

MALLINCKRODT CHEMICAL WORKS, Building No. 51A
(~~Mallinckrodt Inc.~~)
Bounded by Lane F, 7th Alley,
Buildings 52A, 52, and 51
St. Louis, Missouri

HABS No. MO-1929-C

HABS
MO
96-SALU,
134C-

PHOTOGRAPHS

WRITTEN HISTORICAL AND DESCRIPTIVE DATA

Historic American Buildings Survey
National Park Service
Great Plains Support Office
1709 Jackson Street
Omaha, Nebraska 68102-2571

HISTORIC AMERICAN BUILDINGS SURVEY
MALLINCKRODT CHEMICAL WORKS, BUILDING 51A
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- Location:** Bounded by Lane F, 7th Alley, Buildings 52A, 52, and 51, Mallinckrodt and Second streets, St. Louis, Missouri
- USGS Granite City, Illinois-Missouri Quadrangle (7.5'), Universal Transverse Mercator Coordinates: 744298 E; 4282781 N
- Present Owner:** Mallinckrodt Inc.
- Original Use:** Foundry, Buck's Stove and Range Company
- Present Use:** Demolished September 1996
- Significance:** One of 16 buildings at Mallinckrodt Chemical Works associated with the Manhattan Engineer District/Atomic Energy Commission (MED/AEC)—sponsored program to process uranium for use in the development of atomic weapons, Building 51A was used to reduce uranyl nitrate hexahydrate (UNH) to orange oxide through denitration, as part of the process to purify uranium.

PART I. HISTORICAL INFORMATION

A. Physical History

1. **Date of erection:** Building 51A was built between 1935 and 1941.
2. **Architect:** The architect for this building is unknown.
3. **Original and subsequent owners:** The original owner of the site where Building 51A is located was the Buck's Stove and Range Company, founded before 1883 in the North Broadway industrial section along the Mississippi River. The site of Building 51A was a foundry for the stove company. The foundry was demolished and the property was bought by Mallinckrodt Chemical Works (MCW) in 1935.
4. **Builder-contractor:** The contractor is unknown.
5. **Original plans and construction:** It is unknown whether there are original plans extant.
6. **Alterations and additions:** There have been a number of alterations to Building 51A, including: on the east side second floor level the original windows have been infilled with corrugated fiberglass; on the north side the wall and windows have been infilled with corrugated fiberglass; a smaller window on the second floor level has been infilled with concrete blocks; a high loading door with a metal sill has been blocked in with concrete blocks.

B. Historical Context

The building 50 series (50, 51, 51A, 52, 52A), constructed between 1883 and 1941, consist of five interconnected industrial warehouse buildings. The area where Buildings 51 and 52 were located originally was the foundry for the Buck's Stove and Range Company. The Buck's Stove and Range Company, located in the block between Mallinckrodt, Destrehan, Second, and Main streets, was founded in 1846 by Charles H. Buck in partnership with Wiley S. Wright. The company manufactured gas stoves, heating stoves, coal and wood ranges, gray iron castings, and porcelain and enamel ware. It was incorporated in 1875, and maintained warehouses in Chicago, Los Angeles, and San Francisco.

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The company facilities consisted of several foundries, a casting house, enameling house, mounting, plating and polishing building, warehouses, offices, sample showrooms, a carpenter and pattern shop, pattern vault, tin shop, and boiler building. The majority of the buildings were brick with several wood or corrugated metal buildings as well.¹

In 1935, Mallinckrodt Chemical Works purchased the western half of the Buck's Stove Company (Block 1207). Building 51, of which 51A is a part, was constructed between 1935 and 1941. In April 1942, when MCW became involved in purifying large batches of uranium oxide for the U.S. government as part of the wartime effort to develop the atomic bomb, Buildings 50, 51, 51A, 52, and 52A were taken over as the production site for the purification of the uranium oxide. The purification process took place in five stages: conversion of the uranium oxide to uranyl nitrate (which Mallinckrodt had sold for years as an analytical reagent), purification of the uranyl nitrate by ether extraction, recovery of the uranyl nitrate from the ether, conversion of the uranyl nitrate to uranium trioxide, and, finally, the reduction of uranium trioxide to uranium dioxide.²

According to Henry Schroer, a welder working to excavate a new floor during the conversion of Buildings 51 and 52 to uranium processing, hundreds of Civil War cannonballs were found, that had been stockpiled at the Buck's Company foundry.³ These apparently had remained after the foundry was demolished.

The process in Building 51A reduced the uranyl nitrate hexahydrate (UNH) produced in Building 52 to orange oxide through denitration. The UNH was put into covered stainless steel denitration pots, rounded on the bottom, that were heated by gas heaters underneath. Paddle scrapers at the bottoms of the pots stirred and ground the crystals until they became a powdery orange oxide (uranium trioxide). The orange oxide was scooped out of the pots by hand, placed in a collection hopper, and then a packaging hopper where it was loaded into containers to be taken to the dryer.

The orange oxide was then placed onto stainless steel trays and loaded on shelves within an enclosed dryer. Flammable hydrogen gas was piped inside the dryer, the oxygen was removed, and the resulting product was brown

¹ North St. Louis Businessmen's Association, *Who's Who in North St. Louis* (St. Louis: A.S. Werrenmyer, 1925), 303; *Whipple's Fire Insurance Map of St. Louis, Missouri* (St. Louis: A. Whipple, 1897), 136.

² The History Factory, *Mallinckrodt 125th Year Anniversary* (Washington, D.C., 1992), 57.

³ Jeanelle Hoffert, "These Things I Remember . . ." *Uranium Division News*, June 1962: 34.

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oxide (uranium dioxide). This brown oxide was then packaged and removed from Plant 2. At this stage it was either transferred to Plant 4 at MCW for further processing into green salt (UF₄) or sent off-site to a government facility for further processing. By July 1942, one ton per day of UO₂ was being produced in Building 51A. A total of approximately 4,400 tons of UO₂ were produced at Plant 2 from 1942 until its closure in 1946.⁴

PART II. ARCHITECTURAL INFORMATION

A. General Statement

1. **Architectural character:** Building 51A is an industrial brick building constructed as an infill between buildings 50, 52, and 52A. The building has been so altered that none of its architectural integrity remains.
2. **Condition of fabric:** The fabric is in poor condition.

B. Description of Exterior

1. **Overall Dimensions:** Building 51A is rectangular in shape, and measures 41'-10" in width x 57'-3" in length x 24' in height.
2. **Foundation:** The foundation is concrete.
3. **Walls:** The load-bearing brick walls are painted red.
4. **Structural system, framing:** Building 51A has load-bearing brick walls.
5. **Porches:** There are no porches or steps.
6. **Chimneys:** There are no chimneys.

⁴ Personal communication with Samuel M. Tuthill, Ph.D, Retired consultant, Technical Committees and Quality Standards, Mallinckrodt Inc. [December 12, 1996]; Charles D. Harrington and Archie E. Ruehle, *Uranium Production Technology* (New York: Van Nostrand Company, Inc., 1959), 182-83; Mont C. Mason, "History and Background Relative to the Radiological Re-Monitoring of Mallinckrodt by the Energy Research and Development Administration" (St. Louis: Mallinckrodt, Inc. 1977), 13.

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7. Openings:

- a. **Doorways and doors:** Building 51A has three exterior doors. On the north side is a loading dock door infilled with corrugated fiberglass. On the south side is an interior door opening to Building 52. On the east side are a metal double door with upper glass panes and a metal single door in a wood frame with an 8" wire glass pane.
- b. **Windows:** On the north side is one louvered vent at the second story level. Five large windows, two on the north and three on the east sides have been infilled with corrugated fiberglass.

8. Roof:

- a. **Shape, covering:** The flat roof is of red rolled asphalt. A brick parapet with a tile coping separates Building 51A from Building 52.
- b. **Cornice, eaves:** None
- c. **Dormers, cupolas, towers:** There are no dormers, cupolas or towers.

C. Description of Interior

1. **Floor plans:** There is one large room in Building 51A.
2. **Stairways:** There are no stairways.
3. **Flooring:** The building has concrete floors.
4. **Wall and ceiling finish:** The brick walls are painted. Some of the ground floor level walls have been covered with gunnite.
5. **Openings:** A door has been cut through at the southwest corner into Building 52. A second-story door into Building 52 has been bricked in at the south side. The openings between the piers on the west wall have been infilled with concrete block.

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6. **Decorative features and trim:** There are no decorative features and trim.
7. **Hardware:** There is no original hardware remaining
8. **Mechanical equipment:**
 - a. **Heating, air conditioning, ventilation:** The building was heated with steam from Building C in Plant 1.
 - b. **Lighting:** None of the original lighting remains.
 - c. **Plumbing:** There are no bathrooms. A sprinkler system is located on the ceiling.
9. **Furnishings:** None of the original furnishings remain.

D. Site

1. **General setting and orientation:** The 50 series buildings (50, 51, 51A, 52, 52A) are located in Plant 2, set within a number of new buildings on the north, south, and west sides. Oriented east/ west, the five buildings are connected and appear as a single unit.
2. **Historic landscape design:** The setting is industrial and there was no landscaping.

PART III. SOURCES OF INFORMATION

- A. Architectural Drawings:** Original drawings for this building were not located.

B. Bibliography

Harrington, Charles D., and Archie E. Ruehle. *Uranium Production Technology*. New York: D. Van Nostrand Company, Inc., 1959.

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PART IV. PROJECT INFORMATION

This HABS documentation project was undertaken as mitigative recordation required by Section 106 of the National Historic Preservation Act of 1966. The United States Department of Energy Former Sites Restoration Division demolished the Building 50 series in September 1996 as part of site remediation and decontamination.

The documentation was prepared by Alexandra C. Cole, architectural historian at Science Applications International Corporation (SAIC), Santa Barbara, California, in October 1996. Large-format photography was done by Bruce Harms of Louis Berger and Associates, Inc., Marion, Iowa, in August/September 1996. Measured floor plans and elevations were prepared under the supervision of Ohannes Armani of Bechtel National Incorporated (BNI), Oak Ridge, Tennessee, in September 1996.

*FOR SITE PLANS SEE MO-1929 FIELD NOTES