United States Department of the Interior
National Park Service

National Register of Historic Places Registration Form

This form is for use in nominating or requesting determinations for individual properties and districts. See instructions in National Register Bulletin, *How to Complete the National Register of Historic Places Registration Form.* If any item does not apply to the property being documented, enter "N/A" for "not applicable." For functions, architectural classification, materials, and areas of significance, enter only categories and subcategories from the instructions.

1. Name of Property

Historic name: American Viscose Plant Historic District
Other names/site number: VDHR# 128-0238
Name of related multiple property listing**:** N/A
(Enter a "N/A" if property is not part of a multiple property listing)

2. Location

Street & number: 9th Street SE, Industry Avenue SE, River Avenue SE, and Progress Drive SE

City or town: Roanoke State: VA County: Independent City

Not For Publication: N/A Vicinity: N/A

3. State/Federal Agency Certification

As the designated authority under the National Historic Preservation Act, as amended,

I hereby certify that this _X_ nomination ___ request for determination of eligibility meets the documentation standards for registering properties in the National Register of Historic Places and meets the procedural and professional requirements set forth in 36 CFR Part 60.

In my opinion, the property _X_ meets ___ does not meet the National Register Criteria. I recommend that this property be considered significant at the following level(s) of significance:

___national ___statewide _X_ local

Applicable National Register Criteria:

_X_ A ___B _X_ C ___D

Signature of certifying official/Title: **Date**

Virginia Department of Historic Resources

State or Federal agency/bureau or Tribal Government

In my opinion, the property ___ meets ___ does not meet the National Register criteria.

Signature of commenting official: **Date**

Title : **State or Federal agency/bureau or Tribal Government**

4. National Park Service Certification

I hereby certify that this property is:

___ entered in the National Register

___ determined eligible for the National Register

___ determined not eligible for the National Register

___ removed from the National Register

other (explain:) _____

_____

Signature of the Keeper Date of Action

5. Classification

Ownership of Property

(Check as many boxes as apply.)

Private:	[X]
Public – Local	[ ]
Public – State	[ ]
Public – Federal	[ ]

Category of Property

(Check only **one** box.)

Building(s)	[ ]
District	[X]
Site	[ ]
Structure	[ ]
Object	[ ]

Number of Resources within Property

(Do not include previously listed resources in the count)

Contributing	Noncontributing	
16	1	buildings
2	0	sites
2	0	structures
0	0	objects
20	1	Total

Number of contributing resources previously listed in the National Register 0

6. Function or Use

Historic Functions

(Enter categories from instructions.)
INDUSTRY/PROCESSING/EXTRACTION: manufacturing facility
COMMERCE/TRADE: business, warehouse

Current Functions

(Enter categories from instructions.)
INDUSTRY/PROCESSING/EXTRACTION: manufacturing facility
COMMERCE/TRADE: business, specialty store
RECREATION AND CULTURE: sports facility
VACANT/NOT IN USE

7. Description

Architectural Classification

(Enter categories from instructions.)
LATE 19TH AND 20TH CENTURY AMERICAN MOVEMENTS: Commercial Style

Materials (enter categories from instructions.)
Principal exterior materials of the property: CONCRETE; BRICK; METAL; SYNTHETICS/ Rubber

Narrative Description

(Describe the historic and current physical appearance and condition of the property. Describe contributing and noncontributing resources if applicable. Begin with **a summary paragraph** that briefly describes the general characteristics of the property, such as its location, type, style, method of construction, setting, size, and significant features. Indicate whether the property has historic integrity.)

Summary Paragraph

Situated along the Roanoke River at the base of Mill Mountain, the American Viscose Plant occupies a large, relatively flat, rectangular site on 9th Street SE in Roanoke, Virginia. The approximately 65-acre site currently comprises five separate tax parcels in the southeastern section of Roanoke and is bounded by Industry Avenue SE to the north, Progress Drive SE to the east, River Avenue SE to the south and 9th Street SE to the west. Constructed between 1916 and 1955 by the American Viscose Corporation, this large rayon producing plant consists of three large processing plants, each containing two spinning units with various appendages for storage and support spaces added over the years. The offices, employee dining rooms, and dispensary as well as the finishing and distribution areas are located at the north end of the plant buildings. Two large, two-story power/boiler houses stand adjacent to the processing plants. Smaller ancillary buildings for storage, maintenance and water treatment are located to the south, between the main factory buildings and River Avenue. The buildings are primarily one- and two-stories and constructed of brick on a solid concrete foundation. With the design of these industrial buildings dictated by their function, detailing is limited to brick pilasters and corbelling articulating structural bays and segmental arches or soldier courses spanning window and door openings. The roofs are flat with saw tooth skylights and monitors providing natural light in addition to the industrial steel-sash and glass-block windows. The majority of the buildings date between 1916 and 1928 with additions and improvements made through the 1950s. The complex is surrounded by both light industrial operations and modest houses built during the first half of the twentieth century to provide housing for the many workers at the rayon plant and other nearby industries. The historic district contains a total of 21 resources, including 16 contributing buildings, two contributing sites, two contributing structures, and one non-contributing warehouse. This intact collection of industrial commercial-style buildings represents

the construction techniques and functional designs used for a large industrial plant in the first half of the twentieth century.

Narrative Description

Setting

The American Viscose Plant encompasses an approximately 65-acre rectangular site on the east side of 9th Street SE in Roanoke City. The land to the north of the relatively flat site slopes down so that the Morningside neighborhood is located above the plant. The district is bounded by 9th Street SE to the west, Industry Drive SE to the north, Progress Drive SE to the east, and River Avenue SE to the south. The Roanoke River runs along the southern edge of the district and Norfolk Southern (formerly Norfolk and Western Railroad) tracks are located to the north of the district with spurs extending into the plant complex. Historically, 9th Street SE curved along the north boundary of the district and therefore the plant was approached primarily from the north. Ninth Street was realigned ca. 1970 to run along the west side of the district. Thus, the site is currently approached from the west side.

Architectural Analysis

The industrial complex consists of three main processing plants comprised of two separate spinning units each. The first unit of the westernmost large processing building began construction in 1916 and opened by the summer of 1917. The local newspaper heralded the modern design, sizable windows, and refined ventilation system. The building was appended to the east by a second unit by 1919. At the same time as the construction of the first processing unit, a large boiler/power house, filtration plant (now demolished) and a large vent stack were constructed to the east of the processing building. Construction on the second large processing building took place from 1921-1923. This processing building was similar in design and size to the first plant and stood to the east of the boiler/power house. From 1923-1925, several one-story additions and a five-story office wing were constructed onto the north elevation of the first processing plant. These additions housed the shipping, coning and drying functions for the building. Between 1925 and 1928, the third large processing building was constructed to the east of the second plant building. In conjunction with the construction of this third plant, a second boiler/power house, vent stack and a second water filtration plant were built.

Smaller ancillary buildings were built to the south of the main processing plants to serve as storage, maintenance and water treatment facilities. Some of these smaller buildings were connected to the large plants by a "network of underground tunnels and ballroom-sized rooms…so that the company's fire department could reach fires from below."[1] The primary purpose of the two vent stacks was to provide ventilation to these underground tunnels and rooms.

As industrial buildings, the design of the buildings was dictated by their function. The buildings are primarily one, two, and three stories in height with the one exception of the five-story office wing at the north end of the first processing plant. As fireproof construction was important for a processing plant, all buildings are constructed of brick, primarily in a five- or six-course American bond, on a

concrete foundation. Some later additions, however, are constructed of concrete block. Detailing is limited to brick pilasters and corbelling articulating the structural bays and segmental arches or soldier brick courses spanning the window and door openings. The flat roofs feature large spans of saw tooth skylights or monitors to provide natural light. Industrial-sash and glass-block windows with concrete sills fenestrate the plant buildings while the ancillary buildings tend to have smaller, double-hung, wood sash windows with a variety of light configurations. Many of the windows have either been infilled or replaced over the years by the various tenants. The buildings feature both pedestrian and freight entrances with loading docks. One- and two-story brick hyphens also connected many of the plants and their appendages, reflecting their interdependent functions. The interiors of these buildings were historically large, open spaces with minimal partition walls separating functions within the building. As industrial buildings, the interiors were unfinished with exposed masonry walls, concrete floors, and exposed structural columns and roof framing.

Since the closing of the viscose plant in 1958, the Industrial Development & Investment Company (IDIC) has owned and operated the complex, renamed the Roanoke Industrial Center, as a light-industrial park. With a variety of tenants occupying the buildings as independent businesses and operations, minor alterations have been made over the years, including the infill of existing and addition of new window and door openings. Interior connections have also been infilled with CMU to create firewalls as the large buildings began to be subdivided. The expansive, saw tooth skylights have been covered or removed in some locations as they leak and cause a maintenance issue. With the exception of the boilers in the power house, the machinery and equipment have been removed. For the most part, the interiors of the industrial buildings remain intact as they continue to be used for storage and light manufacturing with only minor alterations such as reversible partition walls for offices and restrooms. The exception is three areas along the east side of Processing Plant #1, which have been fully remodeled as commercial office space.

The American Viscose Plant retains a relatively high level of integrity. The buildings remain intact with minimal alterations and are in relatively good condition overall. The most common alteration in the district is the infill or replacement of original windows and doors. Sixteen buildings, two sites, and two structures are contributing resources, while just one building is noncontributing. As a whole, the buildings that comprise the district retain their integrity of form, location, design, setting, materials, feeling, and association and continue to convey an understanding of the rayon-production process and the industrial development of Roanoke during the first half of the twentieth century.

INVENTORY

The following inventory lists the resources within the American Viscose Plant (Historic District). It is organized alphabetically by street name and then numerically by street number. Each entry provides the address, date of construction, architectural style, current building use, VDHR File number, and the contributing status within the district. Whether a building is considered contributing or non-contributing was determined based on its integrity as it supports the historic district's significance under Criterion A (Industry) and Criterion C (Architecture) during the Period of Significance (ca. 1916 - 1958). Minor alterations such as those described above are taken into

account but were found either to have minimal effect on most of the resources within the complex and/or to be easily reversible. A warehouse constructed in 1988 is the property's sole noncontributing resource, due to its construction date well past the end of the period of significance (ca. 1916-1958). Resources are keyed to the attached Sketch Map/Photo Key by their numerical street address.

1912 Ninth Street SE

Processing Plant #1 **128-0238-0012** *Other DHR Id#:*
Primary Resource: **Processing Plant (Building), Stories 1, Style: Commercial Style, Ca 1916**
Contributing *Total:* 1

This building was constructed in various building campaigns. The original section was constructed from 1916-1920 as the first building at the plant. The section comprises the large, one-story, rectangular, processing block in the middle of the plant, along with many of the one-, two- and three-story appendages on the east, south and west elevations and the five-story addition to the north, which is connected to the main block by two above-ground passageways. Two-story brick passages separate the rectangular block from the appendages on the east and west elevations. The remaining one- and two- story additions were constructed from 1922-1925 with the exception of a small locker room addition on the north elevation constructed in 1940. A small non-historic, one-story addition that is L-shaped in plan is on the west elevation, appending the one-story shipping addition. Several small, rectangular non-historic additions append the locker room and drying room on the north elevation. Overall, the building features a mixture of flat, saw tooth and pent roofs. Most of the flat and pent roofs are obscured from public view by brick parapets with terra cotta coping. Metal pipes extend from the roof of an appendage on the east elevation. All sections of factory #1 are of brick or reinforced concrete with brick curtain wall construction. The historic brick walls are laid in five-course common bond, six-course common bond or five-course variant Flemish bond. Some sections of the brick walls are painted. The five-story office building features concrete mushroom columns on the west elevation and reinforced concrete columns on the north, east and south elevations. The three-story shop building features reinforced concrete columns. Several of the additions feature brick pilasters with triangular concrete caps. The building stands on a concrete foundation. Industrial steel-sash windows with central hoppers are extant on various sections of the building. Until recently, the five-story office building featured glass block windows. Historic window openings feature concrete sills and concrete or soldier course brick lintels. Historic garage openings are capped by segmental arches. Historic braced double-leaf wood doors, a historic single-leaf, four-light-over-two-panel wood door, and a single-leaf wood panel door remain around the building. Non-historic modifications include the infilling of window, garage and pedestrian door openings with brick, CMU, wood panels, metal panels, and louvered metal vents. Historic windows and doors have also been replaced with non-historic, double-hung vinyl and aluminum windows; non-historic metal garage doors; non-historic flush, metal, single-leaf doors; and aluminum frame storefront doors and windows.

Processing Plant #2 **128-0238-0013** *Other DHR Id#:*
Primary Resource: **Processing Plant (Building), Stories 1, Style: Commercial Style, Ca 1921**
Contributing *Total:* 1

This building was constructed between 1921 and 1923. It comprises a large, one-story rectangular processing block, bordered by one- and two-story passageways on the north, east and west elevations. Small, one- and two- story appendages were constructed on the east, south and west elevations. A large rectangular office addition appends the north elevation. A one-story brick passageway connects processing plant #2 with processing plant #1. The passageway is accented by stepped brick pediments, terra cotta coping and a brick soldier course. Overall, the building features a mixture of flat, saw tooth and pent roofs. Most of the flat and pent roofs are obscured from public view by brick parapets with terra cotta or sheet metal coping. All historic sections of factory #2 are of brick construction. The brick walls are laid in six-course common bond. Sections of the brick walls on the east and west elevations are painted. Brick pilasters divide the brick office/dining room building into bays and corbelled brick accents the bays. The building stands on a poured concrete foundation. Industrial steel-sash windows with central hoppers and glazed block windows with visions panels are extant on various sections of the building. The windows are capped by a solider course of brick and have concrete sills. The only remaining historic doors are two pairs of double-leaf wood doors on the second-story of the south elevation. Non-historic modifications include the infill of historic garage, window and pedestrian door openings with plywood, T1-11, CMU, metal panels, brick, and replacement garage doors, windows and pedestrian doors. Some of the historic concrete sills have been removed. A non-historic entrance with a conical roof, glazed block windows and aluminum-frame doors appends the southwest corner of the office block. A non-historic garage addition on the east elevation is built of painted CMU and a non-historic one-story office addition sheathed with vertical boards is on the west elevation.

Processing Plant #3 **128-0238-0014** *Other DHR Id#:*
Primary Resource: **Processing Plant (Building), Stories 1, Style: Commercial Style, Ca 1925**
Contributing *Total:* 1

This building was constructed between 1925 and 1927. The building comprises a large, one-story rectangular processing block, bordered by one- and two-story passageways on the north, east and west elevations. Small, one- and two- story appendages were constructed on the east, south and west elevations. A large L-shaped block appends the north side of the original processing block. Historically, a one-story brick passageway connected processing plant #3 with processing plant #2; it has been partially demolished. Overall, the building features a mixture of flat, saw tooth, monitor and pent roofs. Most of the flat roofs are obscured from public view by brick parapets with terra cotta or sheet metal coping. The historic sections of processing plant #3 are of brick construction, with the exception of an appendage on the east elevation that is of reinforced concrete construction. The brick walls are laid in five- and six-course common bond. Portions of the brick walls on the east and west elevations are painted. Brick pilasters divide the north and west elevations of the north L-shaped block into bays. The brick pilasters on the west elevation feature triangular concrete caps. The building stands on a poured concrete foundation. Industrial steel-sash windows with central hoppers and glazed block windows are extant on various sections of the

building. The windows are capped by a solider course of brick and have concrete sills. The only remaining historic doors are double-leaf wood doors on the south elevation. Non-historic modifications include the infill of historic garage, window and pedestrian door openings with plywood, T1-11, CMU, metal panels, brick, louvered vents, and replacement garage doors, windows and pedestrian doors. Some of the concrete sills have been removed. A non-historic rusticated CMU addition appends the west elevation.

Pipe Shop **128-0238-0015** *Other DHR Id#:*
Primary Resource: **Processing Plant (Building), Stories 1, Style: Commercial Style, Ca 1928**
Contributing *Total:* 1

This one-story masonry building is rectangular in plan. A brick parapet with terra cotta coping obscures the flat roof. The brick walls are laid in six-course common bond. Brick pilasters divide the front (south) elevation into five bays and the side elevations into two bays. The industrial steel sash and steel casement windows have concrete sills and are capped by a course of soldier bricks. Two half-lite, single-leaf metal doors with metal overhangs are located on the façade. Contemporary metal roll-up garage doors are on the façade and east elevation. The historic garage opening on the façade is capped by a jack arch. The garage opening on the east side elevation is non-historic as it intersects a historic pilaster and the brick above the opening has been modified. Several of the historic window and garage openings have been infilled with CMU.

Power/Boiler House #1 **128-0238-0016** *Other DHR Id#:*
Primary Resource: **Boiler House (Building), Stories 2, Style: Commercial Style, Ca 1916**
Contributing *Total:* 1

The power/boiler house #1 comprises both one-story and two-story sections, arranged in a complex plan. The original block was constructed in 1916. In 1923, the building was appended to the south. The brick walls are laid in a six-course common bond. The building stands on a poured concrete foundation. The bays are divided by brick pilasters. The building features a mixture of flat and gable roofs, hidden by stepped and flat brick parapets with terra cotta coping. Monitor roofs cap the gable roofs of the central section. The window and garage door openings are capped by either concrete lintels or single courses of soldier bricks. Some of the windows retain their concrete sills. The remaining windows are steel sash with a central hopper. Many of the openings are infilled with corrugated metal, plywood or brick. The building is accessed by wood panel and metal garage doors as well as non-historic single-leaf doors. A round brick exhaust chimney is located directly south of the building. A concrete loading dock abuts the east side elevation.

Shop Building **128-0238-0017** *Other DHR Id#:*
Primary Resource: **Processing Plant (Building), Stories 1, Style: Commercial Style, Ca 1922**
Contributing *Total:* 1

This shop building is comprised of three, one-story sections arranged in a rectangular plan. The building stands on a poured concrete foundation. Constructed of fireproof masonry, the exterior

brick walls are laid in a six-course common bond. Brick pilasters divide the bays of the building. The saw tooth roof is partially obscured by brick parapets with terra cotta coping on the east and south elevations. The small entrance section at the southern end of the structure has a flat roof with terra cotta coping. The building features double-hung wood sash windows that are 6/6, industrial steel sash windows with a central hopper, and paired steel sash windows. The windows have concrete sills and are capped by either concrete lintels or brick soldier courses. Segmental-arched clerestory window openings with concrete sills on the east and west elevations have been infilled with vertical wood boards. On the east elevation, a garage opening, capped by a segmental arch, has been infilled with brick. Several of the window openings are covered with non-historic metal panels. A paneled wood garage door, accessed by a CMU loading dock with concrete steps, is on the east elevation. The west and north elevations feature modern metal garage doors and non-historic single-leaf doors. Many of the historic garage door openings, capped by segmental arches, have been modified with CMU, vertical wood board and brick infill. Two of the openings have arched, multi-light wood transoms.

Auto Repair Building **128-0238-0018** *Other DHR Id#:*
Primary Resource: **Processing Plant (Building), Stories 1, Style: Commercial Style, Ca 1928**
Contributing *Total:* 1

This one-story building is rectangular in plan with a non-historic garage addition that appends the east elevation. The flat roof features metal coping. The exterior walls are sheathed with brick laid in a stretcher bond. The north elevation features brick pilasters and decorative brick corbeling. The north elevation has double-hung wood sash windows that are 10/10 with brick rowlock sills, capped by a soldier course of brick. The north elevation features a mix of metal garage doors and double-leaf wood doors capped by brick soldier courses. A historic opening has been modified with brick infill and presently contains a flush metal single-leaf door with a metal overhang. The west elevation features two wood casement windows and a double-hung wood sash window that is 10/10. All window openings are capped by a course of soldier brick and have brick rowlock sills. A metal garage door is located in a historic opening, capped by a course of soldier brick. The south elevation has been extensively modified by a non-historic porch addition that is covered with metal as well as historic garage openings infilled with CMU or brick and metal garage doors and a flush metal single-leaf door. Two non-historic, divided-lite, wood storefront windows infill historic openings. All historic openings are capped by a course of soldier brick. The rear garage addition features two metal garage doors with vision panels, a garage opening that has been infilled with CMU and a flush metal single-leaf door.

Pulp Warehouse Building #1 **128-0238-0019** *Other DHR Id#:*
Primary Resource: **Warehouse (Building), Stories 1, Style: Commercial Style, Ca 1922**
Contributing *Total:* 1

This masonry building is comprised of one-story and two-story sections arranged in an irregular plan. The building features a mix of saw tooth, flat, gable and pent roofs. The brick walls are laid in six-course common bond. Brick pilasters divide the west façade into seven bays. Two industrial steel

sash windows with a central hopper have been retained. The arched clerestory window openings in the saw tooth roof are capped by segmental arches and have concrete sills. Historic window openings throughout the building are capped by brick soldier courses or segmental arches and some retain concrete sills. Historic garage and door openings are capped by segmental arches. Non-historic alterations to the building include the removal of sills and the infill of historic openings with metal panels, vertical wood boards, and brick. A non-historic addition appends the west elevation and is covered with corrugated metal. A non-historic exterior CMU chimney has been added to the west elevation. The building features a mix of metal single-leaf doors, metal garage doors, and a pair of contemporary, full-light, wood double-leaf doors that are sheltered by a metal garage door system. A metal awning protrudes from the south elevation.

Compressing/Mixing Building #1 128-0238-0020 *Other DHR Id#:*
Primary Resource: **Processing Plant (Building), Stories 2, Style: Commercial Style, Ca 1922**
Contributing *Total:* 1

This brick building is comprised of several one-story, two-story and three-story sections, arranged in a rectangular plan. The flat roofs are partially obscured by brick parapets with terra cotta coping. The brick walls are laid in six-course common bond. The remaining windows are industrial steel sash with central hoppers on concrete sills. All historic window openings are capped by a course of soldier brick. Historic arched double-leaf and single-leaf metal doors capped by segmental arches are located on the north elevation. A tall brick elevator enclosure is located on the west elevation. Historic window and door openings have been modified with vents and CMU infill. Two non-historic, metal sheds append the south elevation. A metal awning supported by wood posts protrudes from the east side elevation.

Soda Dilution Building 128-0238-0021 *Other DHR Id#:*
Primary Resource: **Processing Plant (Building), Stories 2, Style: Commercial Style, Ca 1922**
Contributing *Total:* 1

This brick building is comprised of one-story and two-story sections arranged in an L- shaped plan. The exterior walls are sheathed with brick laid in a six-course bond. Brick parapets with terra cotta coping obscure the flat roof. Chimney pipes extend above the roof. The fenestration is comprised of fixed, multi-light wood windows with concrete sills, capped by brick soldier courses. Non-historic alterations include the infill of historic openings with CMU, brick and metal panels, a concrete loading dock sheltered by a metal awning, and two-non-historic, one-story, brick additions. Metal garage doors and non-historic, single-leaf doors access the building.

Chemical Storage Building 128-0238-0022 *Other DHR Id#:*
Primary Resource: **Warehouse (Building), Stories 1, Style: Commercial Style, Ca 1928**
Contributing *Total:* 1

This one-story building stands on a concrete slab foundation and is rectangular in plan. The saw tooth roof is covered with a rubber membrane and corrugated metal panels. The exterior walls are

sheathed with brick laid in six-course common bond. Brick pilasters divide the bays. Clerestory window openings with rowlock brick lintels are capped by segmental arches. The west and east elevations feature rectangular projecting entrances with ¾-light wood single-leaf doors capped by segmental arches. Segmental arches also cap the historic garage door openings, which contain metal garage doors. On the west elevation are historic double-leaf wood doors accented with segmental arches. Non-historic modifications to the building include infilled clerestory windows, new openings on the north and east elevations, metal awnings, and a concrete porch with a metal roof. A concrete loading dock and a concrete ramp abut the east side elevation. Metal steps access the concrete loading dock while the concrete ramp accesses the non-historic garage opening. Non-historic metal stairs and a deck access the office door on the east elevation as well. A metal awning shelters the concrete loading dock. A non-historic, full-light aluminum frame door on the east elevation is sheltered by an aluminum frame awning.

Segregated Dining Room **128-0238-0008** *Other DHR Id#:*
Primary Resource: **Dining Hall/Cafeteria (Building), Stories 1, Style: Commercial Style, Ca 1928** **Contributing** *Total:* 1

This dining room was designated for use by African American employees during the Jim Crow segregation era. It is comprised of several one-story sections, arranged in a rectangular plan. The building features both flat and gable roofs. A brick parapet with terra cotta coping and a brick chimney remain around what is likely the original section of the building. The exterior walls are sheathed with brick laid in a stretcher bond. Brick pilasters demarcate the bays. The double-hung wood sash windows have 12/12, 9/9 or 6/6 configurations. The historic window openings are capped by a course of soldier bricks and supported by a course of rowlock bricks. Non-historic modifications include the infilling of historic openings with plywood or metal panels and a non-historic metal storage addition appending the north elevation. Metal garage doors, sliding plywood wood doors, and non-historic single-leaf doors access the building. The northeast section is covered with corrugated metal and contains industrial steel sash windows with central hoppers that are partially covered by wood panels.

Laboratory **128-0238-0023** *Other DHR Id#:*
Primary Resource: **Processing Plant (Building), Stories 1, Style: Commercial Style, Ca 1928**
Contributing *Total:* 1

This brick building is rectangular in plan. The building stands on a concrete slab foundation. The exterior brick walls are laid in a six-course common bond. Brick pilasters with concrete caps divide the bays of the building. The building features both saw tooth roofs and flat roofs with brick parapets and terra cotta coping. Historic window openings have concrete lintels and are capped by soldier course bricks. Most of the historic garage, single-leaf door and window openings have been infilled with T1-11, plywood, CMU and replacement windows and doors. On the west elevation, a paired double-hung wood 6/6 sash window remains intact.

Pulp Warehouse Building #2 **128-0238-0024** *Other DHR Id#:*
Primary Resource: **Warehouse (Building), Stories 1, Style: Commercial Style, Ca 1926**
Contributing *Total:* 1

This brick building is composed of several one-story and two-story sections, arranged in an irregular plan. The building features a mix of saw tooth and flat roofs. Brick parapets with terra cotta coping rise above the flat roofs on the east and south elevations. The brick walls are laid in six-course common bond. Brick pilasters divide the east, north, and west sides into bays. Historic window openings have concrete sills and brick soldier course or concrete lintels. Industrial steel sash windows with a central hopper have been retained on the north elevation and the east side of the two-story section at the south end of the building. A historic multi-lite, fixed, wood window is retained on the east elevation. The arched clerestory window openings in the saw tooth roof are capped by segmental arches and have concrete sills. Historic garage and pedestrian door openings are capped by segmental arches. Historic wood double-leaf and single-leaf doors remain on the north and south elevations. The remains of a historic metal lift are extant on the south elevation. Metal pipes protrude from the east elevation. A historic metal stair accesses the roof on the west elevation of the two-story section. Non-historic alterations to the building include the removal of pilasters and the infill of historic openings with brick, vertical wood boards, and non-historic siding. Non-historic windows and siding infill historic window openings on the south elevation. The building features a mix of non-historic single-leaf doors and metal garage doors. A concrete platform, which is sheltered by a metal roof, protrudes from the west elevation. A non-historic garage that stands on CMU piers stands to the west of the building. The front gable roof is sheathed with corrugated metal and the walls are covered with metal cladding. A wood panel garage door is on the south elevation.

Compressing/Mixing Building #2 **128-0238-0025** *Other DHR Id#:*
Primary Resource: **Processing Plant (Building), Stories 2, Style: Commercial Style, Ca 1926**
Contributing *Total:* 1

This brick building consists of several one-story, two-story and three-story sections, arranged in a rectangular plan. Historically, the one-story south block housed the compressors, while the two- and three-story north block housed the mixers. The flat roofs are partially obscured by brick parapets with terra cotta and metal coping. The brick walls of the north block are laid in six-course common bond, while the painted brick walls of the south block are laid in stretcher bond. A tall brick elevator enclosure is located on the west elevation. All historic window openings have concrete sills and are capped by a course of soldier brick. Industrial steel sash windows with central hoppers are extant on the north block. All historic door openings feature three course segmental arches. Historic double-leaf and single-leaf arched wood doors capped by segmental arches are located on the west elevation. A historic, arched single-leaf metal door is found on the east elevation. Historic window and door openings have been modified with CMU, corrugated infill, T1-11 and replacement doors. A metal fire escape projects from the east elevation. A one-story, non-historic addition sheathed in corrugated metal with a shed roof appends the historic south block.

Power/Boiler House #2 **128-0238-0026** *Other DHR Id#:*
Primary Resource: **Boiler House (Building), Stories 2, Style: Commercial Style, Ca 1927**
Contributing *Total:* 1

This power/boiler house has one-story, two-story and four-story sections. The original block is of fireproof masonry construction and was built ca. 1927. A ca. 1954-1955 steel-frame-constructed annex appends the south elevation. The building stands on a poured concrete foundation. The brick walls of the original block are laid in six-course common bond. The walls of the annex are sheathed in brick laid in stretcher bond. The north elevation features a large brick, segmental-arched opening with a keystone, flanked by large rectangular openings. The original block features brick corbeling at the roof line. Brick pilasters divide the original block into bays. A CMU addition with a metal roof vent projects from the east elevation. Brick parapets with terra cotta coping obscure the building's flat and gabled roofs. Round metal smokestacks rise above the roof. The building features industrial steel sash and glazed block windows with concrete sills. The industrial steel sash windows on the original block are capped by a course of soldier bricks. Many of the window panes are missing from both window types throughout the building. Pipes protrude from the building. A terra cotta silo stands on a steel platform and is connected to the boiler house annex by a metal catwalk. Non-historic metal panels cover window openings and sections of the brick walls. A non-historic one-story office addition sheathed with vertical wood boards and capped by an asphalt shingle hipped roof appends the east elevation. A CMU ash hopper stands to the east of the building.

Spring Pump House **128-0238-0009** *Other DHR Id#:*
Primary Resource: **Pump House (Structure), Stories , Style: Commercial Style, Ca 1928**
Contributing *Total:* 1

This one-story brick building is square in plan with a concrete slab foundation. The painted brick walls feature a concrete cap and are laid in a Flemish variant bond consisting of one Flemish course to every five stretcher courses. The front (west) elevation features a single-leaf, five-panel, wood door capped by a brick segmental arch with alternating solider and header bricks. Sidelights and a transom have been removed. A double-hung sash wood window with a concrete sill and lintel is found on the other three elevations. The window on the north side elevation has 6/12 lights, while the window on the rear (east) elevation is 12/12 and the window on the south side elevation is 6/6. Overgrown vegetation obscures much of the rear elevation. Metal pipes project from the north and south side elevations and extend to the ground.

Pump Station **128-0238-0010** *Other DHR Id#:*
Primary Resource: **Pump (Structure), Stories various, Style: Commercial Style, Ca 1928**
Contributing *Total:* 1

This structure historically was composed of several compartments; two reservoirs, a cooling tower, a pump tank, three filter houses, and two settling basins. The two reservoirs measured approximately 40 meters x 40 meters each with concrete foundations approximately 8 meters deep below ground surface. The two reservoirs were contiguous and divided by a cement wall with a metal bridge. Today, the reservoirs have been replaced with a gravel parking lot enclosed by chain-link fencing.

The cooling tower is elevated to ground level by four concrete rectangular supports. It has a concrete foundation, aluminum siding, and a steeply pitched gable roof. West of the cooling tower, a pump tank once was located. The small rectangular cement basin, situated approximately 8 meters below ground surface, is no longer extant. Two of three filter houses have been demolished but for portions of their east and south walls. The remaining filter house is a two-story building with a flat roof featuring terra cotta coping and double-hung wood sash windows. Above each window are brick segmental relieving arches. Two settling basins are surrounded by concrete walls approximately 10 meters above ground surface. The walls are mostly intact.

Ventilation Stack #1 **128-0238-0027** *Other DHR Id#:*
Primary Resource: **Chimney (Site), Stories , Style: No discernible style, Ca 1922**
Contributing *Total:* 1
Ventilation stack #1 is a tall brick stack that originally served processing plants #1 and #2. It is connected by underground tunnels to the factory buildings. The stack stands on an octagonal brick base that is laid in three-course common bond.

Ventilation Stack #2 **128-0238-0028** *Other DHR Id#:*
Primary Resource: **Chimney (Site), Stories , Style: No discernible style, Ca 1926**
Contributing *Total:* 1
Ventilation stack #2 is a tall brick stack that originally served processing plant #3. It is connected by underground tunnels to the factory building. The stack stands on an octagonal brick base that is laid in four-course common bond. A concrete ramp is located on the west side. On the east side is a segmental arch and a small opening capped by a jack arch.

Non-Historic Warehouse **128-0238-0029** *Other DHR Id#:*
Primary Resource: **Warehouse (Building), Stories 1, Style: No discernible style, Ca 1988**
Non-Contributing *Total:* 1
This one-story warehouse is rectangular in plan. The front-gable roof is covered with corrugated metal. The CMU walls are clad with corrugated metal on the east, west and south elevations. The north wall is painted CMU. The building stands on a concrete slab foundation. The building does not possess any windows. Vents are located on the east and west elevations. Single-leaf flush metal doors and metal roll-up garage doors provide access to the building.

8. Statement of Significance

Applicable National Register Criteria

(Mark "x" in one or more boxes for the criteria qualifying the property for National Register listing.)

[X] A. Property is associated with events that have made a significant contribution to the broad patterns of our history.

[ ] B. Property is associated with the lives of persons significant in our past.

[X] C. Property embodies the distinctive characteristics of a type, period, or method of construction or represents the work of a master, or possesses high artistic values, or represents a significant and distinguishable entity whose components lack individual distinction.

[ ] D. Property has yielded, or is likely to yield, information important in prehistory or history.

Criteria Considerations

(Mark “x” in all the boxes that apply.)

[ ] A. Owned by a religious institution or used for religious purposes

[ ] B. Removed from its original location

[ ] C. A birthplace or grave

[ ] D. A cemetery

[ ] E. A reconstructed building, object, or structure

[ ] F. A commemorative property

[ ] G. Less than 50 years old or achieving significance within the past 50 years

Areas of Significance
(Enter categories from instructions.)

ARCHITECTURE
INDUSTRY

Period of Significance

ca. 1916-1958

Significant Dates

1916-1919
1921-1923
1925-1928

Significant Person
(Complete only if Criterion B is marked above.)
N/A

Cultural Affiliation

N/A

Architect/Builder
Ballinger Company (architect)
J.P. Pettyjohn and Company (contractor)

Statement of Significance Summary Paragraph (Provide a summary paragraph that includes level of significance, applicable criteria, justification for the period of significance, and any applicable criteria considerations.)

The American Viscose Company opened the Roanoke plant in 1917 as its second plant to produce artificial silk in the United States. Located on 212 acres along the Roanoke River, the plant initially provided employment to more than 1,000 workers, many of whom were young, single women from the surrounding rural counties. The first plant doubled in size in 1919. With the construction of a second plant in 1921-1923, the Roanoke plant employed 3,800 workers (of whom 58 percent were women) and produced 12 to 13 million pounds of artificial silk—representing 35 percent of total US production. The fabric, later known as rayon, was used in the production of hosiery, clothing, upholstery, draperies, carpets and tires. Following the completion of a third processing plant in 1928, the Roanoke plant reached its peak of employment in 1928, with 5,500 workers, and was reported to be the largest manufacturer of rayon in the world. Many of the employees lived in either Hillcrest Hall, a now-demolished company dormitory for single women, or in the surrounding neighborhoods of southeast Roanoke that developed to provide workforce housing. The company provided onsite amenities—such as dining halls, a gymnasium, and a dispensary—and sponsored numerous social and recreational activities. Renamed the American Viscose Corporation in 1937, the company provided military supplies during World War II with the Roanoke plant producing fabric for parachutes, paratrooper suits, and machinery. Following the war, competition from more modernized plant operations as well as other artificial materials, such as nylon, eventually resulted in the decision to close the American Viscose Plant in Roanoke in 1958. The Industrial Development and Investment Company, a group of local investors, purchased the property in 1961 and they continue to operate it as an industrial park today. The American Viscose Plant Historic District in Roanoke is locally significant under Criterion A in the area of Industry as the second largest industrial enterprise in Roanoke and the largest employer of women in the area during the first half of the twentieth century, as well as the largest producer of rayon in the world in 1928. The historic district is also locally significant under Criterion C in the area of Architecture as the size, layout, design, and construction of the various buildings in this large industrial complex reflect the functional operations of a rayon-processing plant during the first half of the twentieth century. The period of significance begins in 1916, when construction began on the first plant, and continues to 1958 when the American Viscose Plant ceased operations.

Narrative Statement of Significance (Provide at least **one** paragraph for each area of significance)

CRITERION A: INDUSTRY

The American Viscose Plant in Roanoke is significant on the local level in the area of Industry as the second plant built in the United States by the American Viscose Company to produce artificial silk utilizing the viscose process. After opening the first processing plant in 1917, the Roanoke silk mill tripled in size by 1928 to become the largest of the company's four plants in the United States. The Roanoke plant was reported to be the largest textile mill in the southeast and the leading manufacturer of rayon in the world.[2] As such, the American Viscose Plant was the largest industry

established in Roanoke during the first half of the twentieth century and represented the city's second wave of industrial development following the establishment of the Norfolk & Western Railway Company in the late-nineteenth century. The production of 17 million pounds of rayon in 1927 represented approximately 27 percent of the sixty million in total value of industrial products manufactured in Roanoke for that year.[3]

Initially employing over 1,000 workers when the plant opened in 1917 and exceeding 5,000 workers at its peak in the late 1920s, the American Viscose Plant was second in Roanoke only to the Norfolk and Western Railway Company in the number of employees during the first half of the twentieth century.[4] The American Viscose Plant was unique as it provided employment opportunities for women. Many of these female employees were young, single women from the surrounding rural counties where such opportunities did not exist previously. The large workforce at the plant also prompted the further development of the surrounding residential neighborhoods of southeast Roanoke with many households including several members who worked at the Viscose plant. With a payroll that exceeded $5 million in 1940 and reached $7 million before the plant closed in 1958, the economic impact of the American Viscose Plant in Roanoke reached far beyond the value of the rayon it produced.[5]

As a leader in the rayon industry, the American Viscose Plant in Roanoke also reflects the evolution of the textile industry during the first half of the twentieth century. Following the resurgence of cotton mills in the South at the turn of the nineteenth century, the production of artificial silk by the American Viscose Company marked the introduction of manmade fabrics to the textile industry. Later named "rayon" in the 1930s to distinguish it from other synthetic fabrics such as nylon, the artificial silk material was not considered fully synthetic as it was manufactured from wood pulp and cotton fibers. During World War II, the production of rayon increased as the material was used to produce parachutes and paratrooper suits as well as protective coverings for military machinery and equipment. After the war, the textile industry in general suffered from tariffs and the rayon industry, in particular, began to be eclipsed by the synthetic material nylon, which was first developed by Dupont in the 1930s. The Roanoke plant also became outdated as larger and more modern plants were built by the American Viscose Company in Front Royal, Virginia, and Nitro, West Virginia. Although the Roanoke plant closed in 1958, it is one of only two American Viscose Company plants that survive in the United States and the only remaining plant in Virginia.

CRITERION C: ARCHITECTURE

The American Viscose Plant in Roanoke is also significant on the local level under Criterion C in the area of Architecture as a rare surviving example of a rayon plant in Virginia with a relatively high level of integrity. The siting, size, layout, design, and construction of the plant complex convey an understanding of the manufacturing process involved in the production of artificial silk as well as the magnitude of the workforce and the production capacity of the plant as it evolved over time. Located on a large tract of flat land adjacent to the Roanoke River, the property accommodated what would become the largest textile mill in the southeast during its peak of operations in the late 1920s. The nearby river, as well as numerous springs, provided the water that was integral to the manufacturing process. The layout of the various buildings within the complex, as well as the

functional spaces within each building, was carefully organized to provide for efficient production and a safe and healthy environment for workers and customers. The landscaped public entrance, offices, women's dormitory (demolished), dining halls (for white employees), and dispensary were located at the front of the complex towards the north to be removed from the raw materials, chemicals, and waste water located at the rear of the complex along the river to the south. The coning building and shipping areas for the finished product, with freight doors and loading docks, were also located towards the north side of the complex. The three main processing plants, with their associated power plants and acid storage buildings, were situated in the center of the complex. Railroad spurs extend between the main processing plants, to deliver raw goods, and also run along the north end of the complex to transport the finished product. The filtration plants, water reservoirs, storage and maintenance buildings, as well as the dining room for African American employees, were sited along the river at the south end of the property. Racial segregation of facilities such as dining halls was a matter of course during the Jim Crow era of segregation; retention of the segregated space at the American Viscose plant is important to understanding the landscape of segregation in an industrial setting.

The design and construction of the individual buildings also reflects their function as part of the manufacturing process. The buildings are primarily one-, two-, and three-stories in height, with the exception of the five-story office building. All of the buildings are of fireproof construction and built of either solid brick or concrete block with brick veneer on a concrete foundation. Functional in their design and construction, the buildings are simple with articulation limited to pilasters expressing the structural bays and segmental arches or soldier bricks spanning the window and door openings. Large industrial-sash or glass-block windows and saw tooth skylights or monitors provide abundant natural light to the processing buildings. As ventilation was also critical to the manufacturing process, large fans were located in each building. The three main processing plants each consisted of two identical, independent units. This arrangement allowed for different types of rayon fiber to be produced simultaneously. The large, open areas of the plants housed the spinning operations with the various appendages providing storage for raw materials finishing rooms and employee locker rooms. Although the machinery and equipment have been removed, the walls separating the various functions remain intact with their connecting openings and passageways. The employee locker rooms retain the hooks and pulley systems used to store clothes and lunches high off the ground to protect them from rats. Underground tunnels connected the buildings to allow firefighters to access them from the interior in the event of a fire. The storage and maintenance buildings located at the southern edge of the complex are also of masonry construction. However, these buildings feature smaller windows with double-hung, wood sashes as their functions required security more than natural light.

The American Viscose Plant in Roanoke is also significant in the area of architecture as a relatively intact example of a plant designed by the Ballinger Company. This Philadelphia-based firm was one of the first in the nation to combine the professions of architecture and engineering into one practice. During the first quarter of the twentieth century, the Ballinger Company designed buildings and plants for numerous industries, including the Campbell Soup Company and the Otis Elevator Company. After completing the first plant for the American Viscose Company in Marcus Hook,

Pennsylvania, the company was contracted to design the Roanoke plant in 1916. The firm continued to design most of the buildings in the complex through 1954. Notably, during the construction of the Roanoke plant, Walter Ballinger was working with Clifford H. Shivers on the design and patent of the Super Span saw tooth roof truss.[6] This new roof type made it possible to build large, open spaces with little or no interior columns.[7] Ballinger utilized this type of saw tooth roof throughout the Roanoke plant.

HISTORIC CONTEXT

Acknowledgements

The following historic context, prepared in January 2019 by Hill Studio, relies heavily on the documentation, research, narrative and evaluation provided by Jeffrey L. Holland and M. Todd Cleveland of TRC in their report "Historical and Architectural Documentation of the Former American Viscose Plant and Wasena Park, Roanoke, Virginia" prepared in March 2005 for the Wilmington District of the U.S. Army Corps of Engineers in association with the Roanoke River Flood Reduction Project (DHR File # 1992-0760). The majority of the historic context included in this section consists of excerpts from the 2005 TRC report and are cited as such. Hill Studio supplied additional sections to provide context related to the general development of Roanoke, other American Viscose Company plants in the United States and the Ballinger Company architectural firm.

The Development of Roanoke

Roanoke developed in the late-nineteenth and early-twentieth centuries during a period of tremendous growth and prosperity directly associated with the merger of the Shenandoah Valley and the Norfolk & Western railways and the construction of that firm's new headquarters in Big Lick. The town of Big Lick, which would become present-day Roanoke, emerged as a primary shipping point for the region with the connection of these two lines.[8] The railroad company planned to construct additional tracks, shops, a hotel, and other buildings along the railroad. Because of this commitment, the boundaries of the town expanded to 3.5 square miles in 1882, and the population quickly grew from 600 to over 5,000. In anticipation of the role of the town as an important railroad center, the town changed its name to Roanoke and was chartered as a city in 1882. A period of intense industrial and commercial development ensued, resulting in an incredible population boom between 1880 and 1890.

The area that would become Southeast Roanoke, including the American Viscose Plant, remained rural until the end of the nineteenth century. George P. Tayloe, a prosperous farmer and slave owner, purchased 598 acres along the Roanoke River from his father-in-law John Langhorne in 1833.[9] Circa 1850, Tayloe constructed an impressive, brick, Greek Revival dwelling known as Buena Vista (NRHP 1974) that stands today just north of the American Viscose Plant. Many of the large rural tracts of land surrounding Roanoke, including the Buena Vista tract, were subdivided and sold for development in the early-twentieth century. As industries and businesses opened along the railroad in Southeast Roanoke in the early 1900s, land companies purchased large tracts of land nearby to build houses for the workers.

Roanoke experienced another population boom in the early-twentieth century, with a 62 percent population increase in the first decade. Between 1910 and 1920, Roanoke experienced a 45 percent increase in population. The annexation of the remainder of the Buena Vista tract in southeast Roanoke in 1915 and the subsequent establishment of the American Viscose Plant on 212 acres of this land in 1916-1917 contributed significantly to this growth. In 1917, the streetcar lines shifted from 8th to 9th Street in order to serve the newly opened Viscose Plant. With more than 1,000 new jobs at the viscose plant, the surrounding residential neighborhoods grew to provide additional workforce housing. To accommodate the growing population of families in the area, Morningside Elementary School and Jackson Junior High School were constructed in the 1920s.

The population of Roanoke remained stagnant during the Great Depression, with only a 1 percent increase between 1930 and 1940, compared to the national average of 7.9 percent. The Norfolk & Western East End Shops once again bolstered the local economy during this time as they experienced record orders during the 1930s. Although the American Viscose Plant experienced some temporary layoffs and reduced operations, it also provided economic stability during this period and returned to full production during World War II.

The 1950s began as a prosperous time for Roanoke with postwar population increasing by 32 percent. In 1952, Roanoke was named one of eleven All-American Cities based on a host of civic improvements it had accomplished, including: $4 million in new school construction; the establishment of Mill Mountain Zoo; a new health center; and a new sewage disposal system. In 1957, the city celebrated its Jubilee Anniversary of 75 years. However, this marked the end of the boom as the American Viscose Plant closed in 1958, resulting in the loss of 1,750 jobs. During that same year, the Norfolk & Western Railway converted from steam to diesel engines and another 2,000 jobs were lost. The closing of these two operations had a devastating effect on the surrounding neighborhoods, which originally developed to provide housing for workers in these and associated industries.

Early History of the American Viscose Company

Excerpted from Holland and Cleveland, 2005 (figures and biographical references can be found in the original report)

> The viscose process for the production of "artificial silk," later known as rayon, was patented in England in 1892. The process, described in greater detail below, involves the creation of a viscous solution of wood pulp that is extruded through an opening and precipitated to a solid fiber by the addition of chemicals. The Viscose Development Company, founded in 1894, quickly adapted the fiber to a number of industrial uses, including fabric treatments, rubber goods, paper, and artificial leather. In 1904, Courtauld & Company, Ltd., a well-known London textile firm specializing in silk, purchased the patent for the viscose process and began production in England. Samuel Salvage, an English yarn merchant in the United States, recognized the potential of the product and persuaded Courtauld to make him their exclusive sales agent. Salvage generated enough demand for artificial silk that he felt a plant in the United States could be profitable, and in 1909 he suggested that Courtauld purchase

the U.S. patent to the process and construct a plant there. The company agreed and immediately sent Henry Tetley to the United States with $800,000 for the purpose of constructing the first plant of the American Viscose Company, as the American affiliate of Courtauld was designated (American Viscose Corporation ca. 1960:9–10; *Chester* [PA] *Times* 1951; The Viscose Company 1937:22–24).

The American Viscose Company, renamed The Viscose Company in 1915, completed construction of its first plant in the United States at Marcus Hook, Pennsylvania, south of Philadelphia, in December 1910. The plant initially employed 600 people, and in its first full year of production turned out 362,000 pounds of fiber. Demand for artificial silk continued to increase, outstripping the capacity of the Marcus Hook plant. In 1916, 5.75 million pounds of fiber were manufactured in the United States, but another 2.5 million pounds were imported from England. The war in Europe interrupted production in England, however, and Salvage went to England in 1916 to requests funds from Courtauld & Company to construct a second manufacturing facility in the United States. Without hesitation, Salvage was provided the money, and construction was begun the following year in Roanoke on what would become the company's largest rayon plant. In 1917, U.S. consumption of artificial silk was 7 million pounds, of which The Viscose Company supplied more than 93 percent. The Viscose Company provided about half of Courtauld & Company's profits during the war and eventually surpassed its parent company (*Chester Times* 1951; Ward-Jackson 1941:103–106, 122).

The Viscose Company Plant in Roanoke Established

Excerpted from Holland and Cleveland, 2005 (figures and biographical references can be found in the original report)

The Viscose Company purchased 212 acres in the southeast part of town, adjacent to the Roanoke River, which would be used to provide water for the manufacturing process and a steam plant. The area was largely unsettled, and the promise of jobs at the factory encouraged the construction of houses between the center of town and the plant site. The first unit began operating in the summer of 1917 and employed some 1,000 workers, many of them single women from rural areas around Roanoke. The local newspaper noted that the new plant was of the most modern design and featured fireproof construction, large windows, and a sophisticated ventilation system that forced purified air into the building (*RT* 29 July 1917:1). The photograph in Figure 4 (Ballinger & Perrot 1919) shows the plant after completion of the first unit. The reservoir (part of VHLC 128-240), which provided water for the manufacturing process, is barely visible behind the trees at the far right of the picture. Because the reservoir and first unit share the same job number (see discussion below), it is likely they were built at the same time.

A second unit, attached to and west of the first, was constructed in 1919, almost immediately after the completion of the first unit, increasing the workforce to 1,700. These two units make up the westernmost of the three large processing buildings of the current complex. Figure 5 shows Unit 2 under construction, looking north, with the completed Unit 1 to the right

(Historical Museum of Southwest Virginia 1919). Although the plant manager noted in 1925 that the company employed only white workers, it appears from the photograph that at least some of the construction workers were African American. Note that despite the modern design of the facility and the technical nature of the manufacturing process, the excavation for the building was conducted using horse-drawn wagons and manual labor. Figure 6 shows the plant after the completion of the second unit (Ballinger & Perrot 1920). The photograph does not show the reservoir that was located just out of the picture to the right, but it is depicted on a 1919 Sanborn map of the plant (Sanborn Map Company 1919). The reservoir had a 1,077,000-gallon capacity and was fed by springs and wells according to the Sanborn map.

A water filter house and settling basin were apparently added to the west side of the reservoir soon after 1919. The reservoir itself was updated at the same time, though to what extent or in what manner it is not known. The Ballinger Company was the architectural firm for most of the plant, and the company job numbers assigned to the buildings on a plant map (Figure 7) appear to be sequential by construction date. The filter house, settling basin, and update to the reservoir have the same job number as Unit 2, constructed in 1919 (The Ballinger Company 1954).

Around 1921, construction began on the third and fourth units, which were housed in a second large building to the east of the first two units. The fourth unit began production in 1923. The four units together employed approximately 3,800 people, about 58 percent of them women, and produced 12 to 13 million pounds of artificial silk annually. This represented about 45 percent of the output of The Viscose Company and 35 percent of U.S. production. To provide power for the plant, a 9,000-kilowatt steam plant was built, powered by three turbine generators (American Viscose Corporation ca. 1947; Barnes 1968:627; *Roanoke World-News* [*RWN*] 31 May 1923:2, 29 January 1934:4:12; White 1982:91, 96). This was apparently an expansion of the powerhouse constructed east of Unit 1 for the initial operation of the plant. The expanded powerhouse was located between the two main spinning buildings that housed Units 1 and 2 and Units 3 and 4.

The first detailed view of the No. 1 Filtration Plant (VHLC 128-240) is on the 1923 Sanborn map (Sanborn Map Company 1923), which shows the 1,077,000-gallon reservoir, and the filter house and 280,000-gallon settling basin added in ca. 1920 (Figure 8). The basin was expanded, and a second filter house added soon after completion of the third and fourth units in 1923, based on the Ballinger job numbers. The pump house/acid regeneration water building (VHLC 128-239) and the diluter house/sawdust storage building (VHLC 128-242), documented during the current investigation, do not appear on the 1923 Sanborn map (Sanborn Map Company 1923). They do not have the Ballinger job numbers and, thus, may have been designed by another company. Though The Ballinger Company served as architect for most of the plant buildings, contractors from Roanoke and Lynchburg, as well as in-house crews, did most of the actual work.

In 1925, The Viscose Company announced it was expanding its plant yet again, and would be adding a fifth unit that would employ an additional 1,500 workers over the 4,000 already in place. The new facility would increase the plant's capacity by some 25 percent to 16 million pounds of rayon a year. The construction contract for Unit 5 was awarded to J. P. Pettyjohn and Company of Lynchburg for $3.5 million. At the same time, the construction of the coning building, a 45,500-square-foot shed at the north end of Units 1 and 2, was already under way. The company planned to employ women exclusively in the coning building (*RWN* 30 March 1925:1, 28 May 1925:1; The Ballinger Company 1954). The company also announced that it would begin using cotton linters, the short fibers that remain on the seed after ginning, as raw material in manufacturing rayon, instead of the wood pulp that had previously been used. This news was greeted enthusiastically in the South, where cotton was still a popular crop. It is unclear if cotton was used at the Roanoke plant, however. No other reference to its use was found in contemporary sources or on the Sanborn maps, but a description of the manufacturing process in a 1937 publication notes that pulp, cotton, or a mixture of the two was used in the viscose plants (The Viscose Company 1937). Pulp storage is noted on all of the available maps, so apparently cotton did not replace wood pulp entirely.

As was predicted, the fifth unit was completed within a year, and in May 1926, it began partial operation. The final cost of the project was $5 million, more than 40 percent over budget. When the new unit was fully operational, it was expected that the plant would employ nearly 6,000 workers, making it the largest textile plant in the South and the largest rayon producing plant in the world. This number was apparently never reached, though by 1929 the plant employed 5,500 workers. In September 1927, groundbreaking took place for a sixth and final unit, located directly east of Unit 5. Five months later, the unit was put into operation. It was expected that about half the employees in the sixth unit would be "girls," making the percentage of females in the total workforce about 40 percent (*RWN* 12 September 1927:1, 27 February 1928:1).

The 1928 Sanborn map (Sanborn Map Company 1928) depicts the additional filter house and expanded settling basin constructed at the No. 1 Filtration Plant (VHLC 128-240) ca. 1924. The view is the same on the 1937 Sanborn map (Figure 9). A second water treatment plant, the No. 2 Filtration Plant, was built east of the No. 1 plant in ca. 1926, in connection with the construction of Unit 5. The two plants, which took water from the Roanoke River, had a capacity of 35 million gallons a week. The pump house for the No. 2 plant, visible on the 1928 Sanborn map, was built adjacent to the No. 1 plant at the river's edge (see Figure 7); it no longer survives. At about the same time, a second power plant was constructed east of Unit 6 to support the new facility (*RWN* 12 May 1926:1, 27 February 1928:1). The 1928 Sanborn map is also the first to show the pump house/acid regeneration water building (VHLC 128-239) and the diluter house/ sawdust storage building (VHLC 128-242) (see Figure 9). Labeled as a pump house on the Sanborn map, VHLC 128-239 may have been associated with the acid and carbon disulfide (CS_2) tanks located roughly 60 feet north. The No. 1 and No. 2 Filtration plants had their own pump houses/rooms, so it is unlikely VHLC

128-239 was constructed to serve them. The pump house is labeled "acid regeneration water" on The Ballinger Company 1954 map (see Figure 7), another indication the building may have been associated with the acid/CS_2 tanks to the north or perhaps the cellulose and viscose solution preparation facilities farther north (see technical discussion below). According to the 1954 map, an abandoned water line was located between the building and the river. VHLC 128-242 is identified as a diluter house on the 1928 map and a sawdust storage building on the 1954 map. As a diluter house, its precise function is not known; however, it was located a distance from the main processing areas of the plant and may have been used to dilute waste chemicals before their discharge into the river (*RT* 3 March 1939).

With Unit 6 fully operational, the "silk mill" at Roanoke reached its peak production and employment. Despite increased competition after 1920, when the original patents on the viscose process expired, The Viscose Company's three plants—in Marcus Hook, Pennsylvania, Lewiston, Pennsylvania, and Roanoke—produced over half the rayon made in the United States in 1927. Until 1924, rayon was generally known as artificial silk. Manufacturers determined that a new name was needed to separate the fabric from natural silk; thus, the name rayon was adopted. This change was followed by a series of improvements to the product, including the introduction of dull rayon and creped rayon, which expanded its uses in the marketplace. To produce the dull rayon, a fourth plant of The Viscose Company was opened in Parkersburg, West Virginia, in 1927. Because of these advances, it was determined that a trade group was needed to enforce quality control standards and educate commercial buyers and consumers about the product. Thus, in 1928, the Rayon Institute of America was formed (American Viscose Corporation ca. 1947:36–38; Ward-Jackson 1941:127–129).

The aerial photograph in Figure 10 shows the plant around the peak of operations (Historical Museum of Southwest Virginia ca. 1928). The view is from the northwest, and the No. 1 Filtration Plant (VHLC 128-240) can be seen at the far right center of the photograph. The pump house/acid regeneration water building (VHLC 128-239) can be made out as well, but the diluter house/sawdust storage building (VHLC 128-242) is hidden. The large building in the foreground at left is Crest Hall, the dormitory built for single female workers. The residential development that accompanied the growth of the plant can be seen in the foreground at right.

The Depression hit soon after completion of the sixth unit, although The Viscose Company did not immediately experience a severe downturn. Production in the U.S. plants was down one-quarter in 1930, but product demand continued through the mid-1930s. In May 1932, the company announced it would be giving workers at the Roanoke plant a "holiday," shutting down operations during June. The closing was to allow the company to cut backlogged inventory. Production was gradually increased after the plant re-opened on July 18, and by the end of the year, employment was essentially the same as before. There were 4,800 employees in 1936, and in that year and the year following, wages were increased (Barnes 1968:760; *RWN* 23 May 1932:6, 5 August 1932:1, 8 December 1932:1, 15 April

1937:1; The Viscose Company 1937).

A depression in the textile industry finally affected the synthetic fiber division in the late 1930s. The Viscose Company experienced its first financial loss in 50 years of business in 1938 (American Viscose Corporation ca. 1960:15–16). At the start of the year, the Roanoke plant reduced the workweek of its 4,200 employees to 32 hours. Even so, layoffs were required in March and June, reducing the number of employees to 3,000. The reduction was short-lived, however, and in August it was announced that all of the plant's employees would be called back to work at least 32 hours a week. The sixth spinning unit remained idle, however, and the fifth unit was shut down briefly in April 1939. The need for war materials in Europe led to an increase in fiber orders, and the plant returned to full capacity in October 1939 for the first time since December 1937 (*RWN* 18 March 1938:4, 23 June 1938:1, 9 July 1938:1, 14 August 1938:1).

The upturn in business during the early years of World War II is reflected in the improvements made in 1939. In that year, construction began on an acid reclamation plant, which allowed sulfuric acid to be reused, and decreased the amount of pollution being dumped into the Roanoke River. Pettyjohn Construction Company of Lynchburg built the four-story facility to the south of Units 5 and 6 at a cost of $160,000. A $50,000 caustic soda reclamation plant had been built in 1935 by the B. F. Parrott Construction Company. The Viscose Company increased the capability of the No. 2 Filtration Plant in 1939, adding four concrete filters with a capacity of 2,800 gallons per minute (*RT* 3 March 1939:1, 4 March 1939:4). The machinery of Unit 6 also was refurbished that year, prior to reopening, to improve the consistency of the yarn (*RWN* 5 August 1939:11).

The relative stability of The Viscose Company during the Depression was an important anchor for the local economy. The U.S. Census listed 105 industries in Roanoke city and county in 1939, producing about $40 million worth of goods and employing 7,754 workers. The Roanoke viscose plant produced $16 million worth of rayon in 1940, representing about 40 percent of the total value of manufactured goods in the area. This is a significantly larger portion of the total than in 1927, when the plant was nearing its highest employment level. It is unclear if the number of workers in the census total includes only those in actual production jobs, but the 4,400 employees of The Viscose Company in 1940 clearly represented a significant portion of the area's industrial work force. Only the Norfolk and Western Railroad, with 7,000 workers, was larger (*RWN* 19 April 1940:2; Works Progress Administration [WPA] 1942:201–203).

Advances in technology had made many of the company's older plants obsolete by the 1930s. New investments were made at the plants in Nitro, West Virginia, and Front Royal, Virginia, the latter eclipsing Roanoke's plant as the largest in the world. By 1936, there were 16 companies manufacturing rayon in the United States, but The Viscose Company still dominated the market, supplying 37 percent of the country's rayon needs. In 1937, the company changed its name to the American Viscose Corporation, which remained the largest

rayon producer in the U.S. and the world (American Viscose Corporation ca. 1960:15–17; Ward-Jackson 1941:131).

The investment in new technologies was important, given the unstable political situation in Europe at the end of the 1930s. The demand for industrial and military uses of rayon increased during this period, and the Front Royal factory specialized in making strong rayon fibers used in tires. Fibers for tires, parachute cloth, paratrooper uniforms, self-sealing gas tanks, waterproof covers, and other products were made at the Roanoke plant. The machine shop at the plant was used to fabricate materiel (apparently including guns and gun mounts) for the U.S. Navy and the U.S. Army Ordinance Department (Bishop 1998; WPA 1942). Figure 11 is an aerial view of the plant during World War II taken from the southeast (Fairchild Aerial Surveys 1943). The No. 2 Filtration Plant can be seen in the foreground, but only a portion of the No. 1 Filtration Plant (VHLC 128-240) is visible at the upper left of the photograph. The diluter house/sawdust storage building (VHLC 128-242) is also barely visible, at the river east of the No. 1 Filtration Plant.

In 1944, in an address to the Roanoke Chamber of Commerce, LeRoy Smith, plant manager, anticipated that American Viscose could continue to produce important items in the post-war economy, including hosiery yarn and tire fabric, but it would need to repair, replace, and modernize its equipment (Smith 1944). Unfortunately, the plant was not able to realize Smith's optimistic prediction after the war. Orders for the type of rayon made at the plant declined as new manmade fibers were introduced, and technological changes resulted in cuts in the number of employees. Significant business slumps hit the plant in 1951 and 1954, and employment gradually declined to around 3,000. By 1958, when the company announced it was closing the plant, employment had fallen to less than 2,000, dropping the plant to third among Roanoke industries behind the Norfolk and Western Railroad and General Electric, which had opened a plant between Roanoke and Salem in 1956 (Bruce 1988:173; *RWN* 4 August 1958a:1).

The plant's shutdown was a severe blow to the local economy. Even before the closing, unemployment in Roanoke had moved above the national average. The situation was further exacerbated in 1959 by the closing of the Norfolk and Western steam engine shops. That year, steam engines were replaced system-wide by diesels (Bruce 1988:173; *RWN* 4 August 1958b:1).

American Viscose Corporation salvaged much of the plant equipment and offered the buildings and land for sale, in hopes of finding a buyer that could lease the facilities to several different concerns, since only a handful of U.S. companies could use a facility the size of Viscose. Union Carbide took an option on the property in July 1959 but dropped the deal less than a month later. It was not until 1961 that the remaining equipment was auctioned off and the property purchased by a consortium of Roanoke corporations and investors. This group created the Industrial Development and Investment Company to manage the former Viscose plant and renamed it the Roanoke Industrial Center (RIC). A variety of businesses took up

residence in the RIC, and in 1998 it included about 60 firms employing roughly 1,200 people (Bishop 1998; Vaught 1959).

On the whole, the effects of the shutdown could not be considered catastrophic, at least not for Roanoke, though perhaps they were for individual employees. There were several mitigating factors to the closing, including the age of the employees, the company severance package, and an active chamber of commerce. These are discussed in greater detail in the next section.

Employee Welfare at "The Silk Mill"

Excerpted from Holland and Cleveland, 2005 (figures and biographical references can be found in the original report)

Adult men filled management positions as well as jobs requiring heavy physical labor at The Viscose Company, but the plant also employed a large number of minors and women. By 1935, Virginia law prohibited children under 14 from working in industry and limited the work hours of those aged 14 to 16. Women were restricted to 10 work hours a day but were permitted to work night shifts; there were no restrictions on men's hours. In the late 1920s, children as young as 10 apparently were permitted to work, though perhaps not in factories. A 1928 industrial survey of Roanoke by the Chamber of Commerce touted the large labor pool available in the surrounding area, which included many young people. The percentage of the population 10 years old and older usefully employed in all occupations was reported to be 40 percent in 1920 and roughly 49 percent in 1928, "making allowance for the Viscose plant," which may have discontinued the employment of those under 16 about this time. The report also touted Roanoke's low African American population compared to the rest of the state and Lynchburg. As encouragement to potential industries, it noted the relative conservatism of the area's businesses when it came to "welfare enterprises," which it was generally felt should be confined to "protective and economic matters: that is, to those things which make for the health and safety of workers, or which save [the company] money." Apparently, the city's manufacturers felt that "paternalism was to be avoided" ([Roanoke] Chamber of Commerce 1928:6, 22–23). A similar report by the Chamber about seven years later stated that Roanoke experienced no labor problems and had a workforce of primarily native born whites, although there were plenty of "negro men and women" available for menial jobs (Roanoke Chamber of Commerce ca. 1935).

The Chamber of Commerce survey indicated that more industries employing women were needed in Roanoke, such as tobacco plants and boot and shoe factories ([Roanoke] Chamber of Commerce 1928:9). The railroad industries likely used men only for heavy manufacturing. The survey found that the percentage of employed women versus employed men was 36 percent in Roanoke, compared to 50 percent in Richmond and 60 percent in Lynchburg. This made The Viscose Company one of the city's most significant employers of women.

The large number of young women working at the factory (called "girls" in most company literature and newspapers of the time[10]) created a potential sociological problem, since many

were "unused to city ways" (Barnes 1968:613). In 1922, at a cost of $500,000, the company built Hillcrest Hall (sometimes just Crest Hall), a dormitory for young female employees (see Figure 10). *The Roanoke Times* reported at the opening that it was "said to be the most modern, up-to-date, and complete building of its kind in the South" (*RT* 14 September 1922). The four-story brick building housed a lounge, library, cafeteria, bakery, gymnasium, and infirmary and could accommodate over 200 girls. At the time, roughly 1,000 girls worked at the plant. An additional wing of the plant built in 1925 was expected to utilize girls exclusively (*RWN* 30 March 1925:1).

The Viscose Company often was cited in the local papers for its community spirit and dedication to health and safety issues. Although newspapers were typically boosters of local industries because of the financial benefits they provided to an area, the evidence supports the contention that despite the use of child labor during the early 1920s, the Viscose factory in Roanoke was not a "sweat shop," at least by the standards of the time. Each employee paid into a Mutual Benefits Association, and the company paid insurance for its employees up to $1,000 as well as modest sick benefits (Landers and Henning 1992:119). The huge floors of the plant were protected by 50,000 sprinklers, fed by a network of underground pipes and a self-contained water system. Landscaped driveways around the offices are visible in contemporary photographs (Figure 12; *RT* 30 November 1936:6:1) and are noted in articles about the plant (*RWN* 30 March 1925:1, 12 September 1927:1). Gardeners were hired to maintain the grounds. Figure 11 shows that the landscaping did not extend to the south end of the plant, though this was likely due to the industrial activities taking place there. An illustrated view in a 1929 company publication (Figure 13; The Viscose Company 1929) shows green lawn extending to the river, but this was clearly not the case. The company also provided a 2,000-seat cafeteria that operated 24 hours a day, a mess hall, an infirmary, and ball fields, which at one time included a bowling green. There also were company-sponsored social and athletic events for the employees (Roanoke Public Library, n.d.; *Roanoke Times & World-News* 1982:I:95; *RWN* 31 May 1923:2). Bruce (1976:117) credits the English-born management with the promotion of a pleasant work environment.

The Viscose Company does not appear to have been overly paternalistic, however. With the exception of the women's dorm, the company did not construct housing for its workers and apparently placed no restrictions on their activities outside of work. The long-time manager of the plant, H. C. Neren, commented in a newspaper article in 1925 that more inexpensive housing was needed in Roanoke for blue-collar workers. In the same article it was noted that "almost the whole area between the plant and the center of the city is well settled" (*RWN* 30 March 1925:1).

The plant experienced few labor problems. Nationwide strikes in the 1920s did not affect Roanoke much, though Norfolk and Western workers struck in 1922, including about 4,000 in Roanoke (White 1982:96). Viscose employees walked out in 1919 to gain recognition of the textile union there, and some violence occurred (Barnes 1968:559). The company apparently agreed to recognize the union, but no other mention of its activities was found

until 1937, when the Textile Workers Organizing Committee (renamed the Textile Workers Union of America in 1939) secured an agreement with The Viscose Company and Viscose Corporation of Virginia to raise wages by 10 percent and provide a one-week paid vacation after one year of service. A five percent raise had been granted in 1936 according to a *Roanoke World-News* article, but it is not clear if the union was responsible. American Viscose already was in compliance with other provisions of the 1937 agreement, including a 40-hour workweek, an 8-hour day, and a restriction against employing children under 16, which had not occurred since about 1927, according to the plant manager (*RWN* 15 April 1937:1).

Tensions developed between the local chapter of the Textile Workers Union of America and the company as a result of technological changes made at the plant in 1939. The union threatened to terminate its previous agreement because American Viscose Corporation was violating its promise to hire workers laid off by earlier closings. The union also contended that the company had discouraged union membership, discriminated against union members, and failed to comply with decisions handed down by arbitrators. A collective bargaining agreement in December 1939 secured a company-wide wage increase of six percent, resulting in an increase of $300,000 in the Roanoke plant's payroll (*RWN* 6 December 1939:1). At the same time, the company announced it was expanding its on-site medical services to include a staff physician, a 24-hour nursing service, and modernization of the dispensary to include new treatment rooms, an emergency operating room, an x-ray room, and a laboratory (*RT* 6 August 1939:34, 18 October 1939:5).

The closing of the plant in 1958 was something of a shock to local officials and the Textile Workers Union, but those who commented on the closure seemed to feel it was an economic necessity and that the company's efforts to support its former workers were adequate. Severance pay for those laid off was based on salary. Of the last group of workers to be released, most had served long enough to be eligible for the maximum of $28 for 18 weeks. Life insurance, hospitalization, and other benefits were covered through year's end (*RWN* 4 August 1958a:1, 4 August 1958b:1, 4 August 1958c:1, 20 December 1958). A *Roanoke World-News* editorial stated, "All of us can be thankful that the company is one with a heart and with a decent regard for humanitarian principles" (*RWN* 20 December 1958).

A 1963 study of former American Viscose workers found that only about 13 percent who were still employable had not found new work. About 57 percent were employed but were paid on average 28 percent less than they previously earned. This was due to the fact that their skill with rayon production was no longer in demand in the marketplace. Approximately 30 percent had left the job market, including retirees, those who had died, the ill or disabled, and women who had returned to housework. The local business community also had been active in recruiting jobs to Roanoke to absorb some of the laid-off workers (Poff 1963).

The Viscose Process

Excerpted from Holland and Cleveland, 2005 (figures and biographical references can be found in

the original report)

This section describes the industrial process used at American Viscose Corporation's Roanoke plant to produce rayon from cellulose fiber. The three buildings investigated during the current project were support buildings and do not have any unique features relative to the manufacture of rayon. Nevertheless, they were part of the overall production process. The following discussion is drawn from industry publications and other sources (American Viscose Corporation ca. 1947, ca. 1960; *RT* 11 September 1938; The Viscose Company 1929, 1937; Ward-Jackson 1941).

The development of rayon was a direct result of efforts to duplicate the process of silk production by silkworms. The French chemist, Count de Chardonnet, recognized that silkworms used cellulose from mulberry leaves to create silk fibers, and he attempted to reproduce the process in the laboratory. Essentially, the process involved dissolving wood pulp in a caustic soda solution, then pressing or drawing it into a thread precipitated in a chemical solution. The process was modified and improved during the late nineteenth and early twentieth centuries. Variations of the process and the chemicals used were developed for creating different types of fibers. The viscose process was the most common method of producing rayon and was the method used at Roanoke by The Viscose Company, which took its name from the process.

Preparation of the Cellulose and Viscose Solution. Wood pulp from spruce was the most common source of cellulose. In some cases, cotton fiber was added. The wood pulp at Roanoke was generally imported from Maine, Washington, and Canada and was delivered to the plant by rail. The pulp was prepared at The Viscose Company's plant in Nitro, West Virginia. The preparation involved cooking the pulp in a chemical solution to remove the resin, gums, and foreign matter from the pure cellulose; washing it of chemicals; bleaching it; and drying it by squeezing it through rollers to form paper-like sheets.

After the pulp sheets arrived at the Roanoke plant, they were "mercerized" in vats of a caustic soda solution to form alkali cellulose. The caustic soda was then drained and forced from the cellulose by a hydraulic press (Figure 14). The cellulose sheets were then placed in a machine with revolving blades that cut them into "crumbs." The crumbs (Figure 15) were placed in large pans to age for approximately 48 hours. The caustic soda continued to react with the cellulose, and the aging process was carefully monitored to ensure consistency in the finished product. The last step before the creation of the viscose solution was to produce cellulose xanthate by adding liquid carbon disulfide (CS_2) to the alkali cellulose in a large, revolving churn (Figure 16). This created an orange, plastic substance that was more easily dissolved.

The cellulose xanthate was liquefied by placing it in a large vat filled with a diluted amount of caustic soda and thoroughly mixing it to form a glutinous solution with a honey-like consistency (Figure 17). The solution was further aged in large tanks at a constant temperature, and all impurities and bubbles that might interrupt the spinning process (see below) were removed using a vacuum process.

The Spinning Process. The viscose solution, which at this point was strongly alkaline, was hardened by immersing it in an acidic bath that returned the cellulose to its natural solid form. To create a fiber, the solution was forced into the acid bath through minute holes in a disc of platinum called a spinneret, creating a series of filaments that were drawn away from the spinneret as they hardened. To prevent any solid particles from clogging the holes, the viscose solution was forced through a filter before passing through the spinneret. The process was generally kept up continuously to avoid having to reset the machinery (Figure 18).

The filaments thus created were spun into yarn by one of two processes: spool spinning or box spinning. The Viscose Company used box spinning, which fed the filaments into a rotating box, called a spinning pot, where they were formed into cakes. The filaments passed through a funnel that moved up and down inside the pot, which served to coil them against the sides by centrifugal force and spin them into yarn (Figure 19).

Once a full cake had formed, it was removed from the pot and washed (Figure 20). The yarn was then reeled onto skeins (Figure 21) and further washed, bleached, and dried to complete the process (Figure 22). The skeins were hand-inspected by [female employees] into different grades (Figure 23). Some of the yarn was shipped on skeins to fabric mills for spinning into rayon cloth, while about half was wound onto cones that could be loaded directly on weaving machines. The remaining product was spooled or packaged in other ways depending on the intended use.

Rayon Production and the Roanoke Viscose Plant. The layout of the Roanoke plant reflects the manufacturing process. Each of the three main buildings contains two independent units that carried the process from one end to the other. The six units permitted different types of yarn to be produced in each line, and allowed for changes in production output based on market demand.

Adjacent to the river were two large filtration plants that purified the river water used in the manufacturing process. Any foreign material in the water could clog the spinnerets, so filtration was important. The No. 1 Filtration Plant (VHLC 128-240) was built in three stages as described above, to serve the expanding needs of the plant. The No. 1 plant appears in a 1948 aerial photograph (Figure 24; Historical Museum of Southwest Virginia ca. 1948) as it looked after final construction. A pump house/acid regeneration water building (VHLC 128-239), which may have been associated with the acid and CS_2 tanks to its north, was situated west of the No.1 plant. The No. 2 Filtration Plant, located east of the No. 1 plant, was built after completion of Units 1–4 and likely served Units 5 and 6 primarily. The No. 2 plant pump house was built adjacent to the No. 1 plant at the river's edge (see Figure 7), but it no longersurvives.

Also located at the river was a building (VHLC 128-242) labeled as a diluter house as late as 1948 (Sanborn Map Company 1948) but used for sawdust storage by 1954 (The Ballinger

Company 1954). Other support buildings near the river included grounds maintenance sheds, acid and CS_2 storage tanks, garages, a soda preparation area, and a paint storage building.

To the north of these support buildings ran a series of railroad sidings leading to the major processing areas and storage buildings of the plant. North of the sidings and between the sidings and the large spinning units were the facilities where the viscose solution was prepared. Each of the three pairs of spinning units featured buildings containing soda and pulp storage, pulp cutting machinery, compressors, churns, and mixers. Scattered among these buildings were support facilities not duplicated at each pair of units, such as lead storage and casting buildings, and carpenter, blacksmith, tin, and machine shops. Maintenance facilities were located at the west end of the plant near Units 1 and 2. An acid reclamation facility was built in 1938 at the plant's east end near Units 5 and 6. The first powerhouse was sited between Units 1 and 3. A second, larger powerhouse was built at the plant's east end about the time Units 5 and 6 were completed.

Once prepared, the viscose solution traveled through pipes across an open passageway to the south ends of the massive spinning rooms, where the solution passed through the acid baths. The rayon filaments were then spun into cakes of yarn, which were washed, dried, and transferred to the appropriate area for shipment. The yarn could be spooled on cones or reels, or shipped as cakes, depending on the intended use. The coning building was located at the north end of Units 1 and 2, while the dry reeling building was located at the north end of Units 5 and 6. By 1954, Units 3 and 4 were producing tire cord for Firestone (The Ballinger Company 1954).

Also at the north end of the plant were offices and employee facilities, such as the cafeteria, dispensary, and locker rooms. These were placed near where the finished product was prepared for market, and away from the raw materials and chemicals of the manufacturing process.

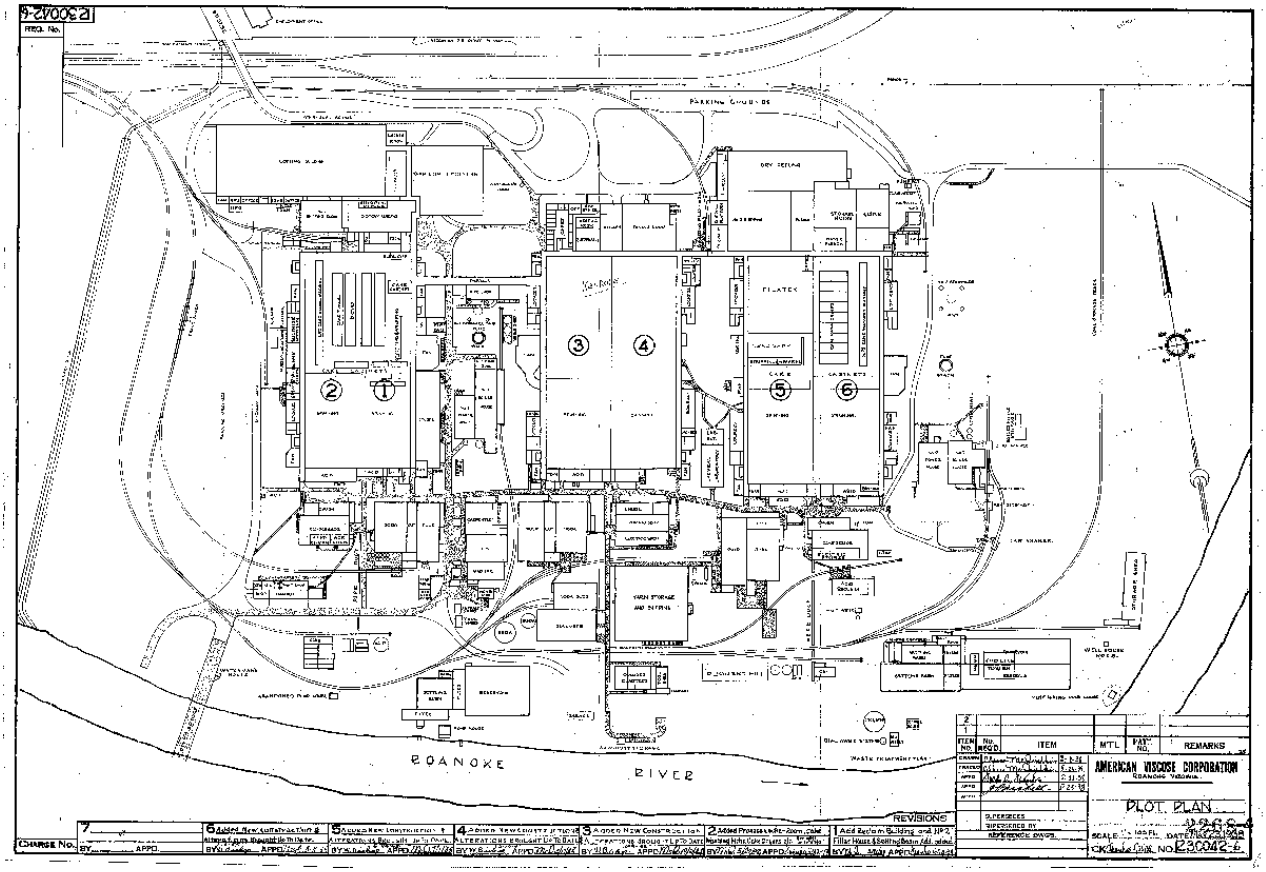
Other American Viscose Company Plants in the United States

The American Viscose Corporation operated six large plants in the United States, including the one in Roanoke. The first plant opened in 1911 in Marcus Hook, Pennsylvania. Over the next five years, demand for rayon steadily grew. In 1916, the United States was still importing 2.5 million pounds of the artificial fiber from England. However, World War I interrupted England's ability to manufacture and export rayon. Therefore, in 1917, Roanoke was the company's second plant to open in order to keep up with the substantial demand for the product.[11] In the mid-1920s, improvements were made to the production of rayon and two new variations of rayon, dull rayon and crepe rayon, were introduced into the market. The opening of plants in Lewiston, Pennsylvania, and Parkersburg, West Virginia, reflect the consumers' interest in both the American Viscose Corporation's traditional and new products. Plants in Nitro, West Virginia, and Front Royal, Virginia, opened in 1937 and 1940, respectively and, utilized new developments in technology.[12] The Marcus Hook plant closed in 1954, four years before the closing of the Roanoke plant in 1958.[13] These plants

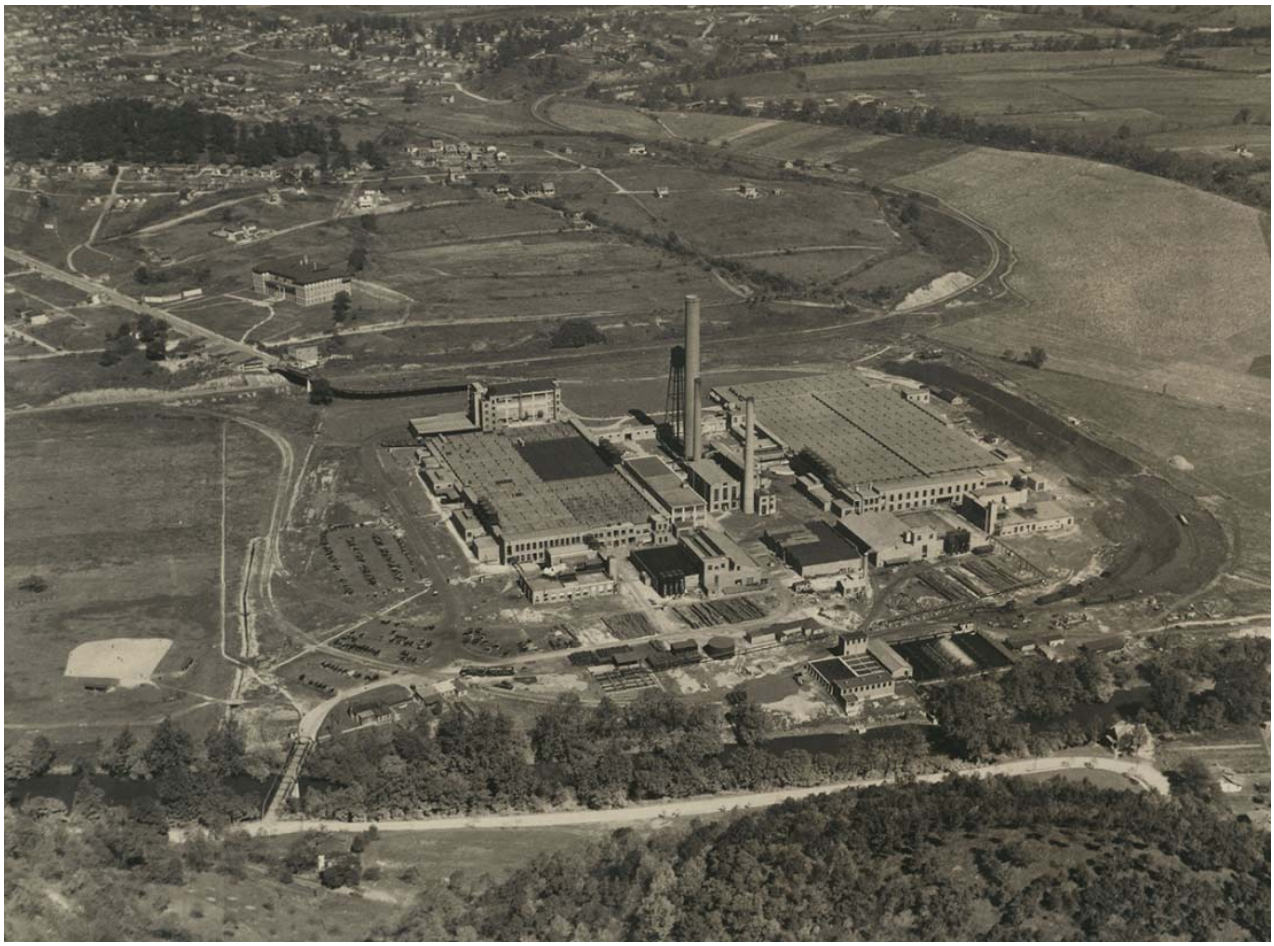
became obsolete with the construction of newer plants. Along with the American Viscose Corporation, the remaining plants were acquired by FMC Corp. in 1963, then by Avtex Fibers in 1976.[14] The plants in Lewiston and Parkersburg closed in 1972 and 1974, respectively.[15] The plant in Nitro continued to operate until 1980 and finally, the plant in Front Royal closed in 1989.[16,] Today, the Marcus Hook plant remains partially intact, with one of its three large processing buildings and several smaller support buildings demolished. The Roanoke plant remains substantially intact. The other plants in Pennsylvania, West Virginia, and Virginia are assumed to have been demolished due to environmental concerns that stemmed from their prolonged operation.

Ballinger Company

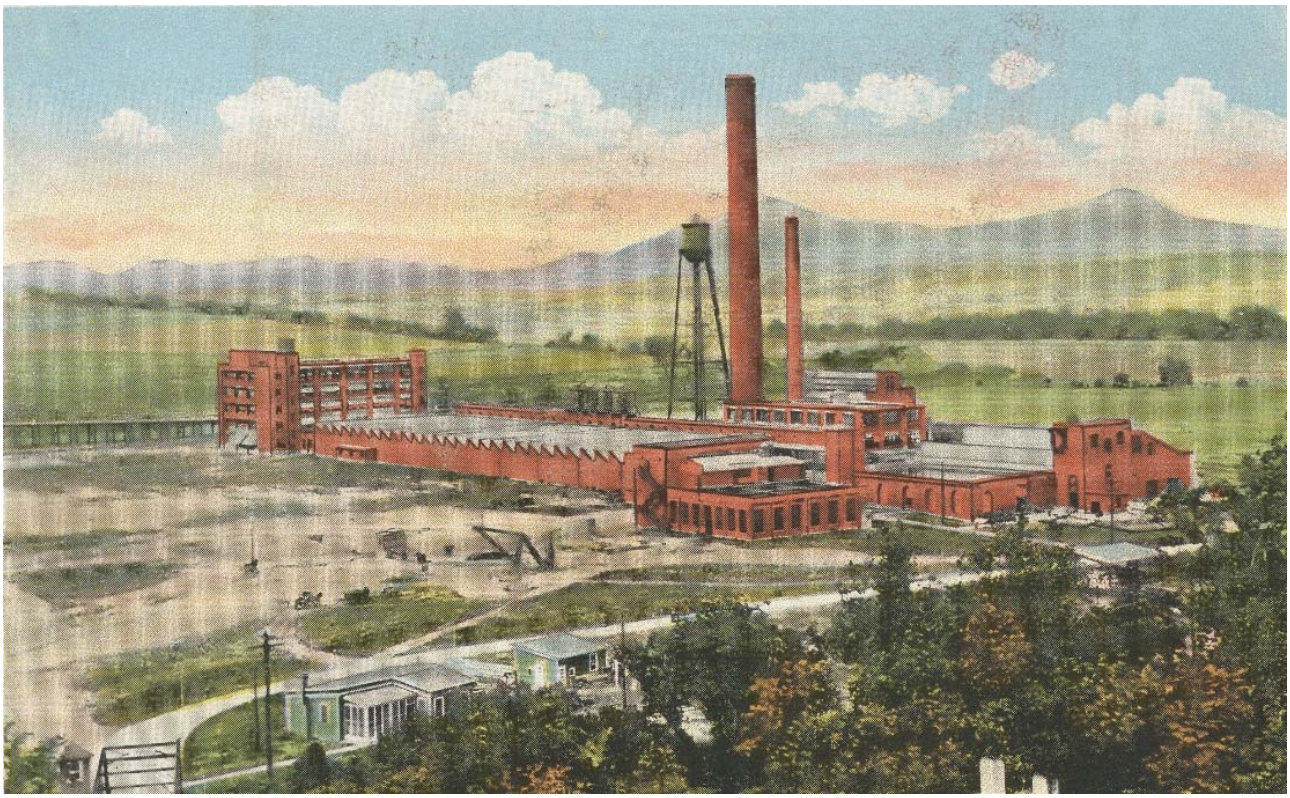
Formed in the late nineteenth century, Ballinger Company is a Philadelphia-based architecture and engineering firm that continues to operate into the present day. According to the AIA Philadelphia website, "Ballinger was one of the first firms in the country to merge the disciplines of architecture and engineering into a professional practice."[17] In 1895, the firm of Hales & Ballinger was formed as a successor firm to Geissinger & Hales, with Edward M. Hales and Walter F. Ballinger as partners. When Hales retired in 1901, the firm reorganized as Ballinger & Perrot with Emile G. Perrot partnering with Ballinger. Ballinger and Perrot co-authored the *Inspector's Handbook of Reinforced Concrete* in 1909, epitomizing the firm's forward-thinking fusion of architecture and engineering. In 1920, Perrot sold his interests and the firm became known as the Ballinger Company. During the first quarter of the twentieth century, Ballinger & Perrot designed numerous notable industrial and commercial buildings for American companies, such as the Victor Talking Machine Company (the Nipper Building), the Joseph Campbell Preserve Company (Campbell Soup Company), the American Ice Company, and Otis Elevator Company.[18] The Ballinger Company designed the American Viscose Company's inaugural plant in Marcus Hook, Pennsylvania.[19] That plant's success prompted the American Viscose Company to hire Ballinger to design most of the company's plant in Roanoke, Virginia. All of the extant buildings, with the exception of the non-historic warehouse, appear on the 1954 Ballinger Company plot plan. Notably, around the time Ballinger was overseeing construction of the Roanoke plant, Walter Ballinger was working with Clifford H. Shivers on the design and patent of the Super Span saw tooth roof truss.[20] This new roof type "could cover a structure 100 feet wide and any length without the use of interior columns, and when supported by columns placed 60 to 88 feet apart, it was suited for even wider buildings."[21] Ballinger utilized this type of saw tooth roof throughout the Roanoke viscose plant on both the large processing buildings as well as some of the smaller support buildings.



Historic Figure 1: American Viscose Plant Plat Map, 1938.



Historic Figure 2: Aerial Photograph of American Viscose Plant, October 1924



Historic Figure 3: Postcard: “Bird’s eye view of the Viscose Silk Mills, Roanoke, Virginia,”

9. Major Bibliographical References

Bibliography (Cite the books, articles, and other sources used in preparing this form.)

Ayers, R. Drummond Jr. "Jobs are Lost in Plant Shutdown, but So Is Foul-Smelling Air." *The New York Times.* November 21, 1989.

"Ballinger." AIA: Philadelphia. https://www.aiaphiladelphia.org/firm/ballinger

Ballinger, Walter F. and Clifford H. Shivers. "Roof Structure." U.S. Patent 15133. Filed May 5, 1920. Reissued June 28, 1921.

Bigart, Homer. "The Talk of Lewistown, Pa." *The New York Times.* October 28, 1972.

Bishop, Mary. "Mill was almost a town unto itself." *The Roanoke Times*. August 23, 1998.

Bradley, Betsy Hunter. *The Works: The Industrial Architecture of the United States.* Oxford University Press, 1999.

Classic Commonwealth: Virginia Architecture from the Colonial Era to 1940. Richmond, VA: The Virginia Department of Historic Resources, 2015.

Denham, Charles J. "Chemical Industry." *e-WV: The West Virginia Encyclopedia.* May 2013.

Hendricks, R.F. "Parkersburg." *e-WV: The West Virginia Encyclopedia.* May 1993.

Holland, Jeffrey L. and M. Todd Cleveland. *Historical and Architectural Documentation of the Former American Viscose Plant and Wasena Park, Roanoke, Virginia: Undertaken for the Roanoke River Flood Reduction Project, Roanoke, Virginia, Final Report.* (DHR File Number 1992-0760). Richmond, VA: The Virginia Department of Historic Resources, 2005.

McCrea, Joan M. *The Re-employment Experience of Workers Displaced in the Closing of the American Viscose Plant at Roanoke, Virginia.* Charlottesville, VA: Bureau of Population and Economic Research Graduate School of Business Administration, 1968.

Sanborn Map and Publishing Company: 1919, 1923, 1934, 1951, 1955. New York, NY: Sanborn Map and Publishing Company.

Tatman, Sandra L. "Walter, Francis Ballinger (1867-1924)." *Philadelphia Architects and Buildings.* The Athenaeum of Philadelphia.

The Magazine of Business, Volume 38. A.W. Shaw Company Division of the McGraw Hill Publishing Company, 1920.

United States International Trade Commission. *Rayon staple fiber from Sweden.* U.S. International Trade Commission, 1983.

Previous documentation on file (NPS):

_X__ preliminary determination of individual listing (36 CFR 67) has been requested
____ previously listed in the National Register
____ previously determined eligible by the National Register
____ designated a National Historic Landmark
____ recorded by Historic American Buildings Survey #_____
____ recorded by Historic American Engineering Record # _____
____ recorded by Historic American Landscape Survey # _____

Primary location of additional data:

_X_ State Historic Preservation Office
____ Other State agency
____ Federal agency
____ Local government
____ University
____ Other
Name of repository: Virginia Department of Historic Resources, Richmond, VA

Historic Resources Survey Number (if assigned): DHR File No. 128-0238

10. Geographical Data

Acreage of Property: 65 acres (approx.)

Use either the UTM system or latitude/longitude coordinates

Latitude/Longitude Coordinates
Datum if other than WGS84:_____
(enter coordinates to 6 decimal places)

1. NW Corner	Latitude: 37.256913°	Longitude: -79.924759°
2. NE Corner	Latitude: 37.255930°	Longitude: -79.917478°
3. SE Corner	Latitude: 37.251956°	Longitude: -79.918055°
4. SW Corner	Latitude: 37.253505°	Longitude: -79.925110°

Or
UTM References
Datum (indicated on USGS map):

☐ ☐

NAD 1927 or NAD 1983

1. Zone: Easting: Northing:

2. Zone: Easting: Northing:

3. Zone: Easting: Northing:

4. Zone: Easting : Northing:

Verbal Boundary Description (Describe the boundaries of the property.)
The historic boundary includes the following tax parcels as recorded by the City of Roanoke, VA: 4170101, 4170102, 4170104, 4170105, 4170106. The true and correct historic boundary is shown on the attached Tax Parcel Map.

Boundary Justification (Explain why the boundaries were selected.)
The historic boundary of the approximately 65-acre historic district are drawn to encompass the American Viscose Plant complex as it existed during the period of significance. The boundaries include its historic setting and all known historic resources.

11. Form Prepared By

name/title: Alison Blanton
organization: Hill Studio, PC
street & number: 120 Campbell Avenue SW
city or town: Roanoke state: Virginia zip code: 24011
e-mail: ablanton@hillstudio.com
telephone: 540-342-5263
date: January 2019

Additional Documentation

Submit the following items with the completed form:

- **Maps:** A **USGS map** or equivalent (7.5 or 15 minute series) indicating the property's location.
- **Sketch map** for historic districts and properties having large acreage or numerous resources. Key all photographs to this map.
- **Additional items:** (Check with the SHPO, TPO, or FPO for any additional items.)

Photographs

Photo Log

Name of Property: American Viscose Plant Historic District
City or Vicinity: Roanoke (City)
State: Virginia
Photographer: Kate Kronau
Date Photographed: January 2019

Description of Photograph(s) and number, include description of view indicating direction of camera:

Photo 1 of 16: Processing Plant #1, view SE
Photo 2 of 16: Ancillary buildings, Power/Boiler House #2, Ventilation Stack #2, view NE
Photo 3 of 16: Ancillary Buildings, Ventilation Stack #2, view north
Photo 4 of 16: Processing Plants #2 + #3, Pulp Warehouse #1, Compressing/Mixing Building #1, Power/Boiler House #2, view east
Photo 5 of 16: Power/Boiler House #2, Processing Building #1, view NW
Photo 6 of 16: Processing Building #2, Compressing/Mixing Building #1, view NW
Photo 7 of 16: Ventilation Stack #2, Power/Boiler House #2, Pump Station, view NW
Photo 8 of 16: Processing Plant #2, view SW
Photo 9 of 16: Auto Repair Building, view SE
Photo 10 of 16: Pulp Warehouse #2, Compressing/Mixing Building #2, view SE
Photo 11 of 16: Passageway and Ventilation Stack #1, view S/SE
Photo 12 of 16: Spring Pump house, view east
Photo 13 of 16: Laboratory, view NE
Photo 14 of 16: Ancillary Buildings, Ventilation Stack #2, view NE
Photo 15 of 16: Chemical Storage Building, view west
Photo 16 of 16: Processing Plant #3, view NW

Index of Figures

Historic Figure 1: American Viscose Plant Plat Map, 1938. Roanoke Engineering Maps & Plans, http://roanokeweb.roanokeva.gov/RoanokeMapsPublic/CityEngrMaps/Public/Large%20Plan%20Numbers/2268-4.pdf

Historic Figure 2: Aerial view of American Viscose Corporation, October 1924. Underwood & Underwood, http://www.virginiaroom.org/digital/document/Underwood25

Historic Figure 3: J.P. Bell Co Postcard, http://www.virginiaroom.org/digital/document/PC96.1

ENDNOTES

[1] Mary Bishop, "Mill was almost a town unto itself." The Roanoke Times, Aug. 23, 1998.
[2] Holland & Cleveland. 11.
[3] Ibid, 11.
[4] Ibid, 23.
[5] Ibid, 43.
[6] Walter F. Ballinger and Clifford H. Shivers, "Roof Structure." U.S. Patent 15133
[7] Betsy Hunter Bradley, *The Works: The Industrial Architecture of the United States*, 193
[8] Jack and Jacobs, 27-28.
[9] Kern, 1990.
[10] Use of the term "girls" was not necessarily limited to female employees under age 18 or 16. Adult women, especially those who were unmarried, often were referred to as girls, too.
[11] Jeffrey L. Holland and M. Todd Cleveland, *Historical and Architectural Documentation of the Former American Viscose Plant and Wasena Park, Roanoke Virginia*, 12
[12] Ibid, 23
[13] Joan M. McCrea, *The Re-employment Experience of Workers Displaced in the Closing of the American Viscose Plant at Roanoke*, Virginia, 5
[14] United States International Trade Commission, *Rayon staple fiber from Sweden*, A-8
[15] Homer Bigart, "The Talk of Lewistown, Pa."; R.F. Hendricks, "Parkersburg", https://www.wvencyclopedia.org/articles/1811.
[16] Charles J. Denham, "Chemical Industry"; B. Drummond Ayres, Jr., "Jobs Are Lost in Plant Shutdown, but So Is Foul-Smelling Air."
[17] AIA Philadelphia, "Ballinger"
[18] *The Magazine of Business, Volume 38*, 1094
[19] Sandra L. Tatman, "Ballinger, Walter Francis (1867-1924)
[20] Walter F. Ballinger and Clifford H. Shivers, "Roof Structure." U.S. Patent 15133
[21] Betsy Hunter Bradley, *The Works: The Industrial Architecture of the United States*, 193