviest of the three isotopes. It accounts for over 99% of natural uranium. Uranium-235 has 143 neutrons in its nucleus and makes up only 0.7% of natural uranium. The third isotope, uranium-234, has 142 neutrons and is found only in traces of the element.[8] This slight difference in the atomic weights of uranium isotopes played a key role in the development of nuclear energy.

Additional advancements in the field of physics during the 1930s included the discovery of fission. In the early 1930s it was known that bombarding elements with protons could split atoms. In 1934, an Italian scientist bombarded elements with neutrons instead. In 1939, Berlin radiochemists used this method with uranium and realized that "while the nuclei of most elements changed somewhat during neutron bombardment, uranium nuclei changed greatly and broke into two roughly equal pieces."[9] The end products weighed less than the original uranium, therefore, using Einstein's $E=mc^2$ equation, the loss of mass was converted into a form of kinetic energy. This energy in turn could be converted into heat. This process of splitting atoms and creating energy is called fission.

During the fission process neutrons are released. If they collide with other atoms, additional neutrons are released and in turn smash into more atoms, which release more neutrons to smash into more atoms, and so on. This chain reaction produces a continuous release of energy. Once discovered, scientists realized that "a controlled self-sustaining reaction could make it possible to generate a large amount of energy for heat and power, while an unchecked reaction could create an explosion of huge force."[10] The binding

[7] F.G. Gosling, "The Manhattan Project: Making the Atomic Bomb," (United States Department of Energy, September 1994), 1.
[8] Ibid.
[9] Ibid., 2.
[10] Ibid.

energy of the nucleus so released would be tremendous, ten million times larger than the energy released by chemical reactions.[11]

As these scientific discoveries emerged, war was mounting in Europe. Scientists realized uranium fission made possible the creation of a new weapon, one with a potential for mass destruction, and the race to build the first atomic bomb began. Government supported research intensified concentrating on isotope separation. After the bombing of Pearl Harbor on December 7, 1941 brought the United States into World War II, the urgency to develop atomic power intensified. The initial challenge before scientists was to create a practical demonstration of a chain reaction. Physicists working at the University of Chicago under the direction of Arthur Compton achieved this goal on December 2, 1942. The experiment, which was conducted on a squash court located beneath the university's football stadium, successfully created a controlled nuclear reaction by specially arranging tons of uranium and graphite.[12]

In response to the need for atomic research, the United States government initiated the Manhattan Project, a top secret effort to develop nuclear weapons. The Army Corps of Engineers was responsible for the project and establishing sites for uranium separation and the production of plutonium, which also had the ability to create an explosion. Sites associated with the Manhattan Project were established in Oak Ridge, Tennessee, Los Alamos, New Mexico, and Hanford, Washington. Research to support the project took place at universities, laboratories, and plants across the country. Universities as diverse as Columbia, the University of California at Berkeley, and the University of Chicago were key players.

It was discovered early on that the fission in uranium occurred primarily in uranium atoms of the lighter and more rare U-235 isotope, which accounts for less than one percent of natural uranium. In order to create a chain reaction using U-235, scientists had to separate it from the heavier U-238 isotope and concentrate it into a critical mass. Scientific studies revealed various possible approaches for separating the uranium isotopes, and scientists heavily debated which process would be ultimately successful. In late 1942, the choice was narrowed to two methods, the electromagnetic process and the gaseous diffusion process. At this point no one had ever separated uranium isotopes in any but micro-lab-scale quantities, and mass quantities were required for the development of atomic weapons.

The process of gaseous diffusion is based on the principle that lighter isotopes will pass through a porous barrier more readily than the heavier isotopes. The process begins with a form of uranium called uranium hexaflouride or UF6. At room temperature, UF6 is a solid, but when heated above 135 degrees Fahrenheit it becomes a gas. The gas is then fed into a cascade system of porous membrane barriers with microscopic openings. The lighter U-235 isotope passes through the barriers more easily, and as the gas moves through multiple levels of the cascade system, the isotopes separate to create a higher concentration of U-235 in the upper barriers (Figure 3).[13]

The Manhattan Project used both gaseous diffusion and electromagnetic diffusion to create enriched uranium for atomic weapons. During the early 1940s, two plants were established in Oak Ridge, Tennessee, for these purposes: K-25 and Y-12. K-25 was the gaseous diffusion plant for the Manhattan Project. Built in 1943, K-25's general form assumed a U-shape and was composed of fifty-four

[11] Jonathan Logan, "The Critical Mass," *American Scientist* (May-June 1996), 264.
[12] C. Allardice and E.R. Trapnell, *The Atomic Energy Commission* (New York: Praeger Publishers, 1974), 6-7.
[13] United States Enrichment Corporation (USEC) website: www.usec.com.

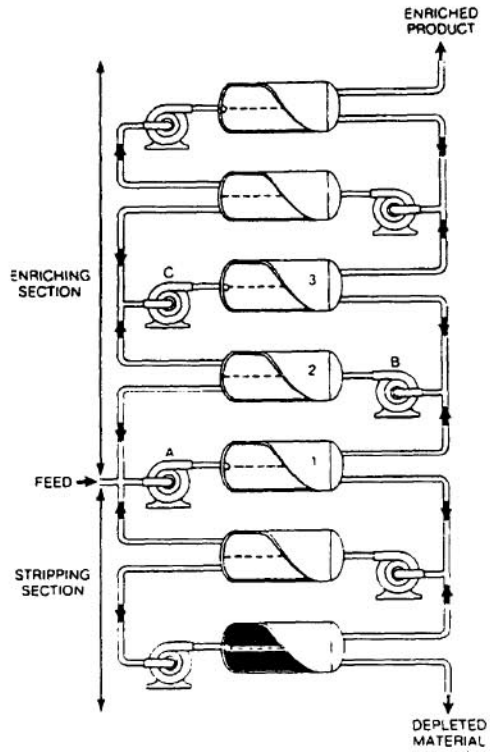

Figure 3: Schematic Diagram of Gas Flow in Gaseous Diffusion Cascade *(diagram courtesy of The Manhattan Project: Making the Atom Bomb).*

contiguous four-story buildings. The complex was almost a half mile in length and averaged 400 feet in width, and stood 60 feet tall. The total area for the main building alone encompassed 44 acres.[14]

First attempts at developing a viable barrier process met with failure, and K-25 was able to only partially enrich the uranium. At this point the gaseous diffusion process was curtailed in favor of the electromagnetic process of uranium enrichment at Y-12. The final and upper stages of the cascade system were eliminated as uranium was taken from the middle of the K-25 cascade process, and used as feed for Y-12.[15] Meanwhile, research on the barrier process continued and improvements were made by 1944 and K-25 ultimately produced 60% enriched product.

The efforts of the Manhattan Project resulted in the development of the world's first atomic bomb, which the United States dropped on the city of Hiroshima, Japan, on August 6, 1945. Its power and devastation were unlike any seen before. Approximately 100,000 people were killed instantly and an additional 100,000 were fatally injured.[16] The bombing led to the surrender of Japan and the eventual end of World War II.

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[14] R.G. Hewlett and O.E. Anderson, *The New World, 1939/1946: Volume I, A History of the United States Atomic Energy Commission* (University Park, PA: Pennsylvania State University, 1962), 123; G.O. Robinson, *The Oak Ridge Story* (Kingsport, TN: Southern Publishers, 1950), 81.
[15] Hewlett and Anderson, 129.
[16] Gosling, 51.

B. America's Nuclear Program and the Cold War

Following the end of World War II, the Atomic Energy Commission (AEC) formed to lead America's nuclear research program. Management of atomic research and production facilities was transferred from the military to civilian corporations such as Union Carbide. Although some plants of the Manhattan Project were shut down, K-25 continued to produce enriched uranium to feed processes at Y-12.

The introduction of the atomic bomb brought a new challenge to international relations and introduced a power struggle between leading nations. The United States' monopoly on atomic weapons did not last long. In 1949, Russia revealed that it too had successfully tested an atomic weapon. Unable to reach an agreement over arms control, the two superpowers locked into a relationship of mutual suspicion as each began to stockpile a nuclear arsenal. The mounting distrust between the two countries was fueled by fundamental differences in their political and social ideologies of communism and democracy, and a global struggle emerged between the two philosophies. Known as the Cold War, this period of distrust and arms development between the Soviet Union and the United States continued until 1989.

A trigger to the Cold War was the "failure of the World War II allies to reach agreements on international controls respecting nuclear research and atomic weapons" immediately following the war.[17] Scientists in the United States broached the topic of arms control prior to the war's end. Aware that their counterparts in the Soviet Union were not far behind them in nuclear research, U.S. scientists advocated the formation of an international organization to prevent nuclear conflict as early as 1944. A peacetime policy of full publicity and cooperation was encouraged.[18]

In June 1946, the U.S. presented a formal proposal for the international control of atomic energy to the United Nations. Presented by statesman Bernard Baruch, the proposal was known as the Baruch Plan and recommended that an international atomic development authority be created to control nuclear activities and to license and inspect nuclear projects. After the authority was established, all existing bombs were to be destroyed and no other bombs would be built. The Soviet Union quickly rejected the proposal stating that all atomic weapons should be destroyed prior to the formation of the international authority. They maintained that the U.S. held an unfair advantage because of its existing stockpile of nuclear weapons. The U.S., on the other hand, argued that an international agreement must precede a reduction in arms. With both sides unwilling to compromise, the debate reached a stalemate. Relations between the United States and the Soviet Union continued to deteriorate and the U.S. continued to develop its nuclear arsenal.[19]

Relations between the two nations continued to be strained and in 1949 the Soviet Union revealed that it had successfully tested its first nuclear weapon. The political situation in Asia added fuel to the fire in the global struggle between communism and democracy. In February 1950, the Soviet Union signed a treaty of alliance and mutual assistance with the People's Republic of China. During this same period tensions between communist North Korea and independent South Korea were escalating into war. On June 25, 1950, the North Korean army aided by thousands of Chinese soldiers invaded South Korea. Five days later, U.S. forces entered the conflict to assist South Korea.[20]

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[17] Ibid., 55.
[18] Ibid., 55-56.
[19] Ibid., 56-57.
[20] Richard Rhodes, *Dark Sun. The Making of the Hydrogen Bomb* (New York: Simon and Schuster, 1995),434-437.

C. Establishment of the Paducah Gaseous Diffusion Plant

In response to the mounting international situation, the United States was compelled to increase its nuclear stockpile and moved forward in establishing a new gaseous diffusion plant for uranium enrichment. In December 1950, the AEC selected a site near Paducah, Kentucky (Figure 4). A total of eight sites were considered for the location of the new plant including Bowling Green, Owensboro, Paducah, and Wolf Creek in Kentucky, White River and Fort Smith, Arkansas, and Sterlington and Shreveport, Louisiana. An advantage of the Paducah site was that a portion of the land was already government-owned. The Kentucky Ordnance Works (KOW), which had developed TNT during World War II, occupied some 16,000 acres about sixteen miles west of Paducah. Following the war, the government shut down KOW and sold most of the property with the stipulation that it could repurchase the land if necessary. The federal government still owned approximately 1,400 acres of the property and to accommodate the new gaseous diffusion plant, the AEC needed to acquire an additional 3,600 acres.[21]


The Paducah Sun-Democrat

AEC To Build A-Plant At KOW Site

Chinese Reds Drive Into UN Beachhead

Building Force Of 10,000 May Be Required

Figure 4: Front page of the Paducah Sun-Democrat Newspaper, December 15, 1950 *(photo courtesy of 50th Anniversay Paducah Gaseous Diffusion Plant Presentation).*

Work on the Paducah Gaseous Diffusion Plant began immediately with groundbreaking activities starting January 2, 1951 (Figure 5). F.H. McGraw and Co. of Hartford, Connecticut won the contract to build the nuclear plant, and Carbide and Carbon Chemicals Company (subsequently Union Carbide) was selected to manage and operate the facility. The plant cost an estimated $800 million and was in operation by September 1952. Construction continued at the plant until 1954.

Construction of the gaseous diffusion plant in Paducah had a tremendous impact on local and regional economic, commercial, and industrial development. Initial construction required some 20,000 workers, and the plant created an additional 1,600 permanent jobs in the area (Figure 7). The construction of two steam power plants in the area to supply the new plant with electricity created even further employment

[21] "Atomic Plant to be Located At KOW Site Here," *The Paducah Sun-Democrat*, (15 December 1950).

opportunities. The gaseous diffusion process consumes an enormous amount of energy and existing power supplies were not sufficient. To meet this demand the Tennessee Valley Authority (TVA) constructed the Shawnee Steam Plant adjacent to the AEC property for a reported $84,000,000, and Electric Energy, Inc. constructed the Joppa Steam Plant along the banks of the Ohio River in Illinois (Figure 6).[22] In 1953, the Paducah Gaseous Diffusion Plant used a reported 9,772,912 megawatt hours of electricity and spent over $49.5 million for its power supply.[23] In 1958, the Honeywell Corporation constructed a large chemical plant in nearby Metropolis, Illinois, which supplied the Paducah plant with forms of uranium.

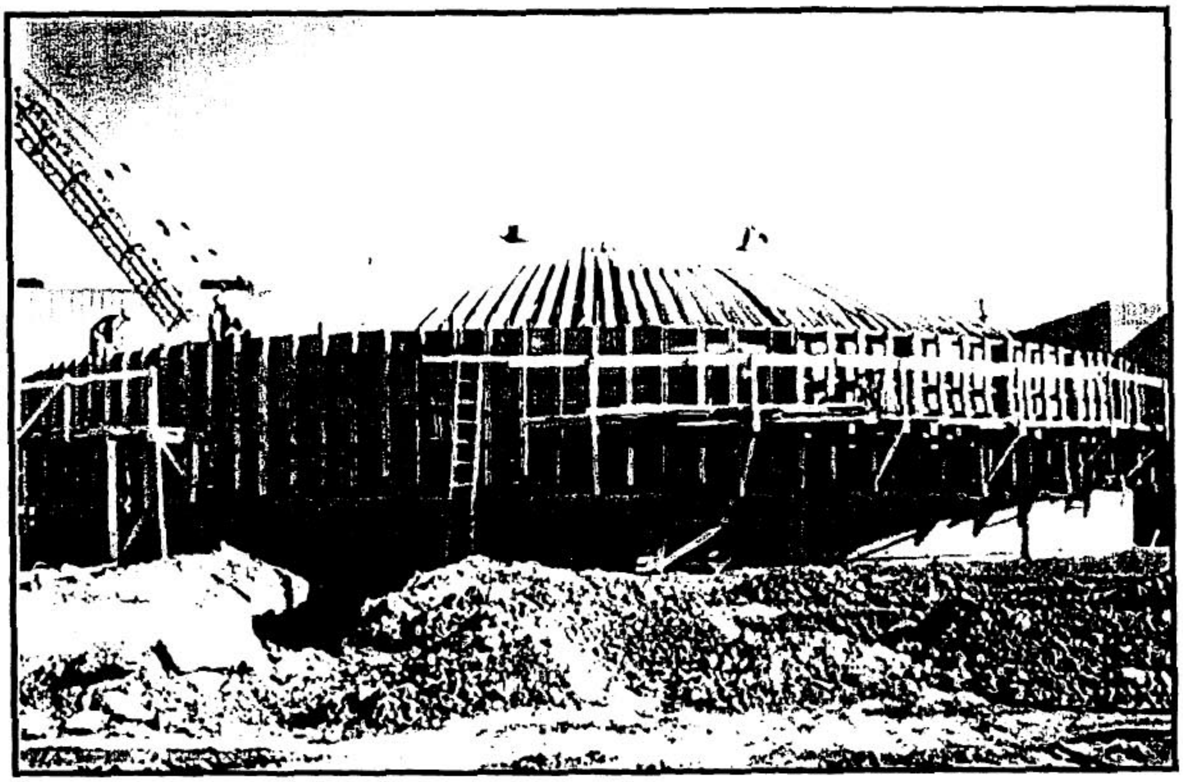

Figure 5: Construction of the Paducah Gaseous Diffusion Plant began in 1951. This building was designed as the plant's main control and operation facility *(photo courtesy of 50th Anniversary Paducah Gaseous Diffusion Plant Presentation).*

[22] Ibid; John E.L. Robertson, *Paducah, 1830-1980, A Sesquicentennial History* (Paducah, KY: Image Graphics, 1980), 103.
[23] "A Fantastic Power User," *The Paducah Sun-Democrat*, (17 April 1953).

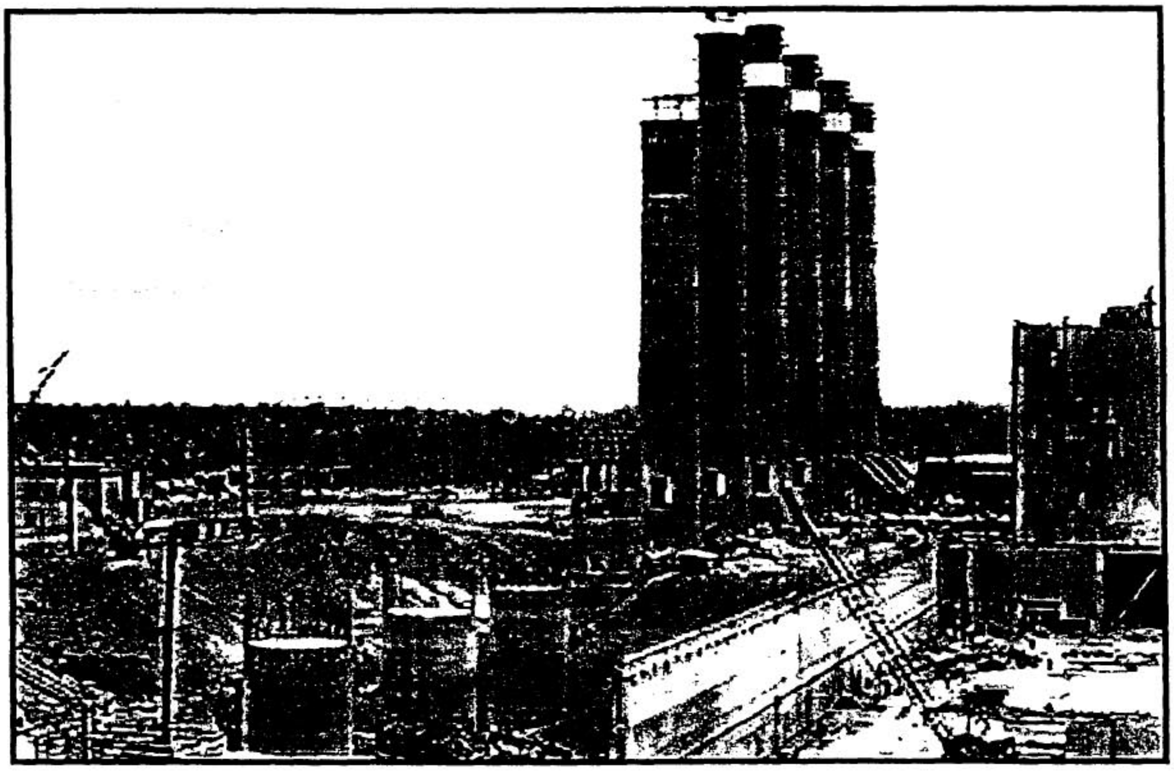

Figure 6: TVA's adjacent Shawnee Power Plant was completed in 1953 to fulfill half of the Paducah plant's power needs *(photo courtesy of 50th Anniversay Paducah Gaseous Diffusion Plant Presentation).*

News of the plant spread quickly and the promise of jobs drew people to Paducah by the thousands. With a population of 33,000 in 1950, Paducah nearly doubled in size within three years. Housing was a major issue for the burgeoning town. Surplus housing was sold quickly and locals rented spare rooms, attics, and even outbuildings. Trailer courts sprang up around the town's perimeter and some people were forced to live in tents. The AEC built a 1,000-room temporary barracks at the plant site in 1951 to accommodate workers, and the government provided funding for hundreds of apartment buildings and at least 175 houses. Hundreds of other houses were constructed by private companies. Local entrepreneur Forrest Harman purchased 250 portable flattop houses that had originally been used at Oak Ridge, Tennessee, during the construction of that city during World War II. Harman had the buildings shipped to Paducah and situated them on land near the plant site.[24] The village was first known as Flattop and later Forrestdale.

Work at the plant drew people from across the country and many drove long distances daily to come in for a shift. F.H. McGraw, the contractor for the plant, published a map detailing driving distances. The longest of these was a 232-mile round-trip from Illinois, which people traveled in a car pool to work a ten-hour shift.[25] The influx of people also created an enormous traffic problem. Cars along U.S. 60, the main road through the area, was bumper-to-bumper most of the time. Traffic in and out of the plant, particularly at shift changes, was phenomenal. An estimated 12,000 cars came to and from the plant every

[24] "The Growing Pains and Successes of a Real Boomtown," *The Paducah Sun*, (19 October 2002), 6; "Paducah Changes its Way of Life," *Life*, vol. 33, No. 2 (14 July 1952), 21-24.
[25] "The Growing Pains and Successes of a Real Boomtown," *The Paducah Sun*, (19 October 2002), 9..

twenty-four hours. The busiest time was in the afternoon when around 8,000 cars poured out of the plant at the end of the day shift. Many secondary roads were still gravel or dirt when construction on the plant began, and dust and mud commonly covered cars and houses. Road improvements came by 1952 as the main access road to the plant and other nearby roads were paved and new arteries were constructed from U.S. 60.[26]

Businesses in the Paducah area also boomed to accommodate the growing population. Retail sales soared, rising from $44 million in 1950 to $94 million in 1953. Businesses expanded and had to hire extra help to meet the growing demand. Banks hired extra clerks in order to process the thousands of payroll checks, as workers lined up for blocks. In 1951 Paducah stores and shops elected to stay open until 8:30 pm rather than the normal 5:00 pm one night a week. Throngs of people mobbed area stores and customers often had to stand in line an hour to get waited on. Several new businesses opened as well. Five new drive-in movie theaters opened in the area, and an eight-store, million-dollar shopping center was constructed. Several individuals opened used car lots, many on the front lawn of their home.[27]

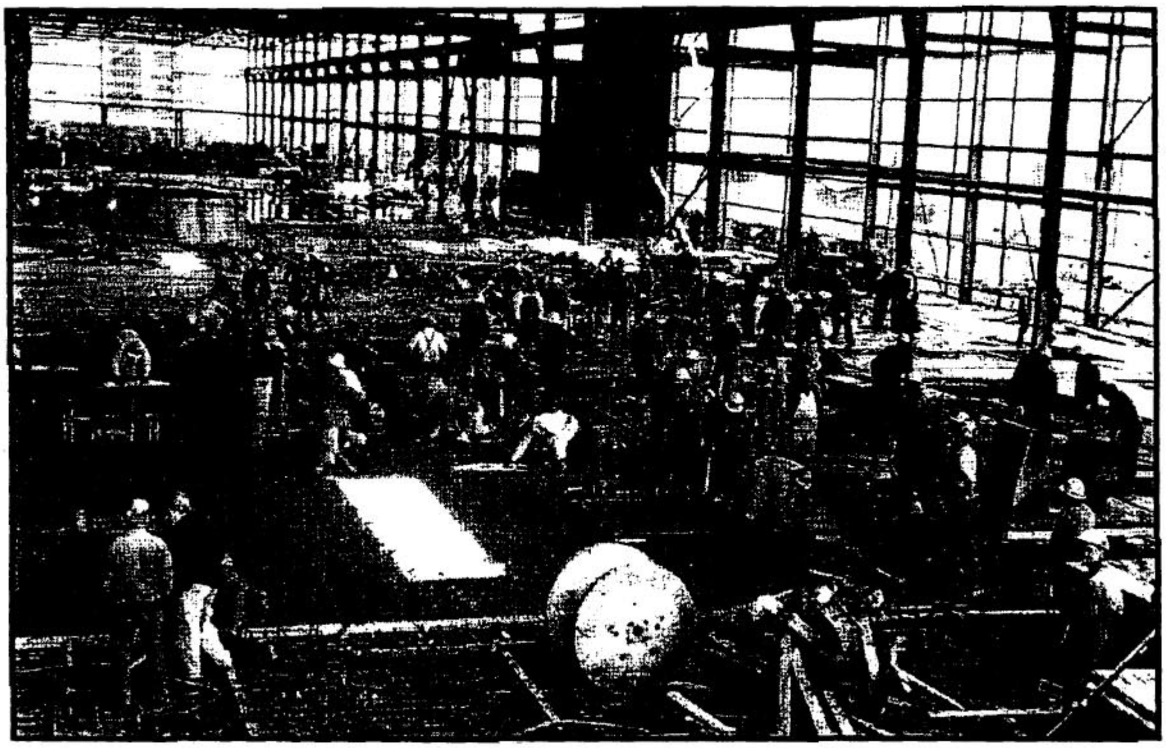

Figure 7: Workers at the Paducah Plant building one of the cascade complex buildings *(photo courtesy of The Paducah Sun 50th Anniversary Insert: Paducah's Atomic Era at 50, October 19, 2002).*

[26] Ibid., 9; *Life*, vol. 33, no. 2 (14 July 1952), 23.

[27] "The Growing Pains and Successes of a Real Boomtown," *The Paducah Sun*, (19 October 2002), 6-9.

The arrival of the plant was often a burden as well as a blessing as almost every aspect of life was affected by the massive influx of people. As one local resident stated: "At first, things did not change. But as the construction got underway, change came with lightening speed. The communities in West McCracken County, and other areas as well, were not equipped to handle all the people, automobiles, housing, etc."[28]

Paducah and McCracken County schools, which were already overcrowded, had to accommodate an additional 4,000 students. Citizens approved a bond issue for school expansion, and a large new high school was constructed in 1953. The AEC established two temporary school buildings in the plant area, both of which were prefabricated metal structures, but the county paid for staff and supplies. The city finally received federal financial aid in 1953 and expansions and improvements were made to several area schools.

Public services such as mail delivery, water and sewer systems, and utility systems were strained and had to be expanded to accommodate the growing population. Local police and fire departments were also enlarged. Paducah's only public hospital, Riverside, also became taxed after a baby boom occurred in 1952. The 110-bed facility overflowed as its patient count rose to nearly 175 per day. Patients were sent home as early as possible, and beds and cots were arranged in hallways and sun porches. A small expansion in late 1952 provided room for ten additional beds, and in 1953 the new Western Baptist Hospital was constructed.[29]

Initial production began at the Paducah Plant in 1952, and the facility was fully completed by 1954 (Figure 8). Before the Paducah Gaseous Diffusion Plant was completed, the U.S. government began construction on a similar plant in Portsmouth, Ohio. Land was purchased for the Portsmouth plant in 1952 and initial operations began in 1954. Peter Kiewett Sons of Nebraska served as construction contractor for the plant, which was completed in 1956. Goodyear Tire & Rubber Corporation was selected to operate and manage the plant.

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[28] "Welcome to the Atomic City," Paducah Gaseous Diffusion Plant promotional brochure, 2002.
[29] "The Growing Pains and Successes of a Real Boomtown," *The Paducah Sun*, (19 October 2002), 9.

Figure 8: Ca. 1955 post card of the PGDP. The location of the C-410 Complex is circled in red *(photo courtesy of Department of Energy)***.**

Enriched uranium from both the Portsmouth and Paducah plants was shipped to Oak Ridge for production of nuclear weapons components. As the Cold War continued, the arms race also escalated as both the United States and the Soviet Union worked to develop the hydrogen bomb. Dubbed the "H-bomb" or "super" bomb because of its potential power for massive destruction, the hydrogen bomb derives its energy from the fusion of hydrogen isotopes. Unlike the fission that uranium isotopes undergo in the development of atomic weapons, which involves the separation of lighter from heavier isotopes, fusion involves the joining together of lighter elements into heavier elements.

In the 1960's the mission of both the Paducah and Portsmouth Gaseous Diffusion Plants shifted to a commercial focus as nuclear energy emerged as an important power source. Civilian energy demands were increasing and nuclear energy helped meet this demand. The two "sister" plants in Ohio and Kentucky worked together to enrich uranium for use in nuclear power plants. In 1984, Martin Marietta Energy Systems, Inc. (later Lockheed Martin) took over operation of the Paducah plant, and in July 1993, the United States Enrichment Corporation, a subsidiary of USEC Inc., assumed operation of both the Paducah and Portsmouth Plants.

As the Cold War waned in the 1980s, the need for enriched uranium lessened. The K-25 plant in Oak Ridge, Tennessee, stopped uranium enrichment production in 1985 and was permanently shut down in 1987. The collapse of the Soviet Union in 1989 led to even further reductions in enriched uranium processing. In 1992, Congress passed the "Energy Policy Act," which established the USEC as a government owned corporation for the purpose of operating the nation's uranium enrichment enterprises. Two years later the Nuclear Regulatory Commission (NRC) was formed to regulate nuclear facilities for public health and safety. In 1996, the president signed into law "The USEC Privatization Act," through which USEC became a private corporation. In May of 2001, the USEC ceased enrichment activities at the Portsmouth, Ohio plant and consolidated its operations at the Paducah site. The Paducah Gaseous Diffusion Plant remains the only such facility in operation in the United States.

Health and environmental concerns about the production of nuclear energy have increased in recent years, and investigations have revealed that some workers at these production plants were unknowingly exposed to dangerous levels of hazardous chemicals and radioactive contaminants. In 1999 a lawsuit was filed claiming environmental mismanagement at the Paducah plant caused serious illness and death among workers. Investigations at the PGDP identified the C-410 Complex as one of the most hazardous and contaminated buildings at the plant (Figure 9).

This contamination resulted from the various processes employed in its use as a feed plant. During its years of operation, a powder form of uranium was transformed into a gas, which was then fed into the plant's cascade system for the diffusion process. The C-410 facility received uranium powder (UO_3) in five-ton containers, which were transferred to the top floor. The powder was then put into feed hoppers. It was then reduced to UO_2 through a reaction with hydrogen gas. The resulting UO_2 was then further processed into UF_4 or green salt.[30] This product was then chemically "cooked" with fluorine prior to being sent through the cascade enrichment system.

The hydrofluorination of UO_2 to green salt was conducted in C-420 in horizontal-screw reactors (Figure 29). Hydroflouric acid (HF) gas was fed countercurrent to the flow of UO_2 powder and the off-gas was diverted via a cyclone separator and carbon tube dust filter to an HF recovery system. This system consisted of two cooling systems to condense the HF vapor into a liquid. The condensed HF was then drained into rubber-lined storage tanks. The UF_4 or green salt was sealed in a hopper and then transferred to a closed conveyor, which carried the powder into a large hopper in C-410 for further processing.

In the next step, UF_4 was converted to UF_6 by fluorination in tower reactors in C-410. The UF_4 was processed with fluorine gas and the resulting UF_6 gas was sent through two cyclone dust separators and then a filter. Cold traps received the UF_6 gas and condensed it into a liquid, which was drained into cylinders. The UF_6 was transferred to the cascade feed facilities in the cylinders. Off-gas from this process was sent to a fluorine clean-up reactor and reprocessed.

The fluorine gas used in the conversion process was generated in C-410. Liquid HF arrived in railcars and was transferred to the C-410 HF storage tanks (Figure 39). This liquid HF was vaporized and then used in the process of converting UO_2 to UO_4 and was routed to the fluorine production cells for conversion into fluorine gas and hydrogen gas via electrolysis. The resulting fluorine gas was used to convert UF_4 into UF_6.

The recycling and reactivation of spent fuel from weapons reactors also took place in the C-410 Complex and added to the contamination. Other DOE sites processed fuel rods from spent fuel and then shipped the resulting powder to the Paducah plant. The C-410 feed mill received the powder material and fed it into the enrichment process. The fuel rods had absorbed plutonium and neptunium as well as other hazardous materials. Most, but not all, of these products were removed during the initial processing stages at either Hanford or Savannah River. The government stopped the procedure of recycling spent nuclear fuel in 1977.[31]

[30] "Engineering Evaluation/Cost Analysis for the C-410 Complex," 1-11.

[31] *Ibid.*

The C-410 Complex of the Paducah Gaseous Diffusion Plant was in operation through 1964. After being placed in standby for a few years, the facility was restarted in 1968 and operated until it was shutdown in 1977. Four cells within the Complex continued operation until 1994, when all production in the complex ceased. Since that time, through 2001, the facility has been inactive. Beginning in 2001, the DOE initiated planning and CERCLA regulatory documentation development for the decontamination and decommissioning of the C-410 Complex. In 1994, DOE commissioned an environmental study of the C-410 Complex. This study, "Level III Baseline Risk Evaluation for theC-410 Complex at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky," concluded that the C-410 Complex poses a health risk to workers and the general public and its demolition is warranted.

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C-410 Complex Architectural Description:

The C-410 Feed Plant complex was constructed in a series of phases between 1953 and 1957 (Figure 10). The main C-410 building and its expansions were designed by Singmaster & Breyer, Engineers of New York. The original section of the complex constructed in 1953 consists of the existing central portion of C-410, the HF neutralization building (Building C-410-C), the neutralization (sludge) lagoon (C-410-B), a hydrogen holding tank, a concrete holding basin (C-410-E) and four HF storage tanks (C-410-F, -G, -H, and -J). After placing the building in operation it was determined that its original size was inadequate and the building was expanded to the east and west in 1954 and 1955. The east expansion was built to contain two additional cell rooms and related operations while the west expansion was built as a hopper storage area. During these years a second phase east expansion was also constructed which held an additional cell room and transformer room. In 1956, Building C-420 was constructed consisting of a multi-story tower of steel framing and a one-story concrete block wing. The Giffels & Vallet, Inc. of Detroit designed Building C-420. Another addition, Building C-411, was added to the east façade of the complex in 1957 to house a cell maintenance area.

The overall construction of the facility was consistent throughout its expansion in the 1950s. The foundations of the plant are of poured concrete, and the ground story is largely of concrete block construction. The upper façade consists of a structural steel framework with an exterior siding material of Transite. Roofs are flat and of gravel and tar material.

Transite is a trade name for asbestos reinforced Portland cement sold as a pre-cast corrugated sheet. It was widely used in the United States in the 1940s and 1950s for both wall siding and sloped roofing materials. It was especially popular for buildings which contained heat generating operations because of its fire resistant properties. Normally not coated, it was allowed to weather naturally. Despite their age, Transite panels have generally retained their structural integrity.

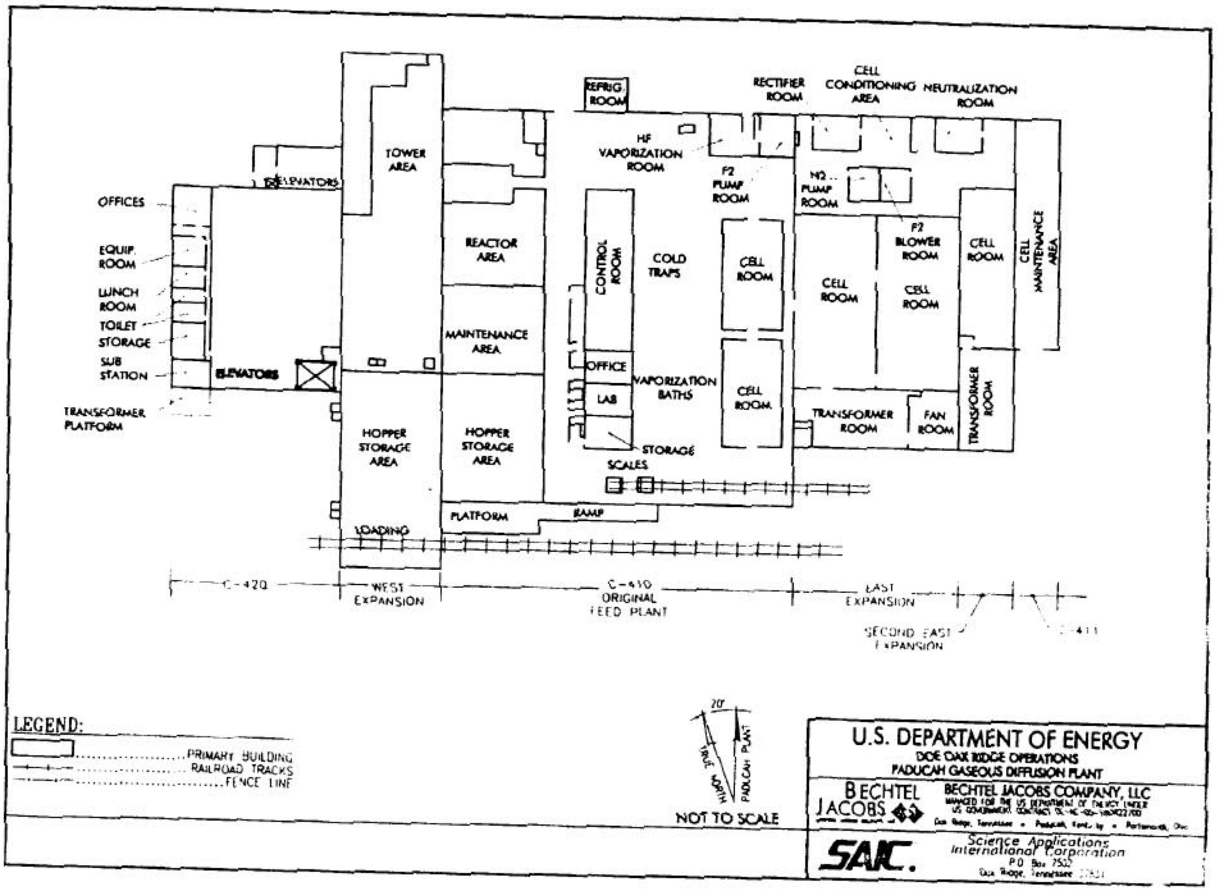

Figure 10: Floorplan of the C-410 Complex showing each section as it was built or expanded.

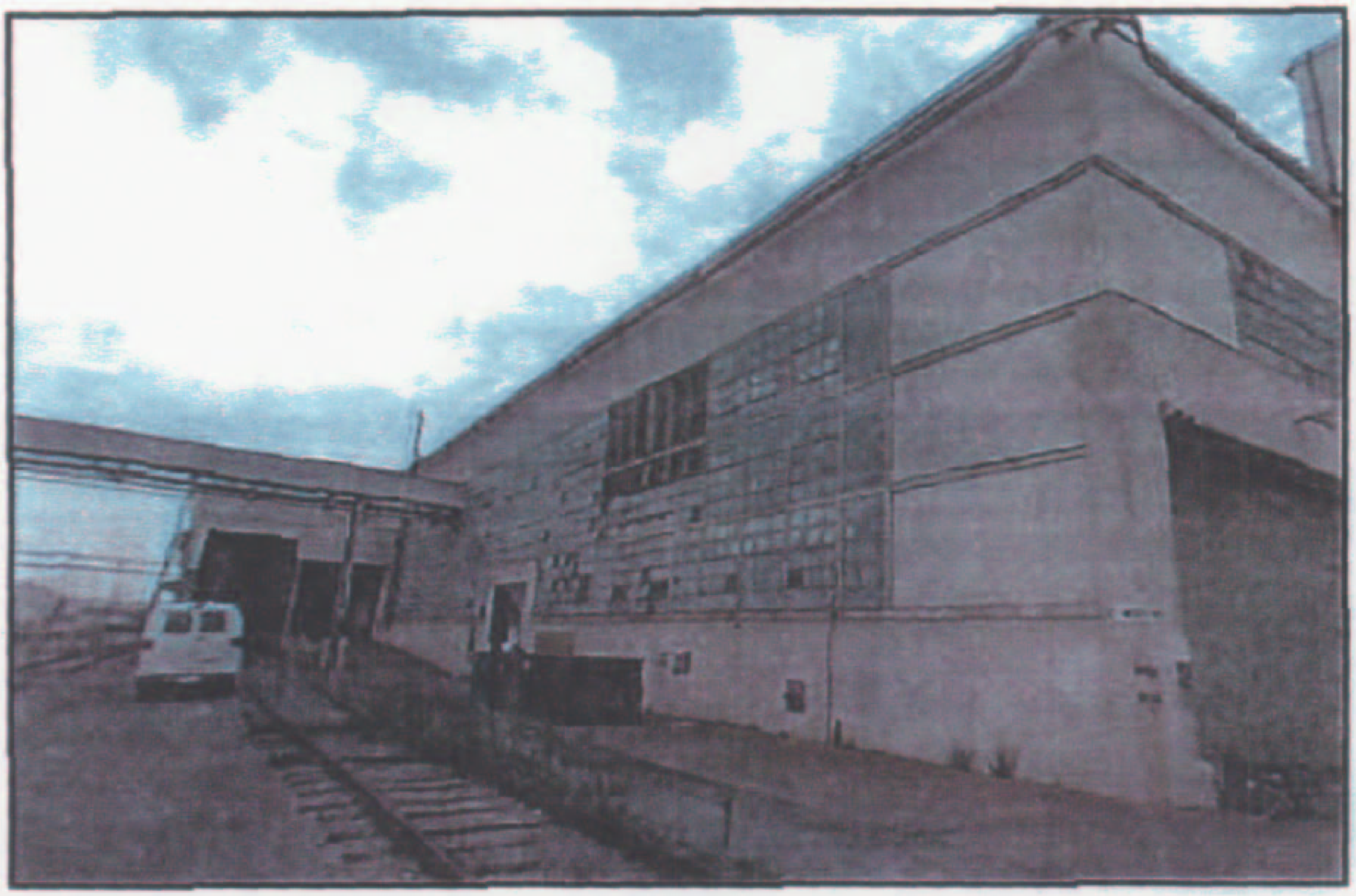

Figure 11: Original center section of Building C-410. This view is of the south facade towards the northwest. Visible at left is the loading dock and platform.

Building C-410:

The original section of Building C-410 was completed in 1953 and was designed with a poured concrete foundation, a first floor of concrete block construction, an upper façade of steel framing with a Transite exterior surface, and a flat roof of gravel and tar. The west and east facades of this original building were later expanded through additions and only the north and south facades of this original section are visible. The south façade of C-410 has a four-story projecting wing containing a loading dock and concrete platform. The east elevation of this projecting wing has a large garage bay accessed by railroad tracks. This garage bay has an original overhead track, steel roll-up door. On the upper façade of the projecting bay are large hooded vents and window openings which have been covered with aluminum panels. Opening onto the concrete loading dock and platform on the south façade is a garage bay which contains an original overhead track, steel roll-up door. The roof of the loading dock bay has a steel truss and metal panel ceiling. Connecting the loading dock platform to the to the ground level is a concrete ramp with a steel pipe railing.

To the east of the loading dock bay, the south façade of C-410 has a first floor of poured concrete and an upper floor of steel frame and Transite panels. The first floor of the building has an original two-light steel and glass pedestrian door and a garage bay entrance with ca. 2000 metal double doors. The upper façade of this elevation has a continuous window wall set within the Transite panels. The windows are of steel construction and have alternating bays of fifteen-light and ten-light design. This design is repeated for twenty-six bays across the width of the façade. The ten-light windows are fixed while the fifteen-light windows have inset panels of six-light awning design. Some sections of the windows have been covered with aluminum panels. The windows have opaque lights and it is unclear if they were originally installed in this fashion or were acid-etched over time from the HF process. At the southeast corner of Building C-410 is a large garage bay which is accessed by a concrete driveway and railroad tracks. This garage bay has an original steel, overhead track door. The upper façade above the garage bay has three original fifteen-light windows set within Transite panels.

Figure 12: The south facade of the original section of C-410 showing the original window wall.

Figure 13: North facade of C-410 showing its original window wall and concrete block refrigeration wing.

The north façade of the original section of Building C-410 has a one-story, poured concrete first floor and upper façade of Transite panels. The first floor of this façade has two garage bays; the east garage bay has an original overhead track, steel, roll-up door while the west garage bay has ca. 2000 steel double doors. On the upper façade set within the Transite panels is a continuous window wall of thirty-six bays. The windows are ten-light and fifteen-light steel and glass design. The ten-light windows are fixed while the fifteen-light windows have inset panels of six-light awning design. Attached to the north façade of this section is an original one-story, concrete block refrigeration wing. This wing has a flat roof of gravel and tar, a poured concrete foundation, and walls of concrete block. On the west façade of this wing is an original steel, roll-up door.

The interior of the building consists of a concrete floor, metal paneled ceiling, and walls of steel frame and Transite panels. The interior houses control panels and machinery associated with the feed plant operations.

Figure 14: C-410 Operational Control Area for both F2 and UF6 production located on the 1st floor of Building C-410.

Figure 15: C-410 Operational Control Area for both F2 and UF6 production located on the 1st floor of Building C-410.

Figure 16: Quality Control Lab for the complex located on the 1st floor of the C-410 building.

Figure 17: Cell Servicing Area-F2 Cell Fill Area located on the 1st floor of C-410.

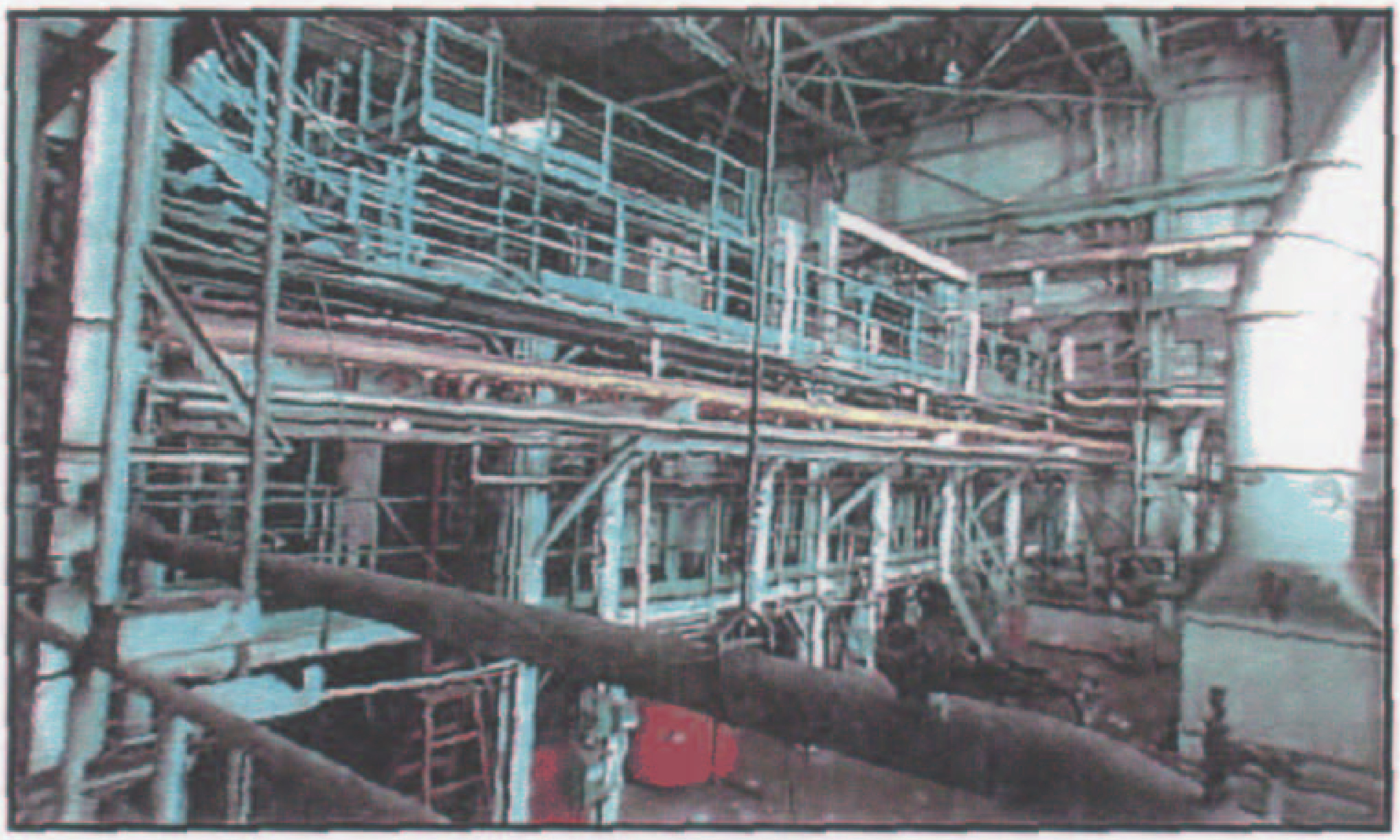

Figure 18: Refrigeration Area located on the 1st floor of C-410.

Figure 19: Upper Alco Cold Trap Area located on the Mezzanine floor of Building C-410. View is to the north with the large bank of windows in the distance.

Figure 20: Original section of Building C-410, and the three- and one-story story East Expansion wing.

Building C-410, East Expansion:

The East Expansion section of Building C-410 was designed with a three-story bay of concrete block and Transite panels and a one-story wing of concrete block. Both of these sections have poured concrete foundations and flat roofs of gravel and tar. The three-story section has a first floor of concrete block which contains an original, two-light steel and glass pedestrian door. On the upper façade are original fifteen-light steel and glass windows set within Transite panels. On the second floor of this bay is an original pedestrian door of similar design which opens on the roof of the one-story concrete block wing. The one-story concrete block wing of the East Expansion has an original, two-light steel and glass door and two garage bay entrances with original steel, roll-up overhead track doors. Also on this façade are four louvered vent openings which have been covered with aluminum panels.

The east façade of the East Expansion has one section which is still visible while the rest of the façade was incorporated into the Building C-411 of 1957. The visible section of the east façade has four louvered vents which have been enclosed with aluminum panels. The north façade of the East Expansion of Building C-410 has two large HF exhaust vents. These vents merge into a steel exhaust stack which is supported by steel platforms resting on concrete piers.

The interior of the building has a concrete floor, concrete block and steel frame walls, and a steel paneled ceiling. The interior is composed of open floor space containing cells and other machinery.

Figure 21: North facade of East Expansion of Building C-410.

Figure 22: F2 Cell Room located in the Second East Expansion of the C-410 Building.

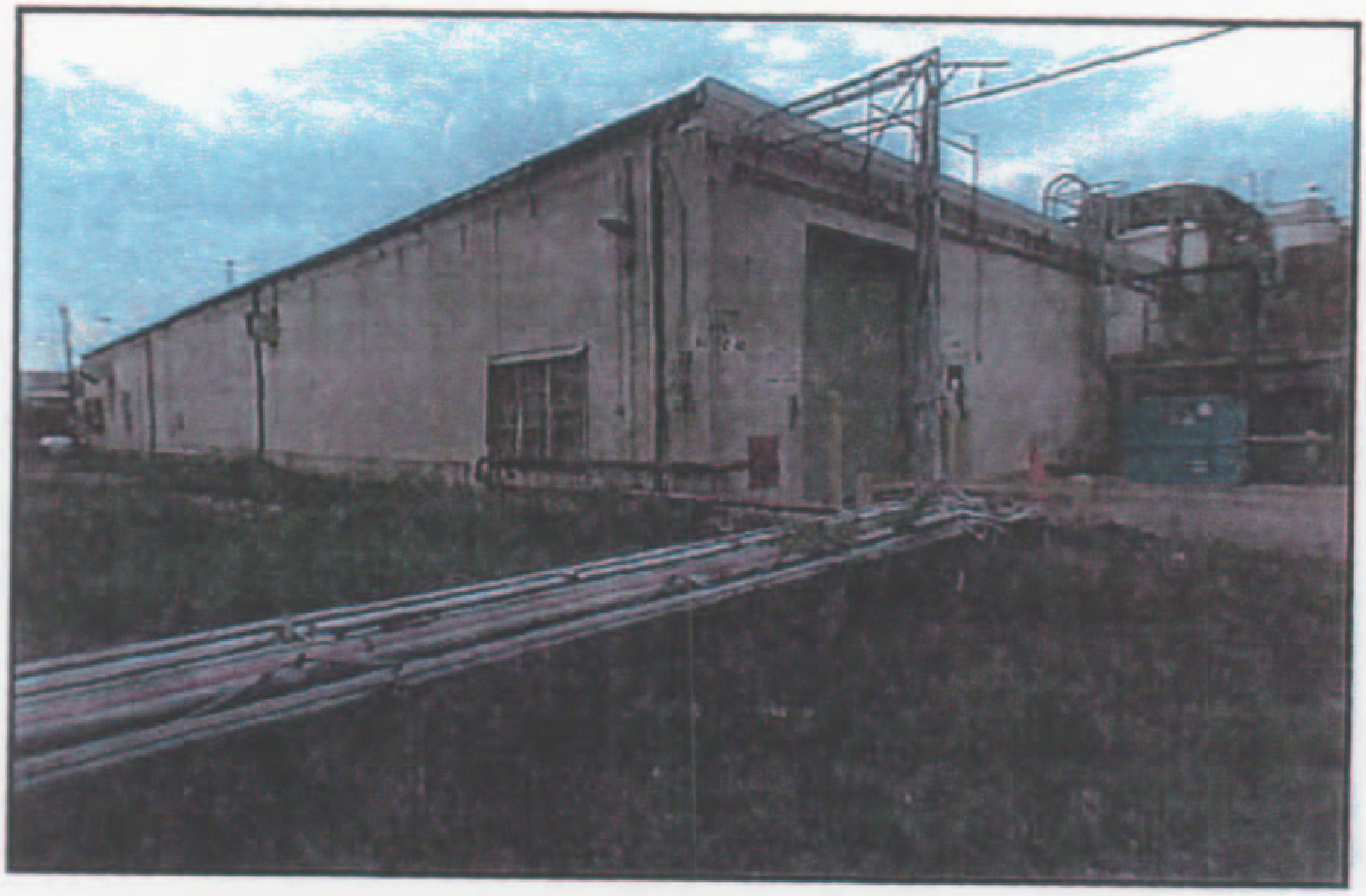

Figure 23: Building C-411- North and East facades.

Building C-411:

Building C-411 is a one-story concrete block wing which was built on the east façade of the East Expansion in 1957. The west wall of Building C-411 is attached to Building C-410 while the other facades remain visible. The south façade has a garage bay entrance with ca. 2000 steel double doors. A pedestrian entrance on this façade has an original two-light, steel and glass pedestrian door. The east façade of C-411 has three original twelve-light steel and glass windows with inset panels of six-light awning design. Also on this façade are two exhaust vents now covered with metal panels. The north façade of Building C-411 has a garage bay entrance of metal double doors added ca. 2000, and an original two-light, steel and glass pedestrian door.

The interior of the building has a poured concrete floor, walls of concrete block and a steel paneled ceiling. The interior consists of open floor space containing machinery and equipment for cell maintenance operations.

Figure 24: Building C-411 – East and South Facades

Figure 25: Building C-410, West Expansion.

Building C-410, West Expansion:

The West Expansion section of Building C-410 was built in 1956 and designed with similar detailing to the original C-410 Building. This includes a poured concrete foundation, first floor of concrete block construction, upper façade of steel framing with a Transite exterior surface, and a flat roof of gravel and tar. The west façade of the west expansion section has one garage bay entrance and two pedestrian entrances. The garage bay has a ca. 1970 steel, roll-up door and the pedestrian doors are both original two-light steel and glass design. Both doors are above-grade on the first floor level and are reached by concrete stairs and a steel pipe railing. On the upper façade of the west elevation is one original, six-light steel and glass awning window. The north façade of the West Expansion is an original two-light, steel and glass pedestrian door. The upper façade has no fenestration except for three louvered vents which have been covered with aluminum panels.

On the west façade of the West Expansion is a ca. 1957 wing designated as Building C-410-1. This wing is a covered loading dock bay. This loading dock has a concrete foundation, roof and walls of steel panels, and is supported by steel piers.

The interior has a poured concrete floor and ceilings of steel frame and metal panels. The first floor is of concrete block and the upper floors are of steel frame and Transite panels. The interior contains machinery associated with the hopper feed process.

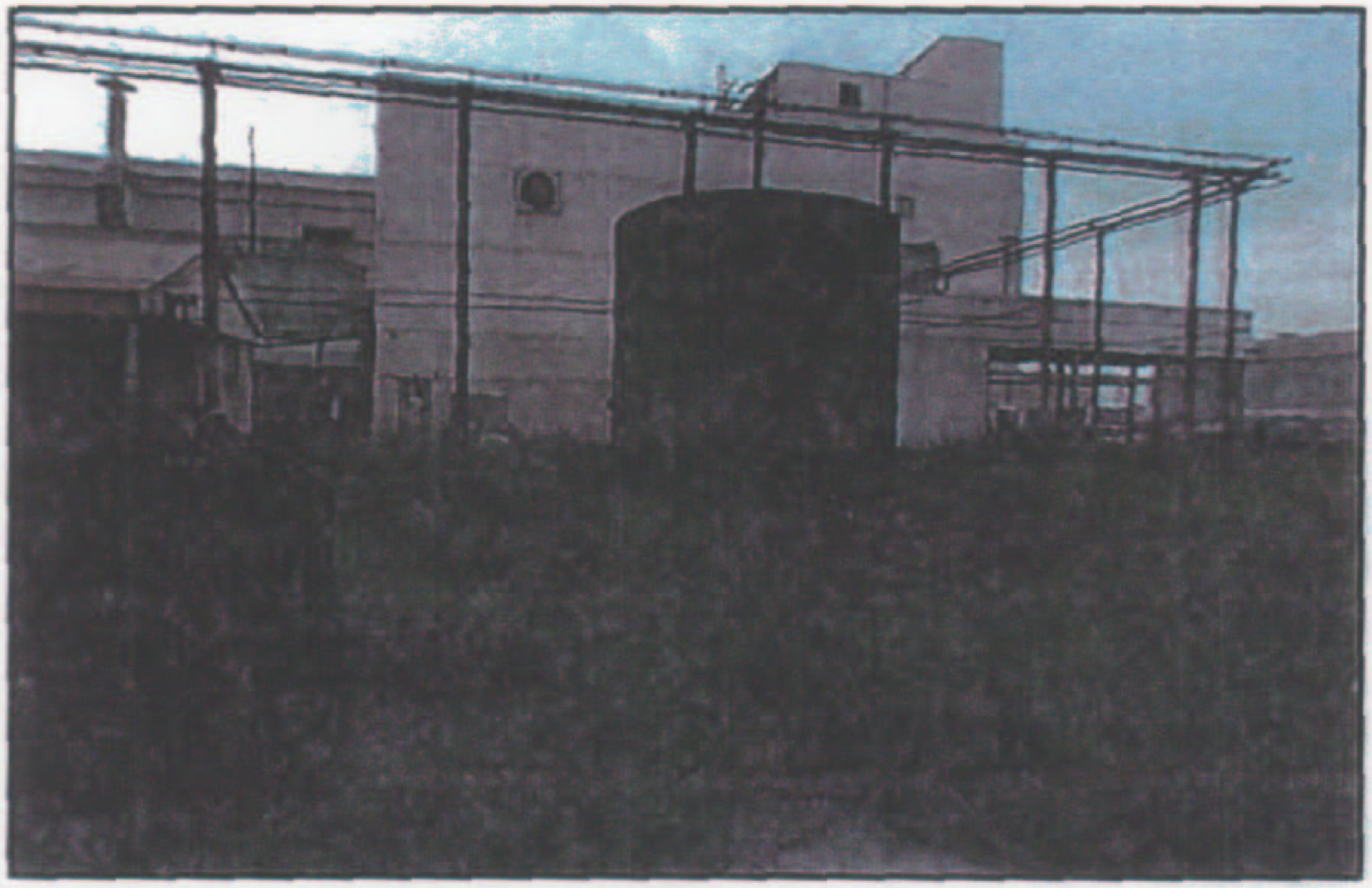

Figure 26: North facade of the West Expansion of Building C-410. In the foreground is the steel hydrogen holder tank.

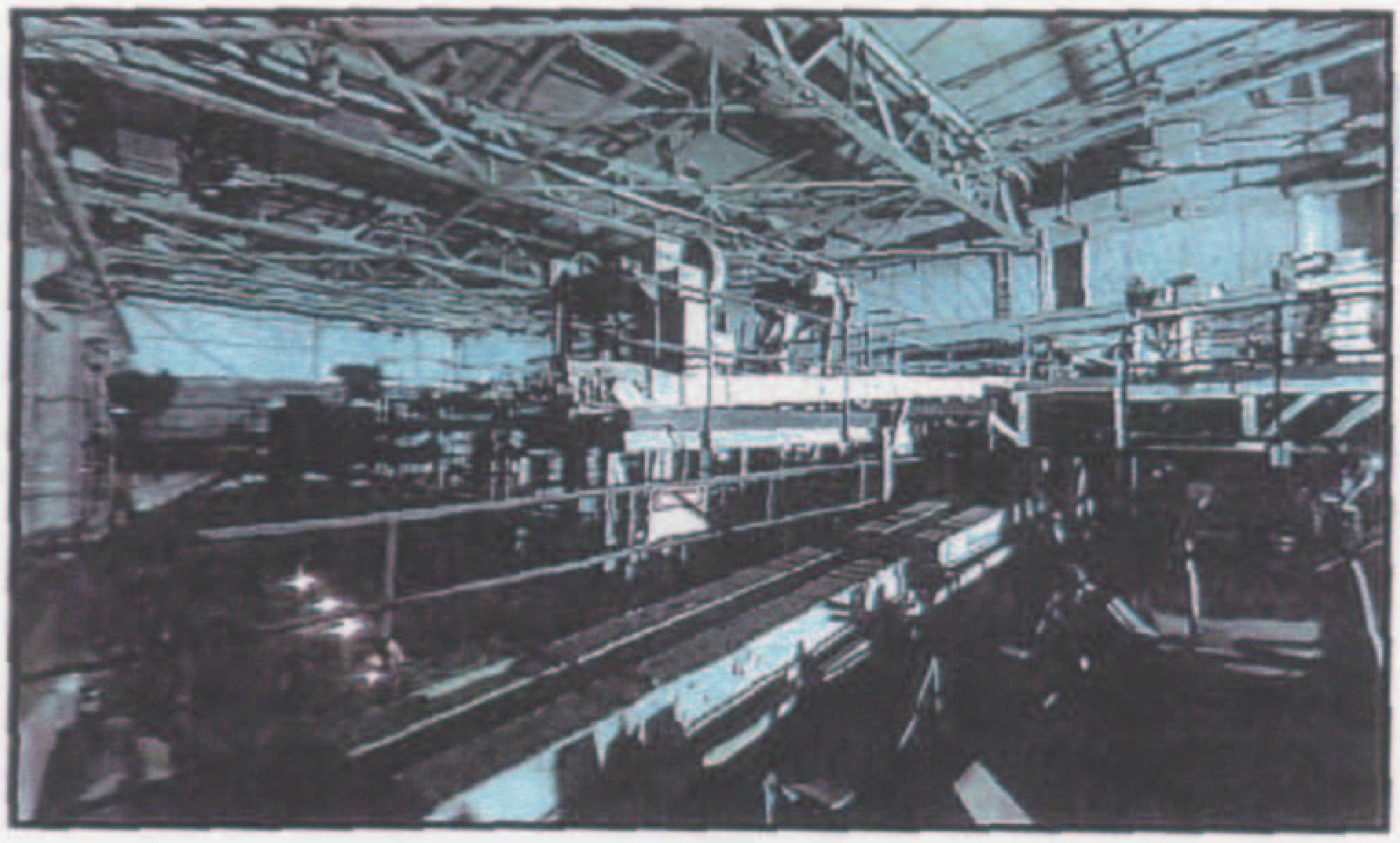

Figure 27 Interior view of the 2nd Floor of the West Expansion Tower of Building C-410.

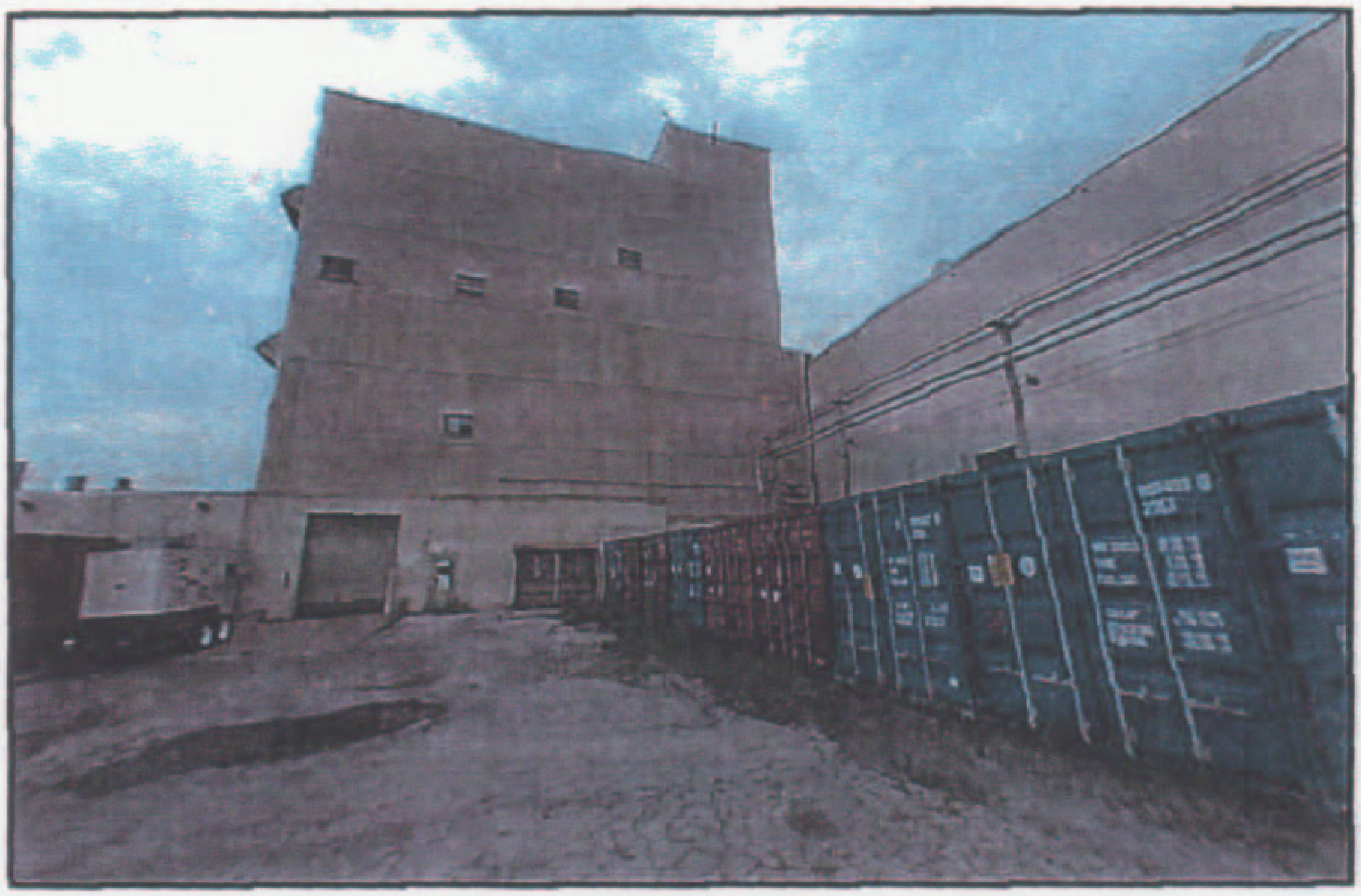

Figure 28: South facade of the seven-story section of Building C-420.

Building C-420

Building C-420 was constructed in 1956 to adjoin the west expansion section of the original C-410 building. The building consists of a seven-story section with a one-story concrete block wing on the west façade. The seven-story section has a poured concrete foundation and a first floor of concrete block construction. Above the first floor is a six-story tower of steel frame construction and an exterior of Transite panels. The roof is flat with a tar and gravel surface. The first floor of the south façade on has a garage bay entrance and a pedestrian entrance. The garage bay has an original overhead track, steel roll-up door. The pedestrian entrance has an original two-light steel and glass door. On the upper floors of this façade are several original four-light steel awning design windows. The third floor has one window, three windows are on the fourth floor, and one window is on the fifth floor. At the southeast corner of the building is a raised penthouse section containing an elevator shaft and equipment.

The north façade of the six-story section of Building C-420 has a pedestrian entrance with original double doors of two-light steel and glass design. Also on this façade is a garage bay with ca. 2000 steel double doors. On the upper façade is a series of exhaust vents and original four-light, steel and glass awning windows. On the third-story is an entrance with original three-light, paired steel and glass doors. These doors are located just below the remnants of a steel hoist and pulley system which brought materials to this location for access into the upper floors. On the west façade of the six-story elevator section are original four-light steel windows on each floor except for the sixth floor. The west elevation of Building C-420's six-story section has one original four-light steel window and four hooded exhaust vents. This façade has no other fenestration.

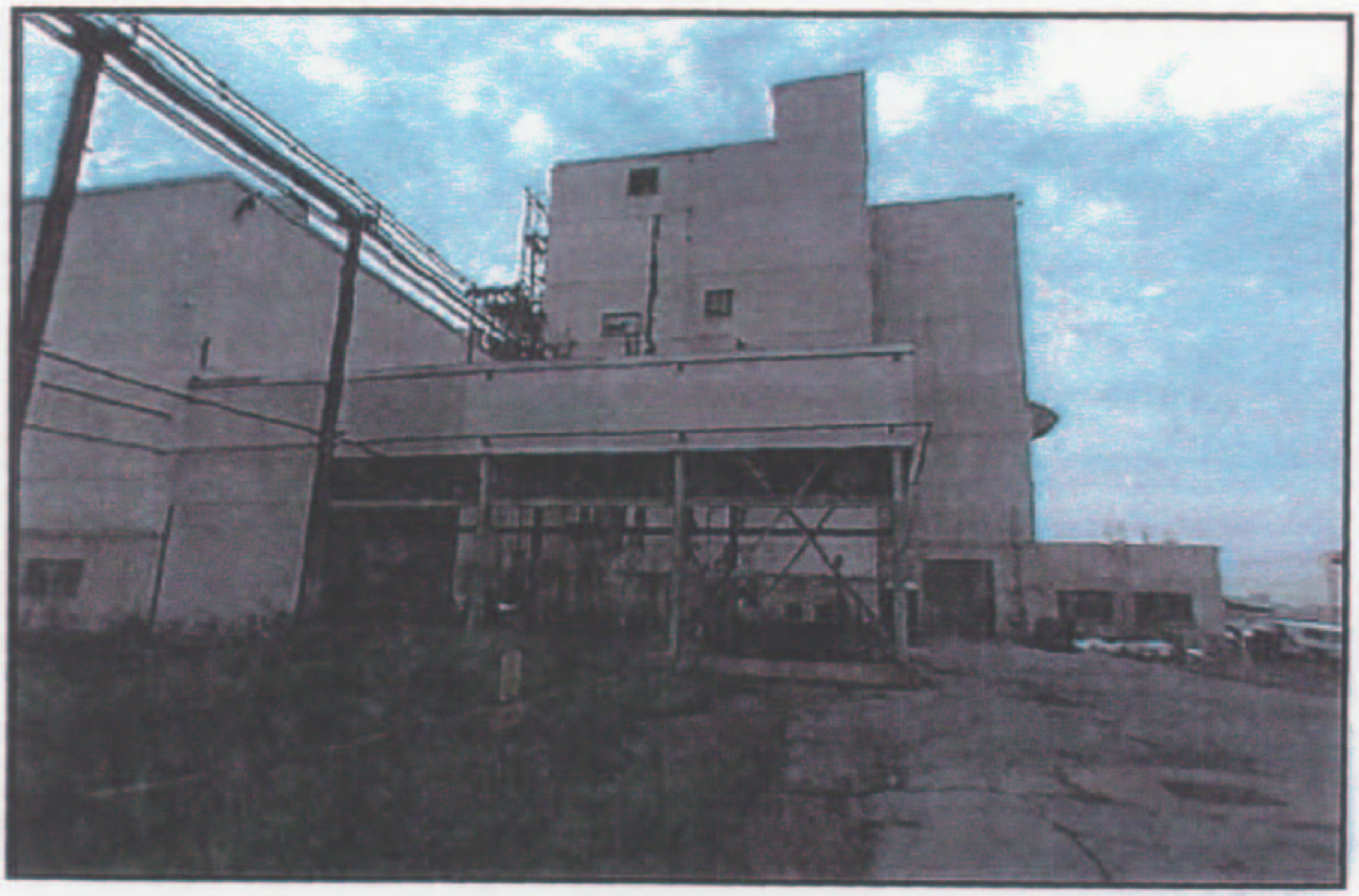

Figure 29: North facade of Building C-420 showing the seven-story section and the one-story office wing.

In addition to the six-story section of steel frame and Transite, Building C-420 also has a one-story concrete block wing on the west elevation. This wing has a poured concrete foundation, flat roof of gravel and tar, and exterior walls of concrete block. The north façade of this wing has two original twelve-light steel and glass windows with six-light, inset awning panels. The west façade has seven window bays which contain similar design windows and all of the windows in this wing have poured concrete sills. The west façade also has an original two-light, steel and glass pedestrian door. The south façade of the concrete block wing has two exhaust vents but no other fenestration.

The interior of the one-story office wing is partitioned into various office and equipment rooms. Walls are of concrete block and ceilings are of acoustical tile. Floor surfaces include concrete and linoleum. The seven-story section has a concrete block first floor and upper facade of steel frame and Transite panels. Floors and ceilings are of metal panels and this section contains various equipment rooms, control panels, and machinery and equipment associated with the feed mill process.

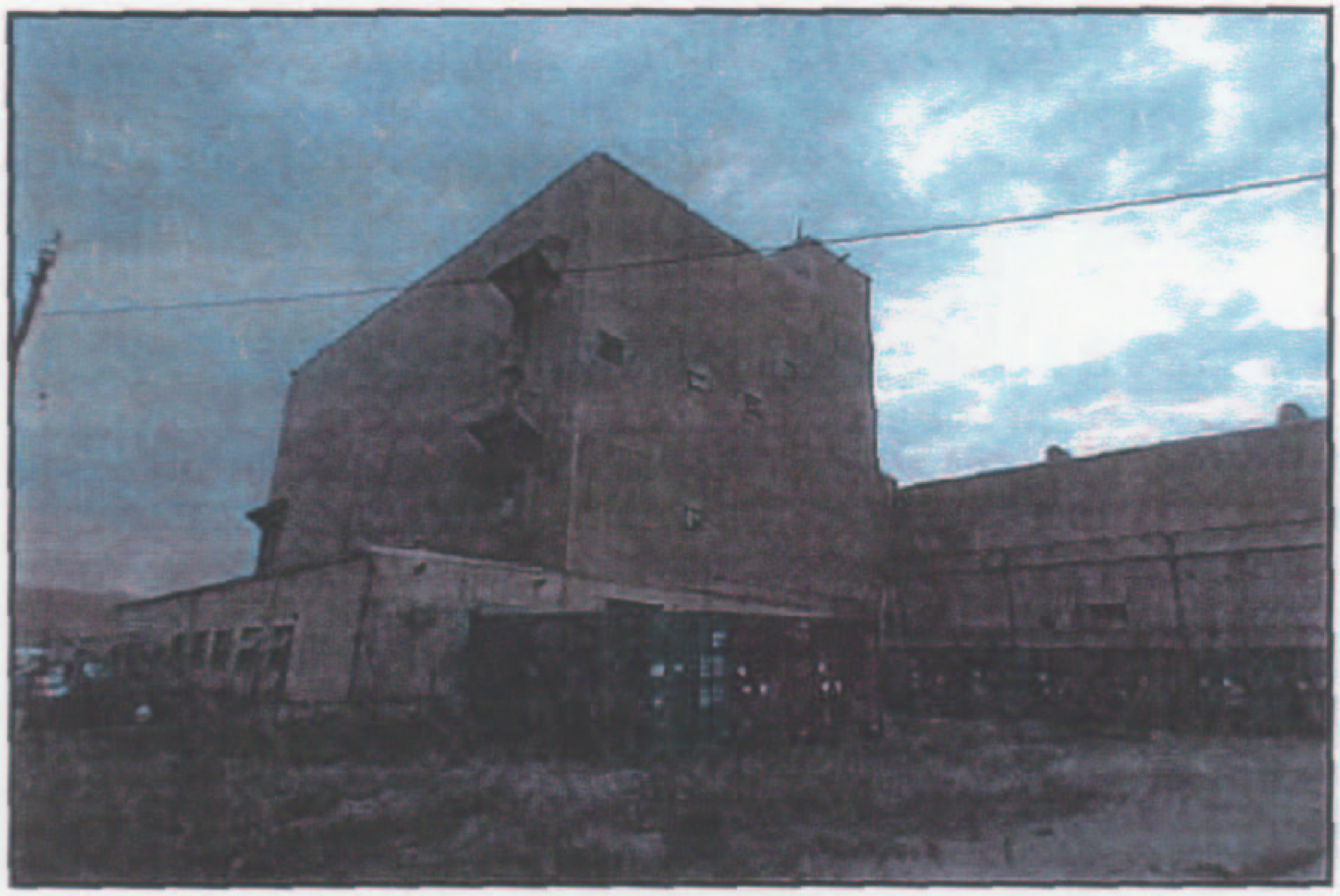

Figure 30: West and South Facades of Building C-420.

Figure 31: Interior view of the Building C-420 Office Area, Break room and Restroom area for C-420 Workers and is located on the 1st floor of the building.

Figure 32: Maintenance Shop located on the 4th floor of Building C-420.

Figure 33: Operational Control Center for the C-420 facility located on the 2nd floor of the building.

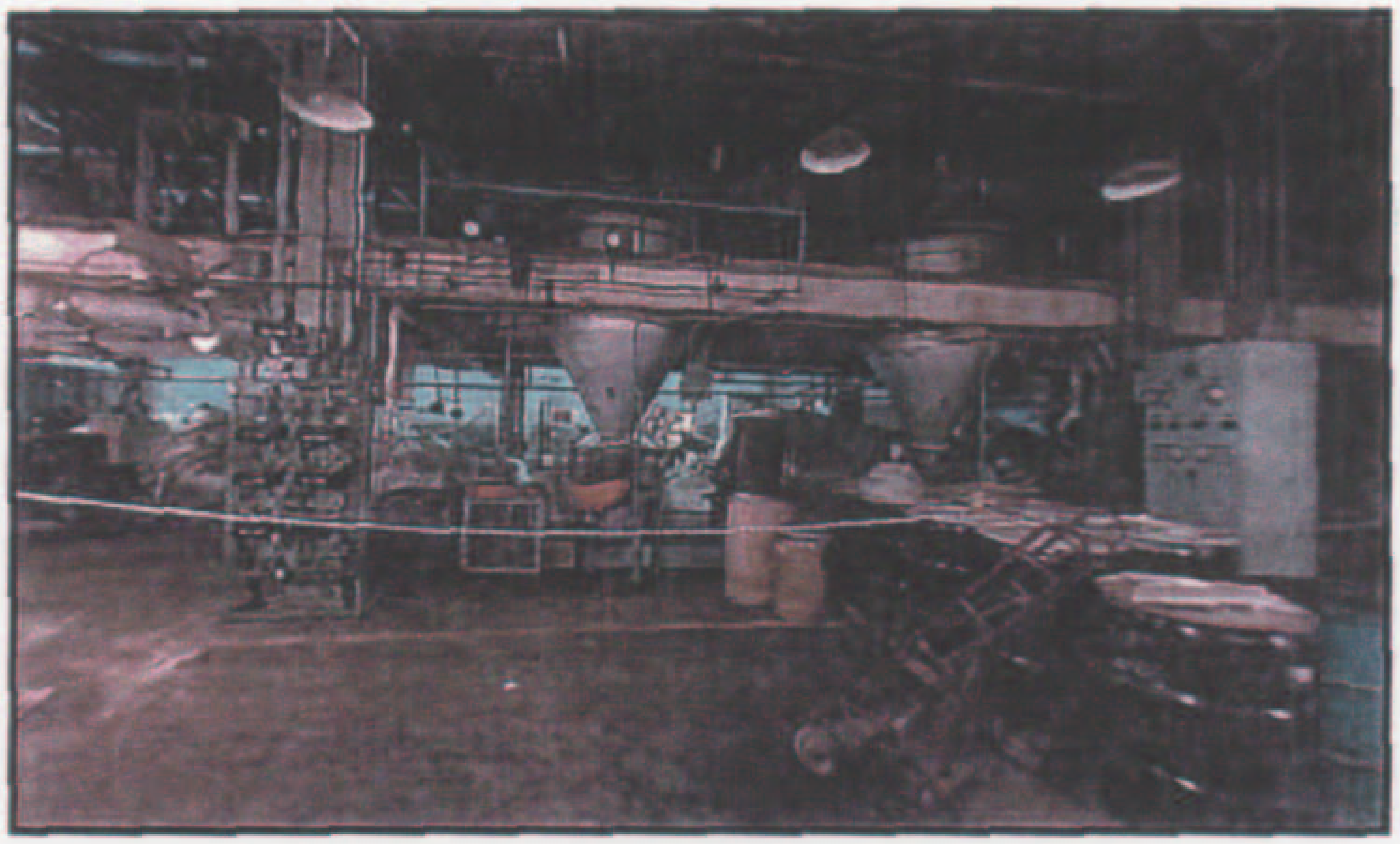

Figure 34: **UF4 Transfer Area housed the UF4 Storage/Transport Equipment located on the 1st floor of Building C-420.**

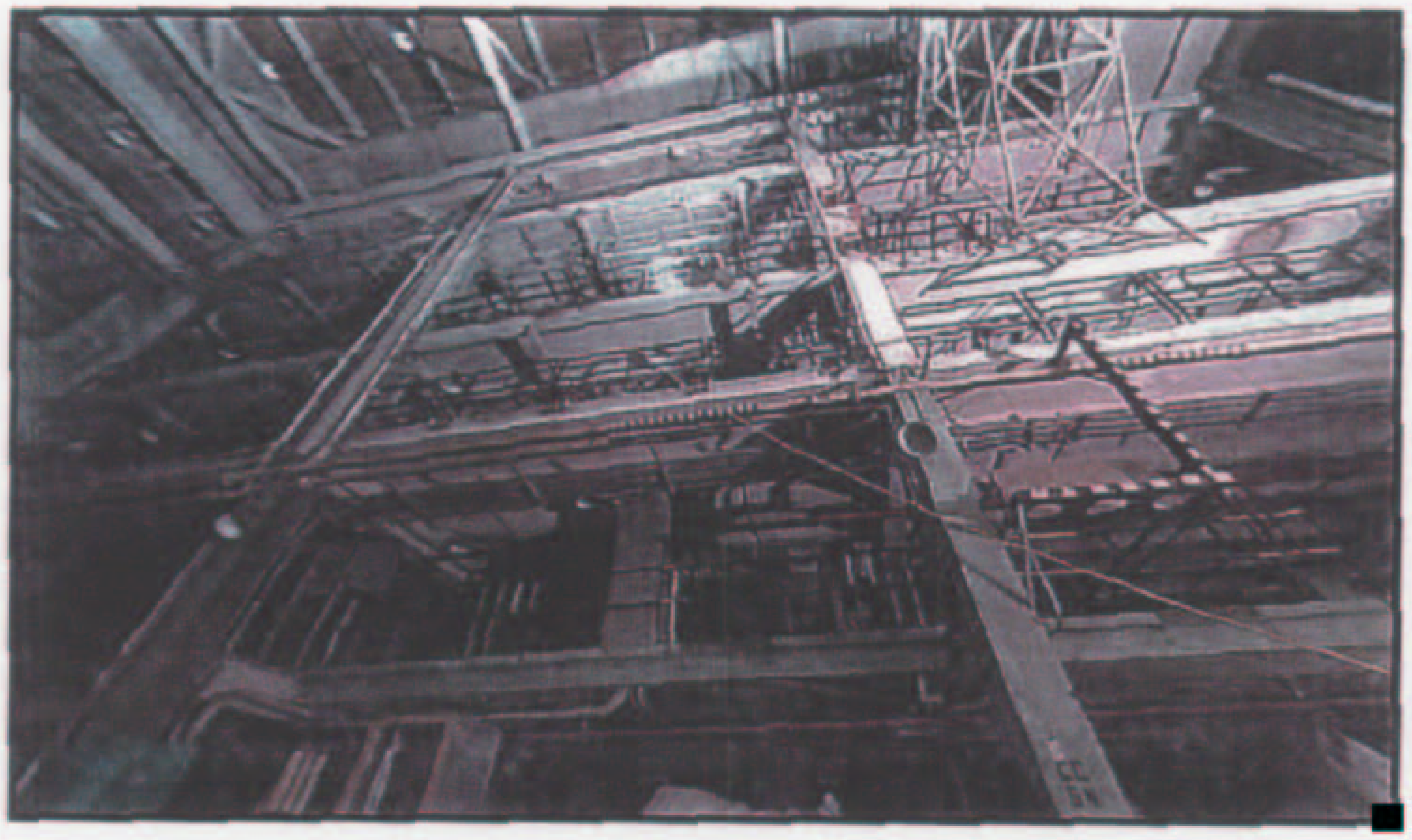

Figure 35: **Truck Alley/Crane Bay is located on the 1st floor and provided access to all the floors within the C-420 Building except the top floor.**

Figure36: Elevator Access/Storage Area located on the 2nd floor of C-420.

Figure 37: Upper HF Reactor Area located on the 3rd floor of Building C-420.

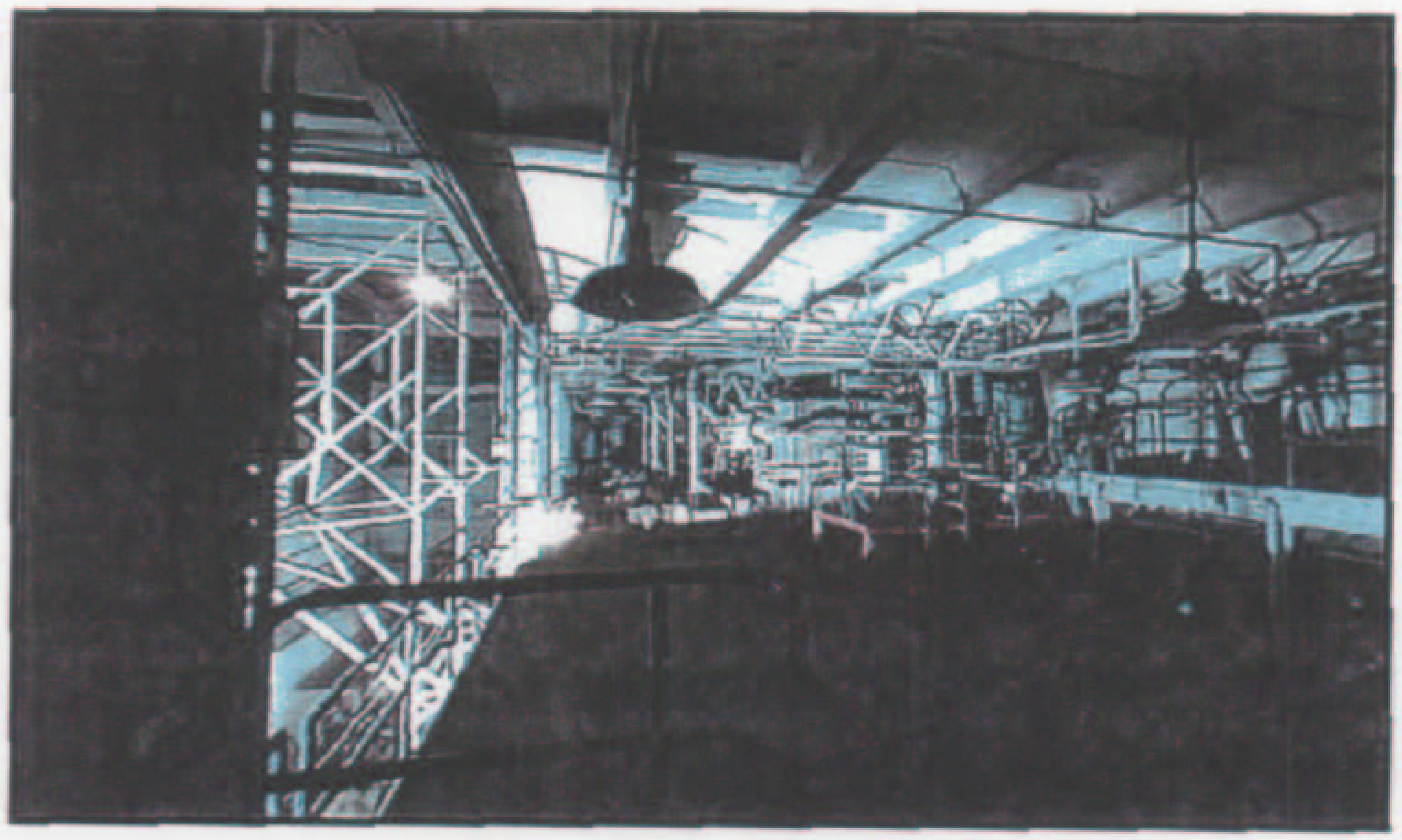

Figure 38: Elevator Access/Ventilation Area located on the 3rd Floor of Building C-420.

Figure 39: HF Storage Tank Farm-view to the east.

HF Storage Tank Farm, C-410-E, -F, -G, –H, and -J:

To the northeast of Building C-410 are nine hydroflouric acid (HF) storage tanks that were installed in 1953 (C-410-F, -G, -H, and –J). Each tank is cylindrical in shape and rests on steel and concrete posts. The tanks are arranged in a north/south row. The tanks are interconnected via steel pipes and are reached by steel stairs and catwalks. There are two pairs of tanks which are set beneath steel, gable roof shed enclosures. These sheds have crimped steel roofs, steel walls, and are on raised steel posts. Beneath each pair of tanks throughout the tank farm are rectangular concrete containment bays to prevent tank leakage into the ground. Above each tank are shower heads to provide water cooling of the tank surfaces during periods of extreme heat.

North of the storage tanks is a rectangular concrete holding basin (C-410-E).

Figure 40: Tank Farm –view to the northeast.

Figure 41: Interior of one of the HF Tank Farm Buildings.

Figure 42: Building C-410-C, view to the southwest. To the north of the building is the C-410-B Neutralizer (sludge) Lagoon which is bounded by the steel pipe railing. In the distance is the steel hydrogen holder tank.

Building C-410-C:

Building C-410-C was constructed in 1953 as an HF neutralizer building. The building is of steel frame construction and has a poured concrete foundation, a gable roof of Transite panels, and an exterior also of Transite panels. On the east façade of the building is an original garage bay entrance with a steel, overhead track, roll-up door. The south façade has two original, nine-light steel and glass windows with inset six-light awning panels. On the north façade of the building is an incised bay with an original two-light steel and glass pedestrian door. On the west façade is an original nine-light steel window with an inset six-light awning panel.

Hydrogen Holder:

Another contributing structure to the complex is the cylindrical steel tank designated as the hydrogen holder. This tank held hydrogen used in the feed plant operations. It was installed in 1956.

Figure 43: C-410-B, Neutralization Lagoon. The lagoon is in the grassy area in the left of the photo.

C-410-B, HF Neutralization Lagoon:

To the north of Building C-410-C is a rectangular, concrete block neutralization lagoon built in 1953. This lagoon is a 1,940 square foot, at-grade impoundment that is about two-feet deep with an earth/clay floor and reinforced concrete walls. It was used for the lime neutralization of HF cell electrolyte.

V. NATIONAL REGISTER EVALUATION OF THE C-410 COMPLEX

The Paducah Gaseous Diffusion Plant was constructed in the early 1950s in response to national security demands brought on by the Cold War. The inability to reach an agreement on international nuclear arms control resulted in strained relationships between the United States and the Soviet Union following World War II. Distrust between the two nations mounted and both responded by accelerating the development of nuclear weapons. The method of gaseous diffusion had proven to be the most effective method of uranium enrichment, and in an effort to build up its nuclear production, the United States established the Paducah, Kentucky, and Portsmouth, Ohio, gaseous diffusion plants in addition to its existing K-25 plant in Oak Ridge, Tennessee.

The United States government established the Paducah Gaseous Diffusion Plant in the early 1950s to produce enriched uranium for the production of nuclear weapons, which were deemed necessary for national defense. The Cold War lasted until 1989 with the collapse of the Berlin Wall and the dissolution of the Soviet Union into separate nations. During this period, the Paducah plant along with its sister plant in Portsmouth, Ohio, and the original K-25 plant in Oak Ridge, were the only sources for uranium enrichment in the United States. These three plants played a significant role in the nation's defense efforts of the Cold War era.

The main processing building at the K-25 plant has been identified as eligible for National Historic Landmark status due to its role as the prototype plant of its kind. Built in the 1940s as part of the Manhattan Project, K-25 served as the developmental site of the gaseous diffusion process in the United States. In addition to the landmark K-25 Building, much of the rest of the plant area has been determined to meet National Register criteria as an historic district. Operations at K-25 were shut down in the 1980s.

The Paducah and Portsmouth plants were constructed in the early 1950s and used the same technology developed at the K-25 site. Although not significant on a national level as the K-25 plant, the Paducah and Portsmouth facilities are significant at a local and state level for their role in the Cold War. These unique facilities provided key elements of national defense and spurred regional development. Throughout the 1950s and 1960s each plant enriched uranium primarily for the production of nuclear weapons. During the 1960s, increasing energy needs led to the use of nuclear energy for civilian use, and the focus of both the Paducah and Portsmouth plants shifted to the production of enriched uranium for commercial energy consumption. The Ohio SHPO has determined that the Portsmouth Gaseous Diffusion Plant is eligible for the National Register of Historic Places for its Cold War significance.

In January 2003, the Consultant conducted a reconnaissance level survey of the PGDP. The plant retains much of its original 1950s footprint including the four main processing buildings in which the gaseous diffusion process took place. These four buildings and adjacent support buildings and structures comprise a potential National Register Historic District (Figure 44). The district would be eligible under National Register Criterion A for its military significance during the Cold War. As one of only three such plants in the United States, the Paducah plant was an important component of the country's national defense efforts during this period, particularly during the 1950s and 1960s. The majority of the buildings retain much of their architectural integrity from this period.

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In the next two years, an overall cultural resources survey of the PGDP will be completed. Further research conducted as part of this project is likely to reveal sufficient data to qualify the district for its significance in state and local social history as well. The establishment of the gaseous diffusion plant greatly altered the economic and social fabric of Paducah and surrounding counties. The development of the plant spurred subsequent support industries, including two large power plants, and brought tremendous employment opportunities to the region. Local populations boomed and commercial development multiplied. The Paducah Gaseous Diffusion Plant has been the one of the most influential developments in the Paducah area during the 20^{th} century.

The boundaries of the potential historic district at the Paducah Gaseous Diffusion plant would encompass the four main processing buildings and the adjacent support buildings and structures that date primarily to the 1950s and 1960s (Figure 44). The C-410 Complex is located in a central position among the main processing buildings. The Complex served as a feed plant for the cascade diffusion system. Within the Complex, workers converted a powder form of uranium into a gas, which the cascade diffusion process requires. The work that took place within the C-410 Complex was a necessary step in the enrichment of uranium, which was the plant's primary function throughout the Cold War era. As a support facility, the C-410 Complex aided in the plant's overall mission. Other than its original expansions completed in the 1950s, the Complex has not been significantly altered. In the opinion of the Consultant, the C-410 Complex retains sufficient historical and architectural significance to be considered a contributing element to the district. As an ancillary facility, the Complex played a supporting role to the plant's historic operations and it would add to the district's overall sense of time and place.

A recent environmental study concluded that the C-410 Complex has a high contamination level of radioactive material and the facility poses a potential health risk to workers and the general public. Practically all parts of the facility are contaminated, and adaptive reuse of the buildings and structures of the C-410 Complex is not feasible. The DOE proposes the decontamination and decommissioning of the complex as soon as possible to diminish health risks to PGDP workers and the surrounding public.

VI. SUMMARY

The DOE proposes the decontamination and decommissioning of the C-410 Complex of the Paducah Gaseous Diffusion Plant near Paducah, in McCracken County, Kentucky. USEC operates PGDP for the DOE. The facility was established in 1952 as a uranium enrichment plant for the production of nuclear weapons. It is located approximately 12 miles west of Paducah and contains 161 buildings. The C-410 Complex served as a feed plant to the cascade diffusion system of the main processing buildings and is located in the central portion of the PGDP. The complex contains one main building with various expansions and associated support facilities. Operations within the complex ceased in 1994, and the facility is currently in a decommission and decontamination mode.

The purpose of this study is to evaluate the C-410 Complex of the PGDP for eligibility on the National Register of Historic Places and to comply with provisions of a draft Programmatic Agreement among the Department of Energy, the Kentucky State Historic Preservation Officer, and the Advisory Council on Historic Preservation that concerns the management of historical properties at the PGDP.

In the opinion of the Consultant, the PGDP contains a potential National Register Historic District that reflects the plant's Cold War significance and impact on local economic development. The main components of this district would be the primary processing buildings that contain the plant's historic cascade process. The C-410 Complex would be considered a contributing element to the district. A 1994 environmental study of the C-410 Complex revealed that the complex poses a potential health risk to site workers and the general public. Future adaptive reuse of the building is unfeasible due to risk of exposure to uranium contamination. Demolition of the C-410 Complex is considered necessary by the Department of Energy for the health and safety of PGDP workers and the surrounding public.

VII. BIBLIOGRAPHY

Allardice, C. and E.R. Trapnell. *The Atomic Energy Commission.* New York: Praeger Publishers, 1974.

"Atomic Plant to be Located At KOW Site Here," *The Paducah Sun-Democrat*, 15 December 1950.

"A Fantastic Power User," *The Paducah Sun-Democrat*, 17 April 1953.

Garrison, Joe. Section 106 Coordinator, Tennessee Historical Commission. Personal Interview, January 15, 2003.

Gosling, F. G. "The Manhattan Project, Making the Atomic Bomb" United States Department of Energy, Energy History Series, September 1994.

_______. Telephone Interview, January 14, 2003.

"The Growing Pains and Successes of a Real Boomtown," *The Paducah Sun*, 19 October 2002.

Hewlett, R.G. and O.E. Anderson. *The New World, 1939/1946: Volume I, A History of the United States Atomic Energy Commission*. University Park, PA: Pennsylvania State University, 1962

Logan, Jonathan. "The Critical Mass," *American Scientist* (May-June 1996).

"Paducah Changes Its Way of Life." *Life* Vol. 33, No. 2 (July 14, 1952), 21-24.

Programmatic Agreement Among the Department of Energy Paducah Site Office, The Kentucky State Historic Preservation Officer, and The Advisory Council on Historic Preservation Concerning Management of Historical Properties at the Paducah Gaseous Diffusion Plant (Draft). November 2002. Copy on file at the Department of Energy, Oak Ridge Operations, Paducah Site Office, Paducah, KY.

Rhodes, Richard. Dark Sun, *The Making of the Hydrogen Bomb*. New York: Simon and Schuster, 1995.

Robertson, John E.L. *Paducah, 1830-1980, A Sesquicentennial History*. Paducah, KY: Image Graphics, 1980.

Robinson, G.O. *The Oak Ridge Story*. Kingsport, TN: Southern Publishers, 1950.

Snyder, David. Section 106 Coordinator, Ohio Historic Preservation Office, Telephone Interview, January 13, 2003.

United States Department of Energy. "Level III Baseline Risk Evaluation for the C-410 Complex at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky." September 1994.

________. "Engineering Evaluation/Cost Analysis for the C-410 Complex Infrastructure at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky," October 2001.

United States Enrichment Corporation (USEC) website: www.usec.com.

"Welcome to the Atomic City," Paducah Gaseous Diffusion Plant promotional brochure, 2002.

APPENDIX A

RESUME OF PRINCIPAL INVESTIGATORS

PHILIP J.M. THOMASON
PRINCIPAL/THOMASON AND ASSOCIATES

EXPERIENCE

1982 - 2002 Historic Preservation Consultant - Thomason and Associates, Nashville, Tennessee

Military Installation Cultural Resource Consultant

Responsible for the analysis and evaluation of cultural resources at fifteen military bases. Evaluation includes the preparation of preservation plans, National Register nominations, and Programmatic Agreements. Consulting services provided to the US Navy at Memphis NAS and Corpus Christi NAS; US Air Force at Randolph AFB, Scott AFB, and Warner Robins AFB; and US Army at Fort Benning and Fort McPherson.

Tax Certification Consultant

Provided assistance, research and consultation necessary for projects utilizing the 20% Investment Tax Credit. This included involvement in the certification of fifty historic projects in Alabama, Kentucky, Tennessee, South Carolina and North Carolina.

Historic Preservation Plans, Ordinances and Design Review Guidelines

Authored plans, ordinances and design review guidelines for fifty communities throughout the country.

National Register Nominations

Author of National Register Nominations including Multiple Resource Area nominations for Hardin, Hopkins, and Pulaski Counties, Kentucky; Eastside MRA, Covington, Kentucky; Williamson County, Tennessee; Gaffney, South Carolina; Grenada Mississippi; and Oak Ridge, Tennessee. Over forty district and individual nominations have also been prepared resulting in over 10,000 structures placed on the National Register.

Cultural Resource Surveys

Directed surveys of historic structures in the Southeast and Midwest in districts, cities and counties. Areas surveyed include Hopkins County, Kentucky; Bardstown, Kentucky; Grenada, Mississippi; Grundy County, Tennessee; Bonne Terre, Missouri; and Mount Pleasant, South Carolina. Properties surveyed total over 20,000 structures.

Historic Structure Reports

Authored or co-authored historic structure reports recommending proper restoration techniques. Properties include the Benham Theatre, Benham, Kentucky; Christian County Courthouse, Hopkinsville, Kentucky; Sapphire Inn, Sapphire Valley, North Carolina.

Historic Survey Publications

Responsible for writing, research and layout for historic survey publications. These include survey publications for Hardin and Pulaski Counties, Kentucky; McCormick, Greenville and Spartanburg, South Carolina.

Section 106 Review and Mitigation

Conducted research and report writing for Section 106 mitigation including the Burkville Plantation Historic District, Lowdes County, Alabama, for the U.S. Army Corps of Engineers; Kentucky River Survey and Analysis for the Tennessee Valley Authority; Memphis I-40/240 Interchange and Route 840 for the Tennessee Department of Transportation.

1980-1982, Preservation Planner - Building Conservation Technology, Inc., Nashville, Tennessee.

Projects included:

Historian, Columbia Reservoir Historic Resources Survey
Author, Murfreesboro, Tennessee--Plan for Revitalization
Historian/Principle Author, Rugby Master Plan for the U.S. Army Corps of Engineers.

MEMBERSHIP

Board of Directors, Preservation Action, 1991-2002
Board of Directors, Tennessee Heritage Alliance, 1983-1993.
Board of Directors, Historic Nashville, Inc. 1982-1987/1992-1993.
National Trust for Historic Preservation

EDUCATION

Bachelor of Arts - Knox College, Galesburg, Illinois, 1975
Master of Arts - History, Emphasis on Historic Preservation, Middle Tennessee State University, 1981

AWARDS

First Award - Urban Planning and Design for contributions to the Rugby Master Plan. Awarded by Progressive Architecture, 1986.
Certificate of Merit - Historic Nashville Inc., 1986.
Certificate of Merit - Tennessee Historical Commission, 1988, 1990.

TERESA BIDDLE DOUGLASS
PRESERVATION PLANNER/THOMASON AND ASSOCIATES

EXPERIENCE

1998 - 2002 Preservation Planner - Thomason and Associates, Nashville, Tennessee

Historical and Architectural Surveys/Reports

Assisted in research, historic structure surveys, and preparation of reports for numerous projects for the Tennessee Department of Transportation. Areas surveyed include properties in Giles, Hardeman, Lawrence, Madison, Wayne, and Wilson Counties, Tennessee. Conducted historical and architectural surveys in Cape Girardeau, Missouri and Franklin, Tennessee.

Cultural Resource Surveys/Reports

Conducted research, survey, and analysis of the National Register-Listed Natchez Trace in Tennessee, located in Davidson, Hickman, Lawrence, Lewis, Maury, Wayne, and Williamson Counties, Tennessee. Also co-authored accompanying Cultural Resource Report for the Tennessee Department of Transportation. Provided assistance in survey, research, and writing for Cultural Resource and Landscape Study of Wills Valley in DeKalb County, Alabama.

National Register Nominations

Author of National Register Nominations for the Civil War site Roper's Knob, and the Adams Street Historic District, Franklin, Tennessee. Co-author of multi-property listing and historic district nominations for Cape Girardeau, Missouri.

Historic Preservation Plans

Assisted in the preparation of historic preservation plans for the City of Cape Giradeau, Missouri and design review guidelines for Biloxi, Mississippi.

1997-1998 Programs Assistant, American Association for State and Local History, Nashville, Tennessee

Professional Development Workshops

Assisted Director of Programs with coordination of professional development workshops, organization of curriculum materials, and correspondence with local faculty.

Newsletter Editing

Worked as editorial assistant on organization's monthly newsletter. Edited and entered information submitted by various organizations for publication, and authored short articles.

National Awards Program

Coordinated nationwide Awards Program Committee and review of award nominations.

1997 Historic Preservation Graduate Assistant, Center for Historic Preservation, Middle Tennessee State University, Murfreesboro, Tennessee

Historical and Architectural Surveys/National Register Nominations

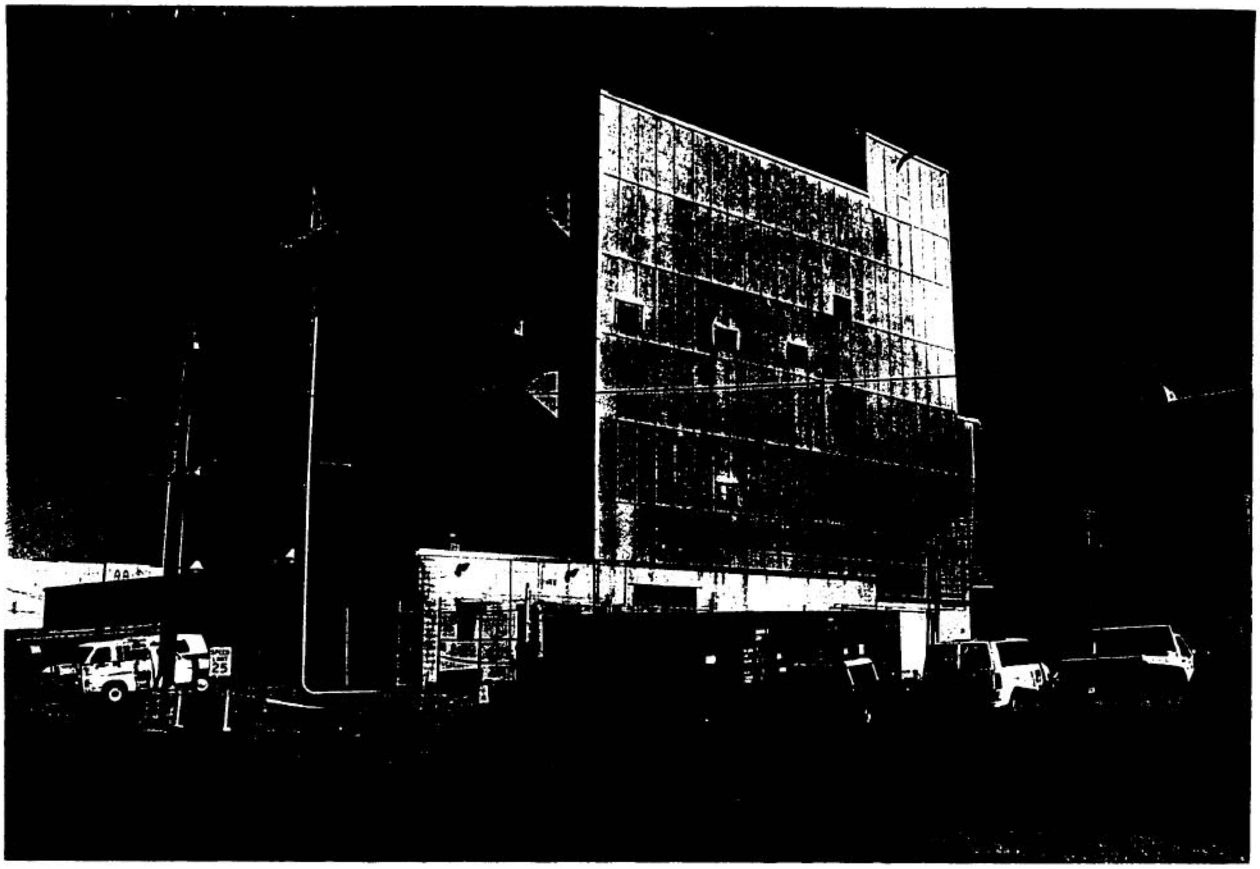
Conducted research and architectural surveys of historic rural African American churches for the Tennessee Rural African American Church Project. Surveys were conducted throughout the state of Tennessee. Authored National Register nominations for individual churches.

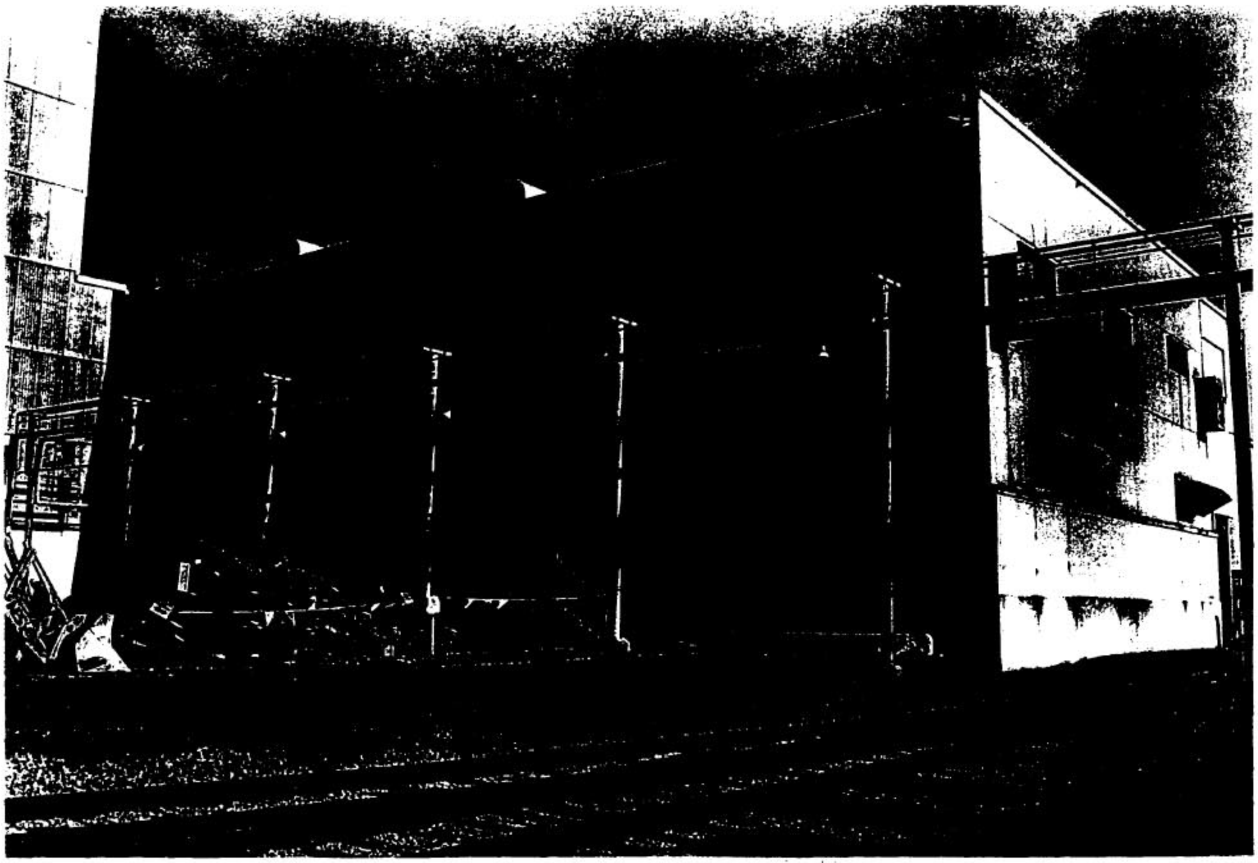
MEMBERSHIP

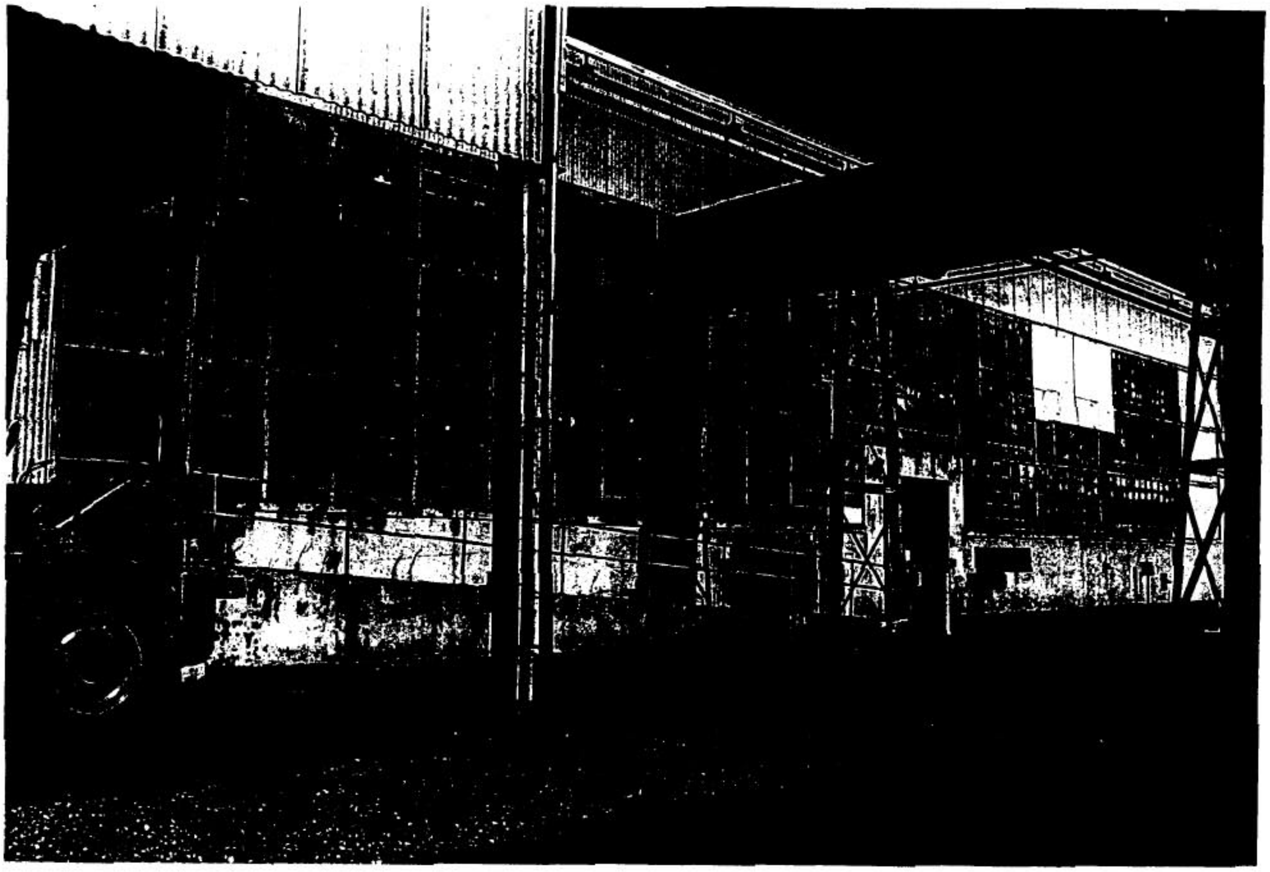
American Association for State and Local History
National Trust for Historic Preservation
Tennessee Preservation Trust - Treasurer

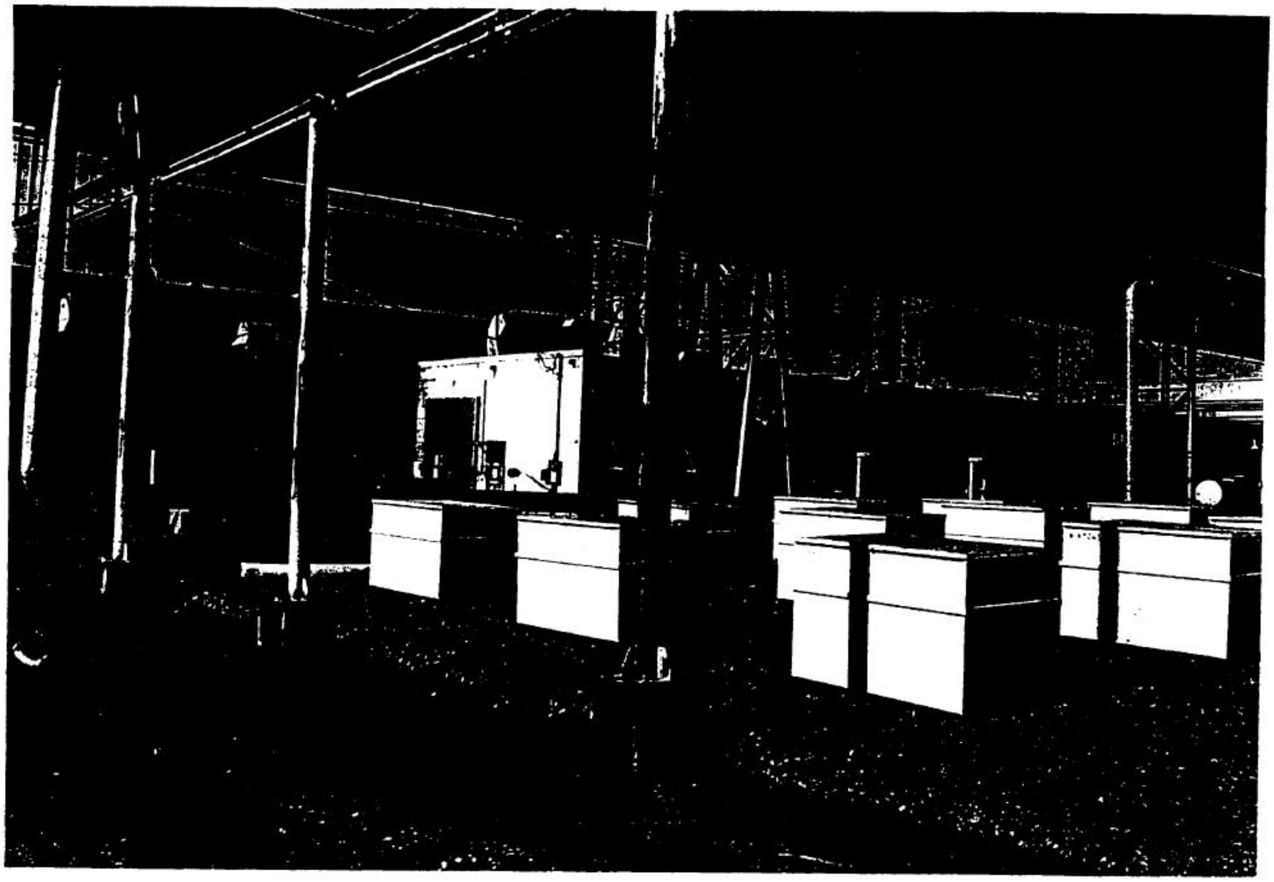
EDUCATION

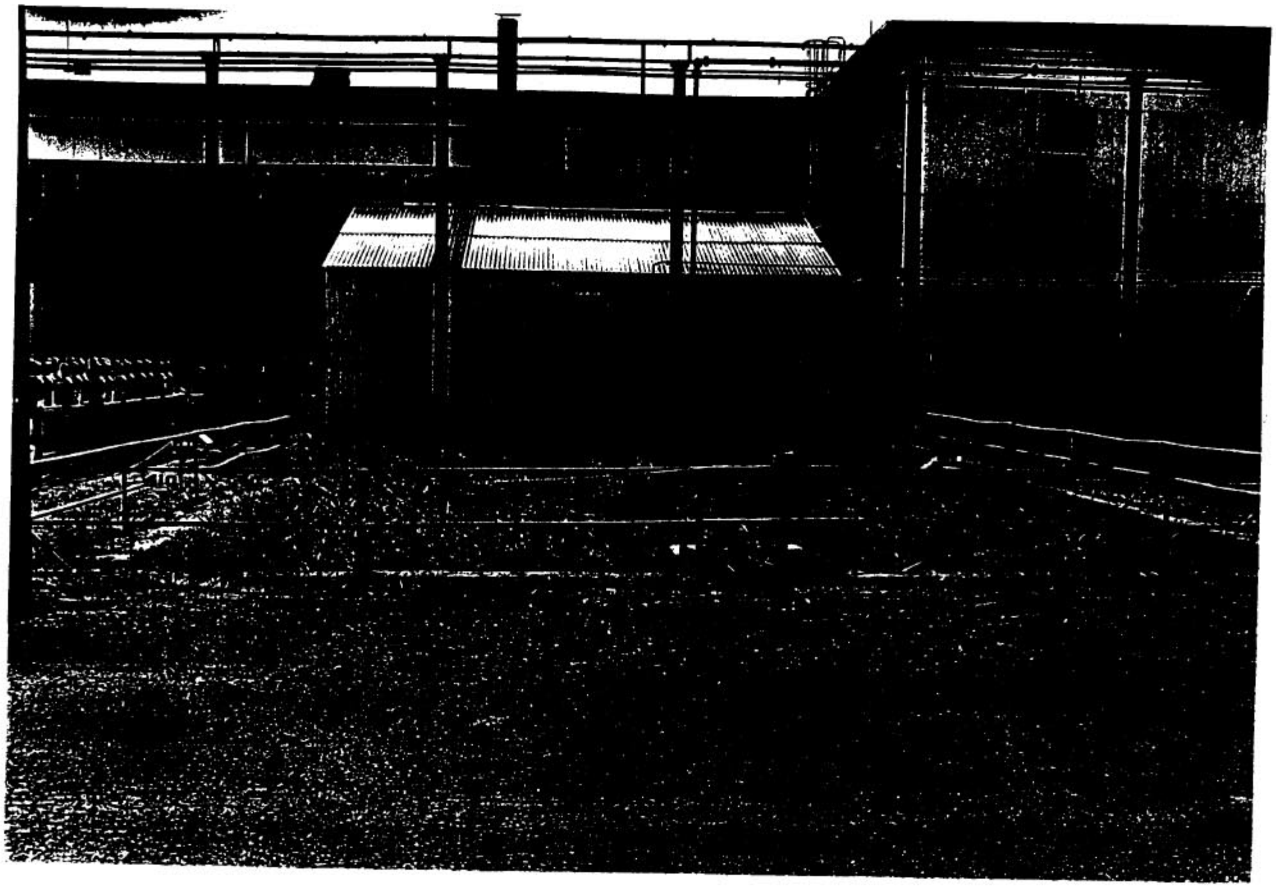
Bachelor of Arts - English and History, Middle Tennessee State University, Murfreesboro, Tennessee, 1993
Master of Arts - History, Emphasis on Historic Preservation, Middle Tennessee State University, Murfreesboro, Tennessee, 1998

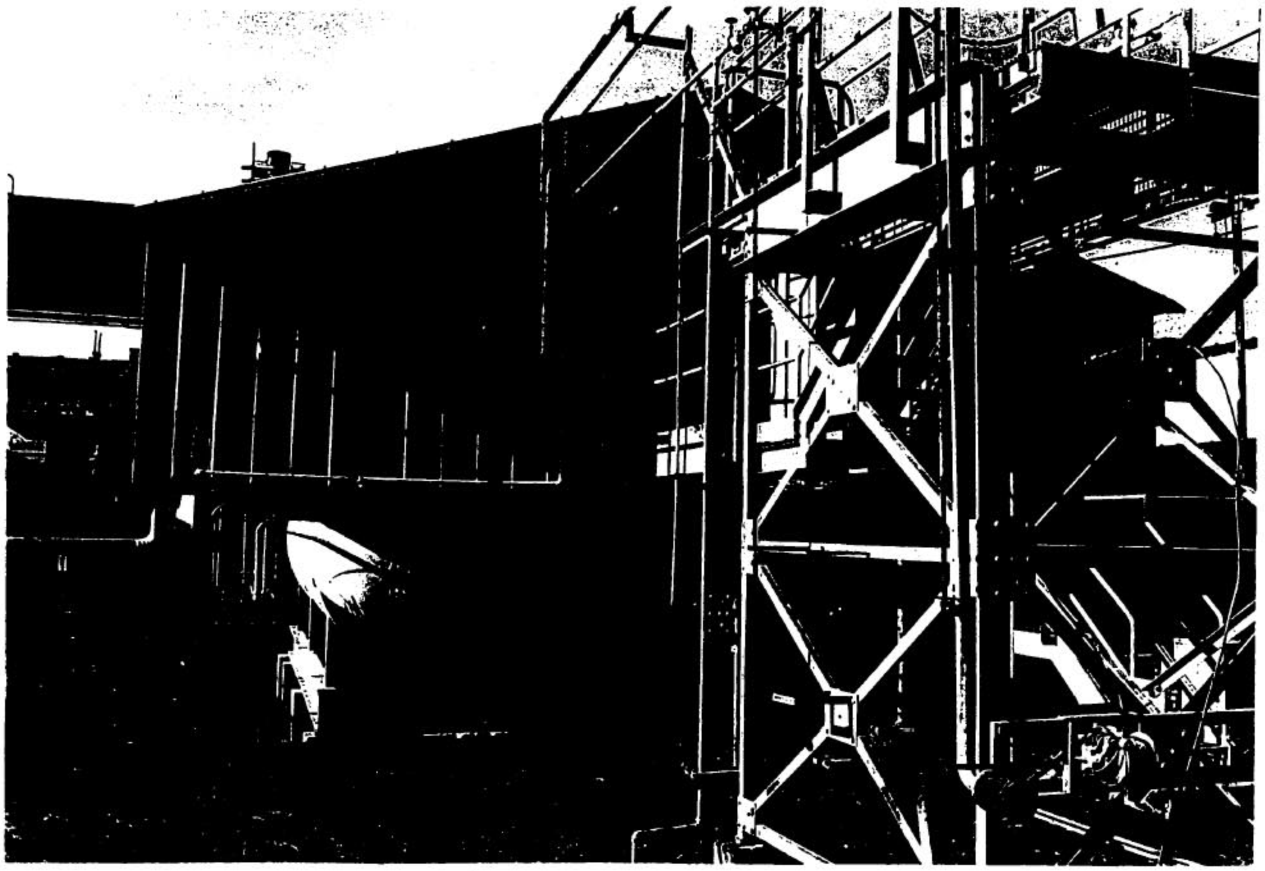


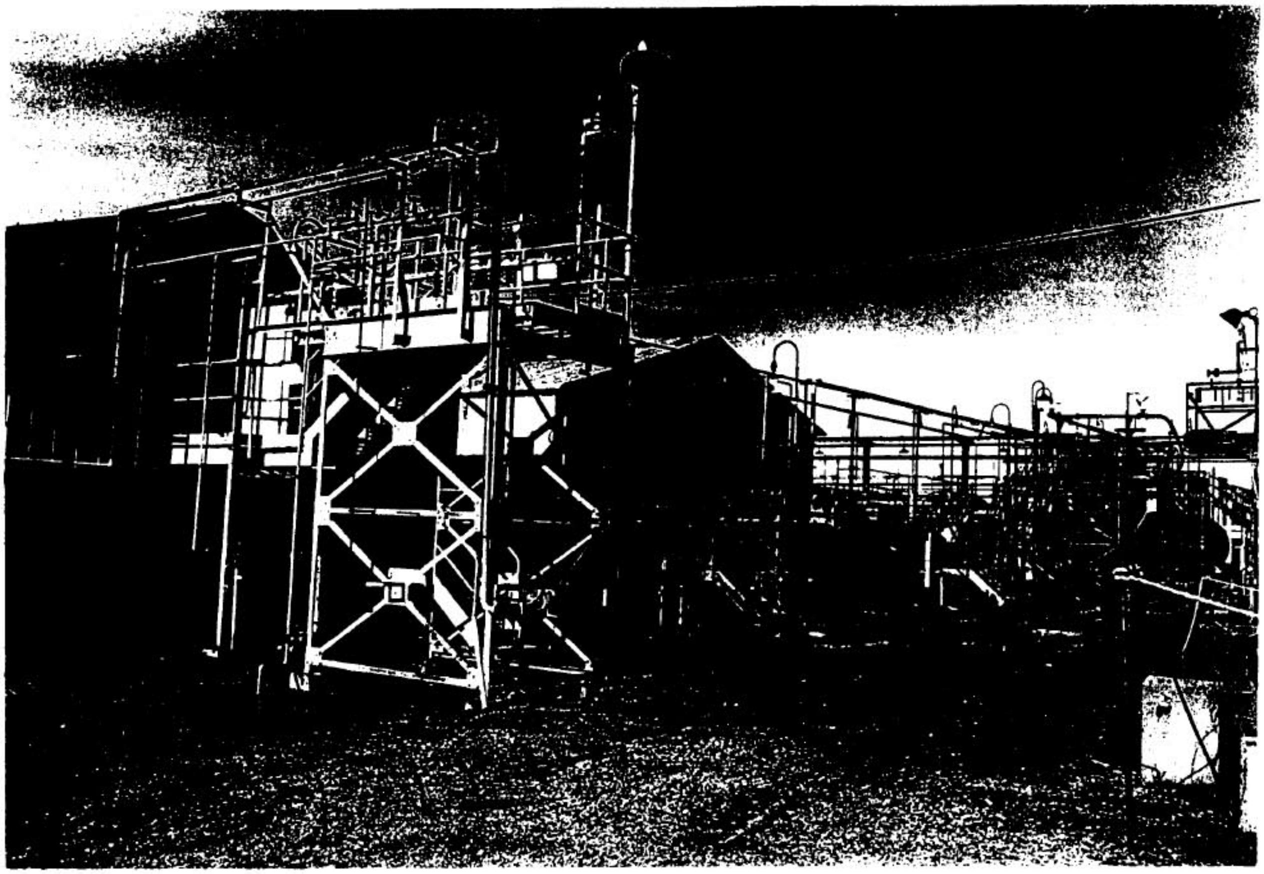




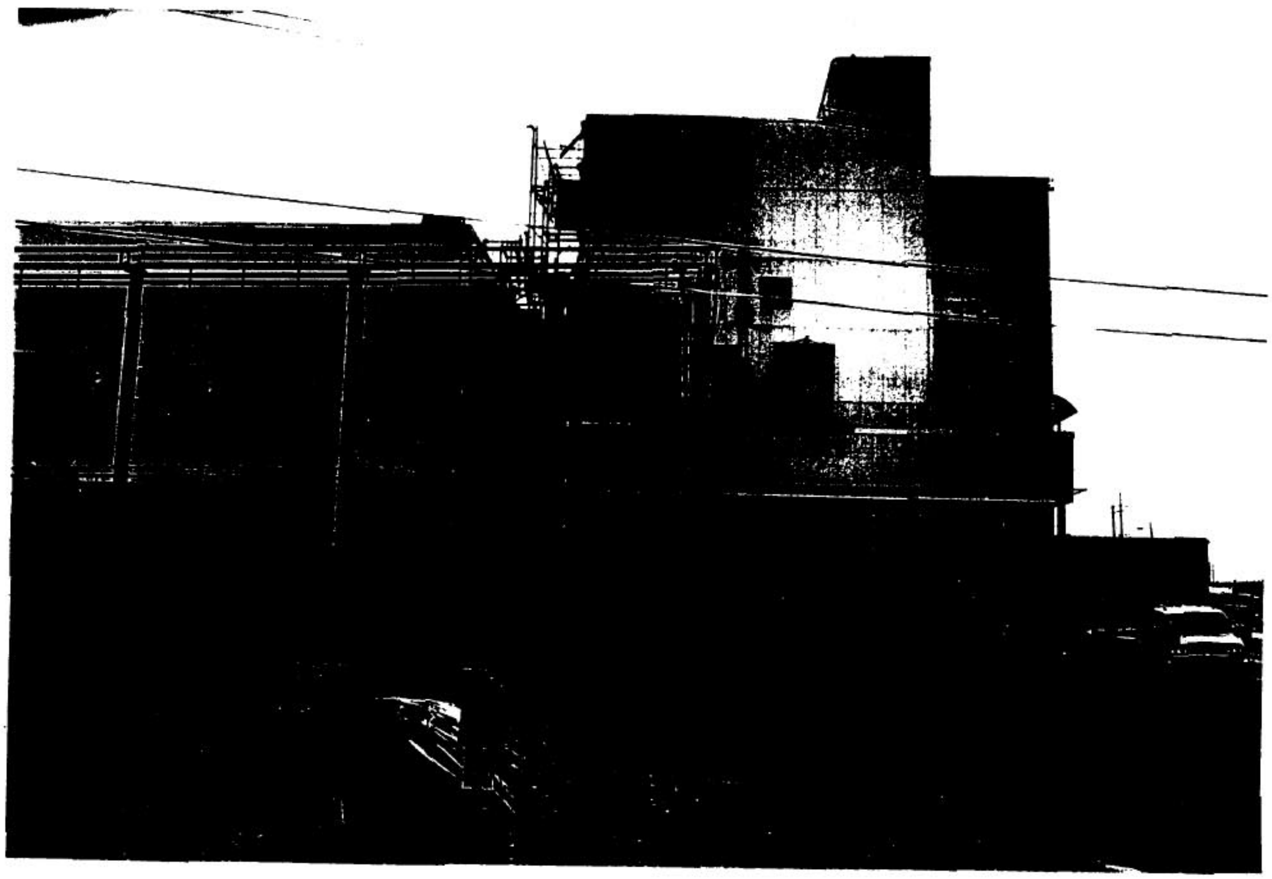









C-411
NOTICE
CAUTION
SAFETY GLASSES
REQUIRED
IN THIS AREA



APPENDIX B

KHC SURVEY FORM FOR THE C-410 COMPLEX

KENTUCKY HISTORIC RESOURCES
GROUP SURVEY FORM
(KHC 91-2)

COUNTY McCracken
GROUP # MCN-01
RELATED GROUP # ____
INTENSIVE DOC. ____/____
EVALUATION ____/____
DESTROYED ____/____

For instructions, see the Kentucky Historic Resources Survey Manual.

1. NAME OF GROUP (how determined): 7 /
C-410 Complex

2. ADDRESS/LOCATION: Located on the corner of Tennessee & 11th Street inside the Paducah Gaseous Diffusion Plant in Western KY, 3.5 S of Ohio River & 12 mi W of Paducah.

3. UTM REFERENCE:
Quad. Name: Heath, KY
Date: 1978 Zone: 16
Easting: 3 / 3 / 9 / 2 / 9 / 5 /
Northing: 4 / 1 / 0 / 9 / 0 / 6 / 5
Accuracy: ____/

4. OWNER/ADDRESS (Complex Only): Department of Energy c/o Brad Montgomery Bechtel Jacobs Co. 761 Veterans Ave Kevil, KY 42053

5. FIELD RECORDER/AFFILIATION:
Phil Thomason
Thomason and Associates

6. DATE RECORDED: January, 2003

7. SPONSOR: USEC, Inc.

8. INITIATION: 3 /

9. OTHER DOCUMENTATION/RECOGNITION:
____ Survey ____ HABS/HAER
____ KY Land ____ Local Land
____ NR ____ R & C
____ NHL
Other:

10. GROUP TYPE:
0 / 9 / Gaseous Diffusion Plant historic
1 / 3 / Not in use current

11. APPROXIMATE SIZE: 01 / less than 5 acres

12. LAYOUT: 02 / Grid

13. DATE RANGE:
02 / 1950-1974
____/
____/

14. PREDOMINANT PLANS:
____/ N/A
____/
____/

15. PREDOMININANT STYLES:
____/ N/A
____/

16. PREDOMINANT FUNCTIONS:
10-B / Extractive facility or site
____/

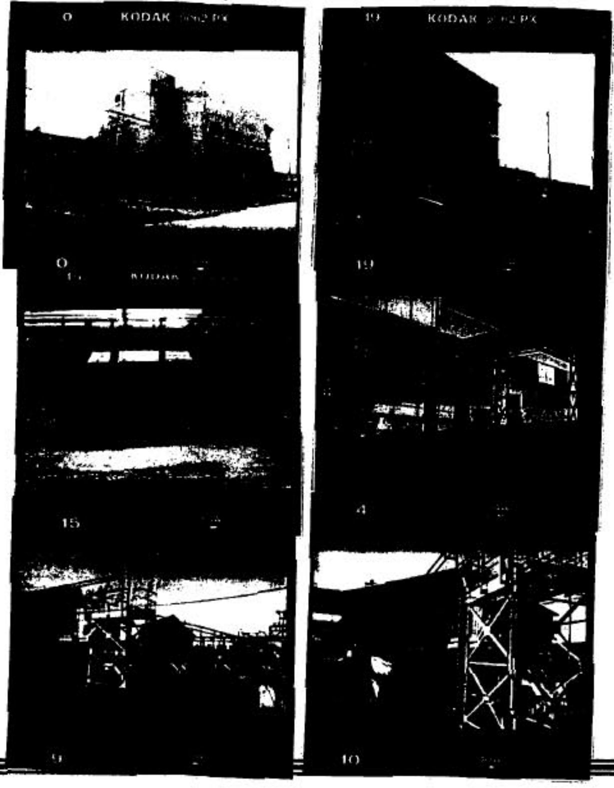
17. PREDOMINANT CONSTRUCTION METHODS/MATERIALS:
XX / Steel framing
P1 / Concrete block

18. CONTRIBUTING FEATURES:
____/ N/A
____/
____/

19. ASSOCIATED INDIVUAL RESOURCES.

20. MAP.

21. NEGATIVE FILE #: ____/____/____
(Write group # on back of all prints.)



KENTUCKY HERITAGE COUNCIL*FRANKFORT, KY 40601* (502) 564-7005

COUNTY McCracken
RESOSURCE # ________
GROUP # MCN-01
______ IDENTIFICATION ______ INTENSIVE
CATEGORY #'s ________

KENTUCKY HISTORIC RESOURCES
CONTINUATION SHEET
(KHC 91-4)

****

19. Associated Individual Resources

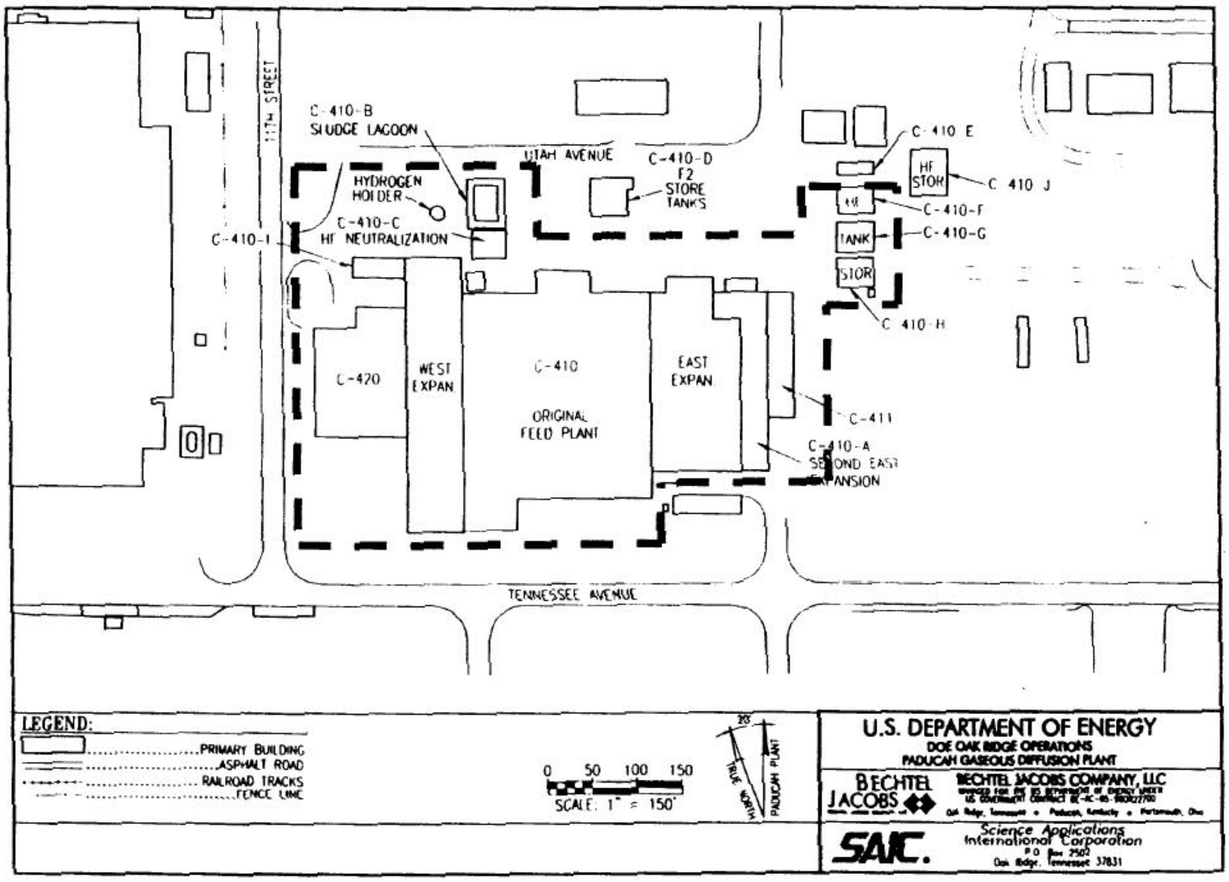
C-410B	Neutralization Sludge Lagoon
C-410C	HF Neutralization Plant
C-410F	HF Tank Storage
C-410G	HF Tank Storage
C-410H	HF Tank Storage
No Number	Hydrogen Holder

COUNTY McCracken
RESOSURCE # ________
GROUP # MCN-01
______ IDENTIFICATION ______ INTENSIVE
CATEGORY #'s ________
PAGE 3 OF 3 PAGES

KENTUCKY HISTORIC RESOURCES
CONTINUATION SHEET
(KHC 91-4)

****

20. Map



KENTUCKY HISTORIC RESOURCES
INDIVIDUAL SURVEY FORM
(KHC 2002-1)

For instruction, see the Kentucky Historic Resources Survey Manual.

COUNTY McCracken
RESOURCE # MCN-81
RELATED GROUP # MCN-01
EVALUATION ______
SHPO EVALUATION ______
DESTROYED ______

1. NAME OF RESOURCE (how determined): 7/
C-410 Building

2. ADDRESS/LOCATION: Located on the corner of Tennessee Street & 11th Street inside the Paducah Gaseous Diffusion Plant in Western KY - 3.5 miles South of the Ohio River and 12 miles West of Paducah, KY.

3. UTM REFERENCE:
Quad. Name: Heath, KY
Date: 1978 / Zone: 16 / Accuracy: ______
Easting: 3 / 3 / 9 / 2 / 9 / 5 /
Northing: 4 / 1 / 0 / 9 / 0 / 6 / 5 /

4. OWNER/ADDRESS: Department of Energy
c/o Brad Montgomery - Bechtel Jacobs
761 Veterans Avenue
Kevil, KY 42053

5. FIELD RECORDER/AFFILIATION: Phil Thomason
Thomason and Associates

6. DATE RECORDED: January, 2003

7. SPONSOR: USEC, Inc.

8. INITIATION: 3 /

9. OTHER DOCUMENTATION/RECOGNITION:
____ Survey ____ HABS/HAER
____ KY Land ____ Local Land
____ NR ____ NHL
Other:
Report Reference

10. ORIGINAL PRIMARY FUNCTION: 1 / 0 / B /

11. CURRENT PRIMARY FUNCTION: 9 / 9 / V /

12. CONSTRUCTION DATE: 2 / 1953-57 estimated
__/__/__/__/ ______ documented

13. DATE OF MAJOR MODIFICATIONS:
__/______
__/______

14. CONSTRUCTION METHOD/MATERIAL:
XX / P1 / Steel framing - concrete blk. original
XX / P1 / Steel Framing - concrete blk. subsequent

15. DIMENSIONS:
Height 73' (Tallest portion) Width 675' Depth 450'

16. PLAN: N/A
__/______ first
__/______ second
__/______ third

17. STYLISTIC INFLUNCE: N/A
__/______; __/______ first
__/______; __/______ second
__/______; __/______ third

18. STYLE DEVELOPMENT: N/A
____/ first ____/ second ____/ third

19. FOUNDATION:
TYPE: 2 / Continuous — MATERIAL: R / Poured Concrete original
__/______ — __/______ replacement

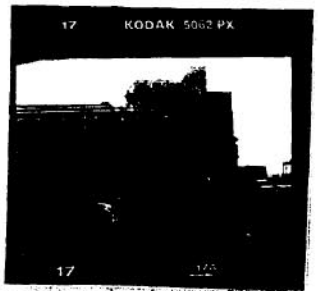
20. PRIMARY WALL MATERIAL:
O / Q Concrete block & Transite original
__/______ replacement

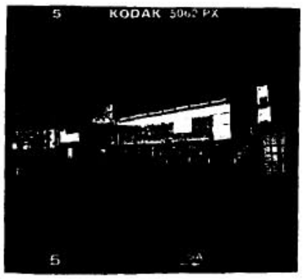
21. ROOF CONFIGURATION/COVERING:
CONFIGURATION: Q / flat — COVERING: O6 / gravel/tar original
__/______ — __/______ replacement

22. CONDITION: F /

23. MODIFICATION: 1 /

24. NEGATIVE FILE #: ____/____/______
Write resource # on back of all prints.





COMMENTS/HISTORICAL INFORMATION:

25. SUPPORT RESOURCES: **SITE PLAN KEY** **FUNCTION** **CONSTRUCTION DATE** **METHODMATERIAL**

N/A

* **26. SITE PLAN** (Complete if #25 was answered).

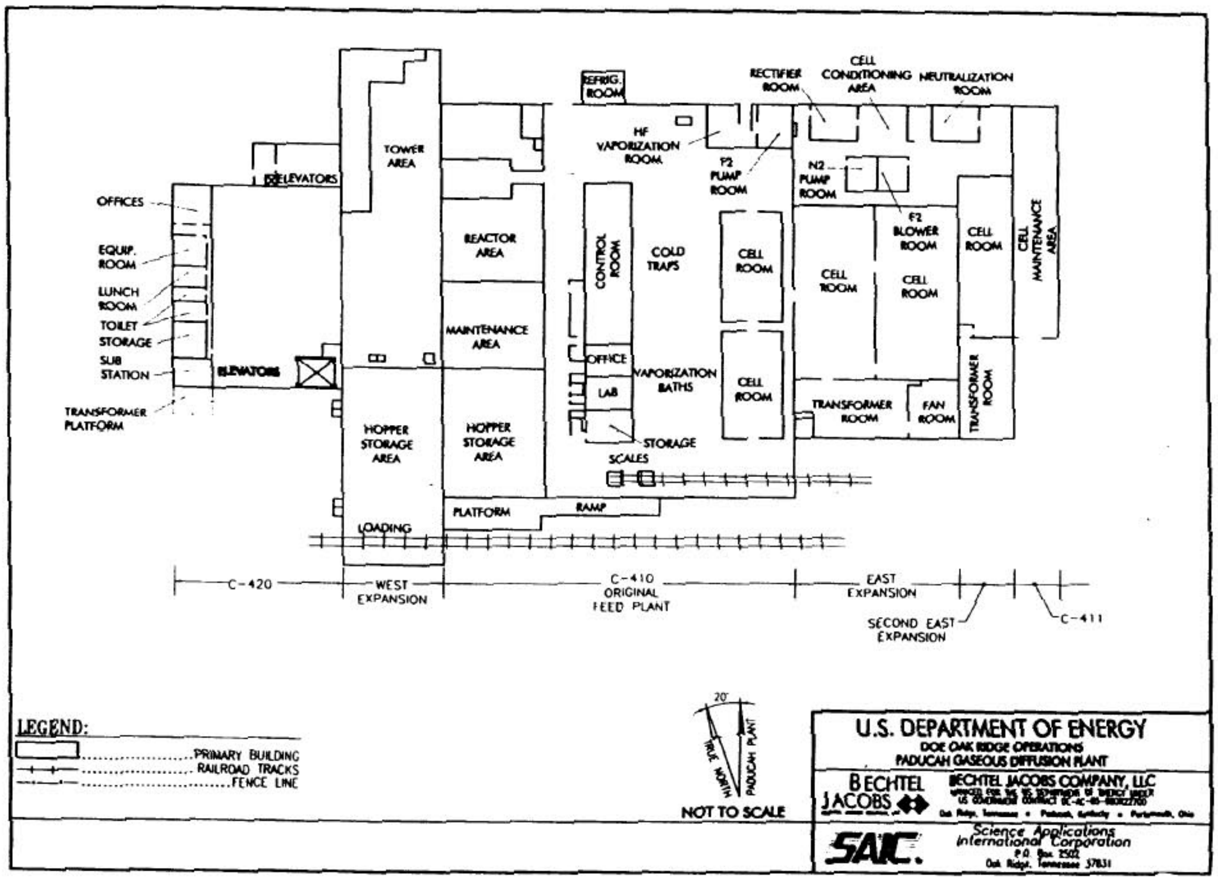
* **27. MAP** (Scan or attach copy of map showing exact location of resource)

COUNTY McCracken
RESOSURCE # MCN-81
GROUP # MCN-01
_____ IDENTIFICATION _____ INTENSIVE
CATEGORY #'s ________
PAGE 3 OF 5 PAGES

KENTUCKY HISTORIC RESOURCES
CONTINUATION SHEET
(KHC 91-4)

****

26. Site Plan:

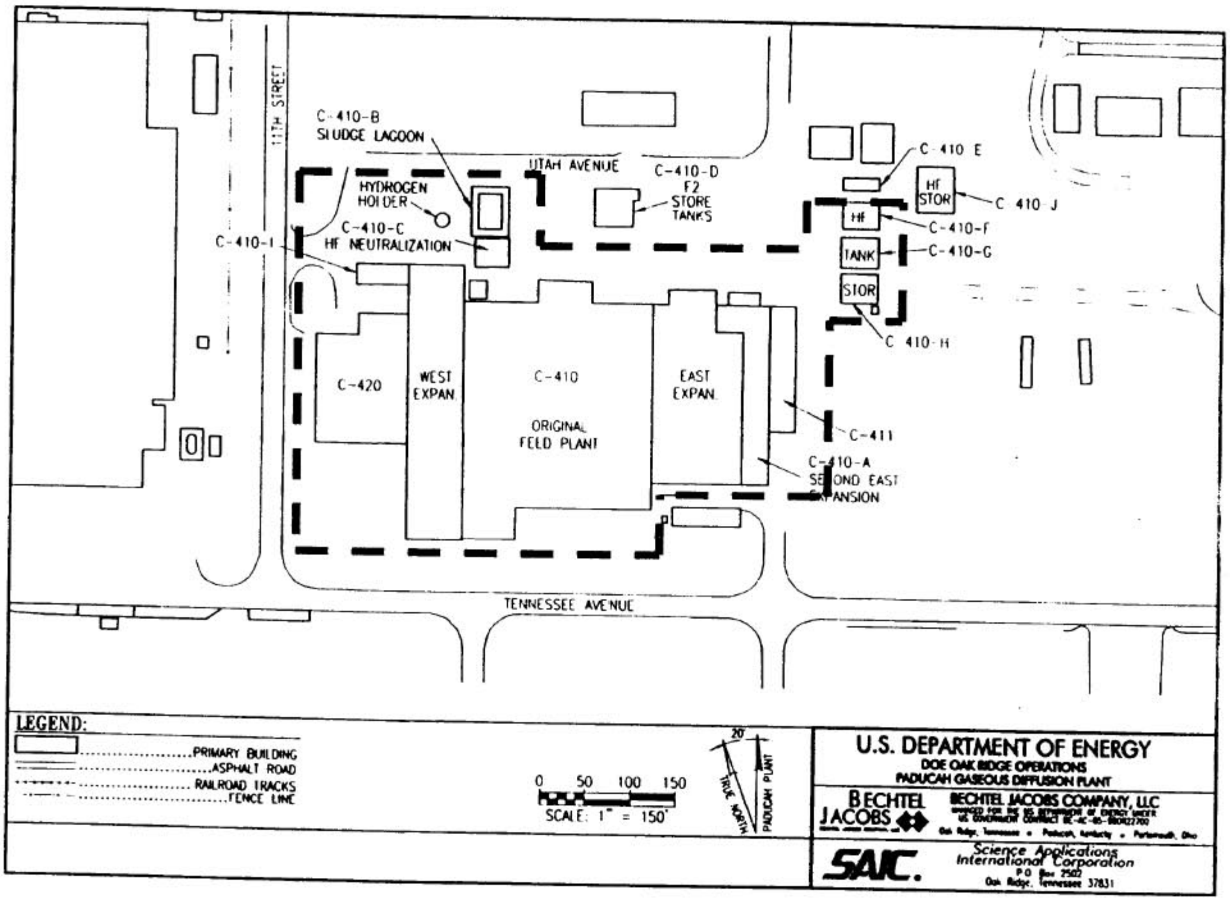


COUNTY McCracken
RESOSURCE # MCN-81
GROUP # MCN-01
______ IDENTIFICATION ______ INTENSIVE
CATEGORY #'s ________

KENTUCKY HISTORIC RESOURCES
CONTINUATION SHEET
(KHC 91-4)

****

27. Map (continued):

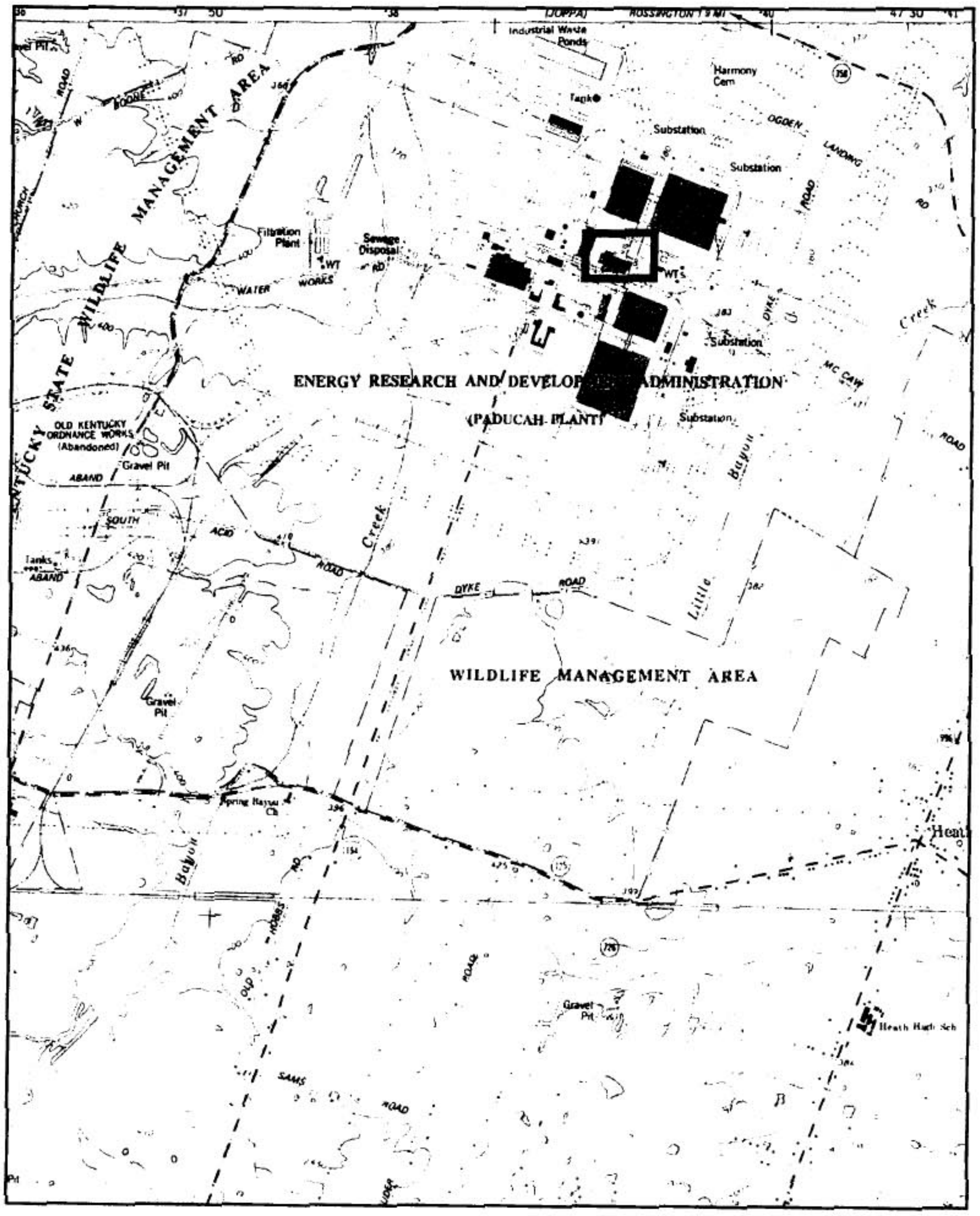


COUNTY McCracken
RESOSOURCE # MCN-81
GROUP # MCN-01
_____ IDENTIFICATION _____ INTENSIVE
CATEGORY #'s ________
PAGE 5 OF 5 PAGES

KENTUCKY HISTORIC RESOURCES
CONTINUATION SHEET
(KHC 91-4)

****

27. Map



USGS Quadrangle-Heath, Kentucky-7.5 min.

MARGARET "PEGGY" NICKELL
PRESERVATION PLANNER/THOMASON AND ASSOCIATES

EXPERIENCE

2001-2002 Preservation Planner – Thomason and Associates, Nashville, Tennessee

Historical and Architectural Surveys/Reports

Assisted in research, historic structure surveys, and preparations of reports for numerous road projects for the Tennessee Department of Transportation. Areas surveyed included properties in Shelby, Tipton, Lauderdale, Dyer, Fentress, Knox, Robertson, Rutherford, and Williamson counties in Tennessee.

Cultural Resource Surveys/Reports

Conducted research, historic structures surveys, and preparations of reports and designed layouts for projects in Oldham, Scott, Spencer, Owen, Lincoln, Bullitt, and Jessamine counties in Kentucky and Van Buren and White in Tennessee. Assisted with layout, graphics and preparation of report for a project in St. Augustine, Florida and for the Tapoco Hydroelectric Project.

National Register Nominations

Assisted in preparation of National Register nomination for the Bristol Commercial National Register District in Sullivan County, Tennessee and Washington County, Virginia. Assisted with research and historic structures and historic landscapes survey for the Trail of Tears Multiple Property Nomination for areas in North Carolina, Tennessee and Alabama.

Historic Preservation Plans

Assisted in the preparation, designed layout and graphics and brochure for the design review guidelines for Seneca, South Carolina. Assisted in the preparation and designed layout and graphics for the Davis Bridge Battlefield Preservation Plan.

2000-2001 Historic Preservation Graduate Research Assistant, Center for Historic Preservation, Middle Tennessee State University, Murfreesboro, Tennessee

National Register Nominations

Assisted in the preparation, research and extensive fieldwork for the Alexandria City Cemeteries National Register District in Alexandria, Tennessee. Conducted research and submitted a supplemental to the National Register nomination for Reed's Bridge, McLemore's Cove, and the railroad tunnel at the TN Valley Railroad Museum at Missionary Ridge in Chattanooga, Tennessee.

Cultural Resource Projects

Created a database for the Alexandria City Cemetery to be used for genealogy research in Dekalb County, Tennessee. Conducted an ongoing 19th Century Gristmills in Tennessee survey for the National Heritage Area Civil War in Tennessee. Participated in various other projects for the National Heritage Area Civil War in Tennessee program

Assisted students from Middle Tennessee State University with research projects.

1999-2000 Graduate Teaching Assistant, History Department, Middle Tennessee State University, Murfreesboro, Tennessee.

Teaching Assistance

Provided teaching assistance for two semesters of history courses-one was The Old South, taught by Dr. Robert Hunt and the other was American History 201 with Dr. Fred Rolater. Duties included attendance, grading, all student contact and office hours for tutoring. Also included with Dr. Hunt's class was the scheduling and arrangement of an off-campus fieldtrip to the Chickamauga/Chattanooga Battlefield in Chattanooga, Tennessee for approximately 25 students.

1998-1999 Undergraduate Research Assistant, Dr. Douglas Heffington, Geography Department, Middle Tennessee State University, Murfreesboro, Tennessee

Newsletter

Worked as assistant editor and graphics editor for *The Storyteller* – a newsletter for the Council of Interpretation of Native Peoples- Dr. Douglas Heffington- Editor.

Special Academic Projects in Geography

Graphics assistant for presentations at American Association of Geographers 94th Annual Meeting in Boston, Massachusetts by student geography presenters,

Cartographer (ArcView) for DeeGee Lester's Master's Thesis: The Public Presentation of Theodore Roosevelt at American Historical Sites and Museums, 1919-1998.

Special guest presentations and college lectures created and presented numerously on the Geography of Australia, New Zealand, Oceania, Hawaii, and Coral Reef Protection.

Research assistant for NASA/JOVE grant to examine land-use change among the Bribri Indians of the Costa Rica/Panama Border.

Provided administrative and organizational assistance for two summer institutes and workshops sponsored by Middle Tennessee State University, National Geographic Society, SEDDAG, and the Tennessee Geographic Alliance.- *Geography of Appalachia and From Stone Chips to Poker Chips: Cherokee Cultural Landscapes, and The Delta, Blues Highway, Cotton, and Casinos.*

Graphics assistance and editing on numerous publications, presentations, and projects by Dr. Douglas Heffington.

Secretary of the Tennessee Geographic Alliance – 1998.

MEMBERSHIP

Tennessee Preservation Trust 2000-2002
Association of American Geographers 1998

EDUCATION

Bachelor of Arts - History-major: Geography-minor, cum laude, Middle Tennessee State University, Murfreesboro, Tennessee, 1999.

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