

Environmental Investigation Report

Prepared for:



Southeastern Pennsylvania Transportation Authority

Prepared by:



HDR Engineering, Inc.

In Association With

HNTB
HNTB Corporation

&

LTK
LTK Engineering Services

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1 INTRODUCTION

1.1 PROJECT

The HDR team is required to provide A/E design services that will result in 50% design/build Contract Documents for the rehabilitation of 16 existing traction power substations (TPSSs) that power either the Regional Rail Division (RRD) or the City Transit Division (CTD) of SEPTA's multi-modal transport system, and 100% design Contract Documents for one new RRD TPSS (Woodbourne).

During the May 17, 2016 review meeting between SEPTA and team leadership, SEPTA provided the following guidance for management of hazardous materials:

- In regards to testing of hazardous materials in substations, the contractor shall perform tests as part of their work and assume worst case for estimate. If it turns out less than what was estimated, the difference will be negotiated and credit applied per SEPTA contract requirements.
- HDR Team shall include "Testing Requirements" for lead-based paint, asbestos, PCBs, etc., in the specifications.
- Testing is not necessary during 50% design.
- Asbestos abatement will be performed by SEPTA contractors.
- Assume Lead-based Paint (LBP) will be encapsulated.¹

1.2 PURPOSE

This report has been generated to provide an inventory of hazardous materials at each of the SEPTA TPSS and switching stations. The inventory will be used to provide units and cost for each facility for design beyond the 50% phase.

1.3 LIMITATIONS

- HDR measurements were taken following a visual inspection of the equipment and substation. Due to safety concerns exact measurements were not possible and may require verification.
- Asbestos and lead based paint were identified in equipment at each of the facilities. Information was based on SEPTA and field personnel knowledgeable of the facilities and not from testing. Two options are provided to SEPTA:
 - Assume the equipment with suspect material is asbestos and dispose of the equipment accordingly; or
 - Test the materials to verify the equipment contains LBP and ACM.

It is HDR's opinion that SEPTA should assume the equipment contains ACM and/or LBP and manage accordingly. This will save cost and schedule in the design phase.

- Potential LBP at the facilities is in poor condition. In many areas the paint is peeling and encapsulation may not be possible. For costing purposes, HDR suggests that based on observations the removal of LBP and subsequent encapsulation will be more appropriate.
- No sampling was completed to verify the contents of each transformer.

¹ Encapsulation will not be applicable where paint is peeling off the substrate, as observed at some locations, and on equipment surfaces.

- Cut and fill volumes were not completed within the 50% design phase for each of the substations. It is anticipated that soil will require export from the site. Based on HDR's review of the information and reports provided by SEPTA, exported soil may require handling and management as a hazardous material. Considering the "Worst Case" scenario, when final volumes are calculated the cost should be managed as if all soil will require disposal as a hazardous material.

1.4 SITE RECONNAISSANCE

The AC substations information was provided by Robert Verhelle from HNTB. SEPTA employees provided information to HDR during the site reconnaissance at each substation. HDR completed a site reconnaissance of each of the facilities based on the schedule summarized below:

- December 6, 2016: Market Street, Ranstead, and Ellen substations.
- December 7, 2016: Woodbourne and Castor substations
- December 8, 2016: Broad Street, Park, and Loudon substations.
- December 13, 2016: Bethayres, Yardley, Neshaminy.
- December 14, 2016: 12th Street, 18th Street, and Portal switching stations.
- December 15, 2016: Chestnut Hill East, Hatboro, and Lansdale

Changes at the sites following these dates are not accounted for in this report.

During the site reconnaissance no sampling or field-testing was completed to verify the nature of the material. If information was provided that suspected a hazardous material or an item was suspected to contain asbestos or lead-based paint, the item was quantified. To verify, future sampling may be required, or SEPTA may assume the material will contain the hazardous substance and have it managed accordingly.

2 SUBSTATION SUBSTATION INVENTORIES

2.1 AC TRACTION POWER SUBSTATIONS

2.1.1 Bethayres

This section refers to pictures 1 through 19 in the photo log provided in Appendix 3.1.1.

2.1.1.1 Suspect Asbestos

- Multiple asbestos-wrapped cables, approximately 100 feet each, were located in trenches both inside and outside the facility.
- Based on the age of the building the flashing and roofing material is anticipated to contain asbestos.
- Porcelain insulators, if sent for disposal, should be sampled for Naturally-Occurring Radioactive Materials (NORM).
- 16 - 10'x 6'x6" of suspect transite board was identified on the combined indoor breakers.
- 8 - motor sectionalizing switches possibly contain asbestos transit board
- Control board may contain transite panels, approximately 6'X8'.
- 2 - DC panels with cables potentially wired with transite asbestos insulated cable.
- 4 - Trolley breakers with 4 potential ACM containing arc chutes.

2.1.1.2 Lead-Based Paint

- Paint within the control room is deteriorated and peeling. Due to the condition of the paint and the age of the structure it is likely lead-based paint. Due to the condition of the paint it is unlikely encapsulation will be possible without prior removal of loose lead-based paint.
- Lead-based paint may be present on the outside of the autotransformers. This material is deteriorated and peeling. Stabilization or removal of paint may be required.
- Possible lead-based paint on the gantry structure based upon age of the structure.

2.1.1.3 Non-PCB Based Petroleum

- There is visual evidence of releases from the autotransformers at the facility. Staining and leakage occur within a five-foot radius of the autotransformer pad. Soil removal at the transformer pad is needed during redevelopment.
- 3 - empty 55-gallon drums of dielectric (10C) oil are located within the building.
- 1 - 55-gallon drum approximately ¼ full of 68745 Shell Oil Co. oil is located within the building.
- 1 - Westinghouse Electric two-pole breaker containing approximately 200 gallons of 10C insulating oil.
- 4 - Westinghouse Electric single-pole feeder breakers each containing approximately 200 gallons of 10C insulating oil.
- Potential transformer General Electric Serial Number 1022227 catalogue number 76X306-714 contains approximately 200 gallons of 10C insulating oil.
- Potential transformer General Electric Serial Number 495800, spec number 3166793 contains approximately 10 gallons of 10c insulating oil.
- Auxiliary or distribution transformer Allis Chalmers Serial Number 150187 contains approximately 70 gallons of 10C insulating oil.
- Autotransformer American Brown Boveri Serial Number C117713 contains 1,350 gallons of 10C insulating oil. Weight of the transformer plus oil is 36,750 lbs.
- Transformer serial number unknown, 10C oil, capacity unknown

2.1.1.4 PCB Containing Equipment

No known PCB-containing equipment was identified at this facility.

2.1.1.5 Other Materials

- 60 - lead-acid batteries were located at the substation.
- Mercury-containing temperature gauges on each autotransformer.
- High-pressure sodium mercury lighting.
- 7 - 8 foot fluorescent light fixture with ballast.
- Approximately 200 feet of pressure-treated lumber.
- 16 - wall-mounted dry transformers.
- Various control equipment that contains wiring terminals and circuit boards that utilize lead-based solder. Same applies to vintage telephone(s).
- 16 - wall-mounted capacitors, each containing approximately 1 gallon of oil, are located at the facility. Sampling results needed to determine if 10C oil, PCB oil, or other.

2.1.1.6 Fill Management

Fill material at the substation contains slag material and components that meet the definition of "Historical Fill." To the extent possible, this material should be managed onsite. If this material will require export based on design of the substation, this material will require management pursuant to the Pennsylvania Department of Environmental Protection (PADEP) "Management of Fill" policy document number 258-2182-773.

2.1.1.7 EDR File Review

Listings for the target property:

No EDR listings for target property

Listings for adjacent properties:

HDR evaluated sites located within ¼ mile of the target property.

- Bethayres Pump Station, 550 Welsh Road Huntington Valley, PA. It is listed on the UST database. A 2,000-gallon diesel fuel tank owned by Lower Moreland Township, is in use on the property. The tank is inside the footprint of the AC TPSS. No violations are present.
- Valley Auto Tech (2035 Huntington Pike) is listed on the UST database with two (2) 8,000-gal. gasoline USTs currently in use. No violations are recorded. It is also listed on RCRA-CESQG, LUST, FINDS, and ECHO databases as a Conditionally Exempt Small Quantity Generator. There was a spill reported of petroleum and cleanup completed 12/09/1997.
- 2035 Huntingdon Pike - This site is listed in the EDR Hist Auto database.
- 2337 Philmont Avenue is listed on the SPILLS database. There was a fuel oil spill to ground and Valley Creek of #2 Fuel Oil - data received 4/30/2006
- Evaporated Coatings, Inc. (798 Welsh Road) is listed in the RCRA-CESQG, FINDS, and ECHO databases. It is listed as a Conditionally Exempt Small Quantity Generator.

None of these sites are anticipated to impact site redevelopment.

2.1.1.8 Testing Requirements

- Asbestos sampling and testing to verify the presence of the observed suspected asbestos and allow for quantification of the asbestos remediation effort;
- In-situ testing of areas of suspected lead-based paint (requiring encapsulation) and to determine if peeling paint is lead-based (requiring removal - not suitable for encapsulation); conduct a field survey using X-Ray Fluorescence (XRF) technology;
- Soil sampling and testing in the stained areas around the autotransformer pads for PCBs, SVOCs, and metals;
- Testing of the 16 wall-mounted capacitors for PCBs (EPA method 8081), total halogenated compounds (EPA method 8021B), and metals (Target Analyte List (TAL) metals EPA method 6000 7000 series);
- Testing is required per the PADEP "Management of Fill" policy, if material deemed to be Historic Fill it needs to be exported from the site; and
- Sampling is needed to determine if 10C oil, PCB oil, or other is present in transformers with unknown content.

2.1.2 Neshaminy

This section refers to pictures 20 through 35 in the photo log provided in Appendix 3.1.2. (Clarification for photos 25 and 42; Photo 25 is the cap at the top of an underground storage tank and photo 42 is a monitoring well)

2.1.2.1 Suspect Asbestos

- Multiple asbestos-wrapped cables, approximately 150 feet each, were located in trenches outside the facility.
- Cables to outdoor equipment are also expected to be lined with asbestos.
- Based on the age of the building, the flashing and roofing material is anticipated to contain asbestos.
- 1 - 3'x 8'x1" transite board.
- 4 - feeder breakers with transite in the panels.
- 8 - motor sectionalizing switches possibly contain asbestos transit board.
- 1 - 3'x3'x1" control board - ebony - may contain transite panels.
- 6 - trolley breakers with 4 arc chutes each.

2.1.2.2 Lead-Based Paint

- Paint within the control room is deteriorated and peeling. Due to the condition of the paint and the age of the structure it is likely lead-based paint. Due to the condition of the paint it is unlikely encapsulation will be possible without prior removal of loose lead-based paint.
- Lead-based paint may be present on the outside of the autotransformers, which will be removed
- Possible lead-based paint on the gantry structure based upon age of the structure.

2.1.2.3 Non-PCB Based Petroleum

- 3 - empty 55-gallon drums of dielectric (10C) oil are located within the building.
- 2 - electric two-pole breaker containing approximately 200 gallons of 10C insulating oil.
- 4 - single-pole feeder breakers each containing approximately 200 gallons of 10C insulating oil.
- 1 - potential transformer 24kV General Electric serial number 4965803, spec. 3166794 contains approximately 47 gallons of 10C insulating oil.
- 1 - potential transformer 12kV, General Electric, contains approximately 70 gallons of 10C insulating oil.
- 2 - autotransformers American Brown Boveri with serial numbers C117710 and C117711 contain 1,350 gallons 10C insulating oil each. Weight of each transformer plus oil is 36,750 lbs.
- Staining and oil was observed around the base of the transformers.

2.1.2.4 PCB-Containing Equipment

No known PCB containing equipment was identified at this facility.

2.1.2.5 Other Materials

- 60 - lead-acid batteries were located at the substation.
- Mercury-containing temperature gauges on each autotransformer.
- High-pressure sodium mercury lighting.
- 4 - 8-foot fluorescent light fixtures with ballast
- 2 - boxes 8-foot fluorescent tubes
- Approximately 150 feet of pressure-treated lumber

- High-voltage cleaner, Collinite #237, 3 gallons
- 1 - 5-gallon oil bucket
- 4 - trolley breakers, oil filled. Verification of PCB or 10C oil is required.
- 8 - old capacitors, with potential oil. Verification of PCB or 10C oil is required.
- Identification of oil in crushed stone - slag on ballast, needs to be removed

2.1.2.6 Fill Management

Fill material at the substation contains slag material and components that meet the definition of "Historical Fill." To the extent possible this material should be managed onsite. If this material will require export based on design of the substation, this material will require management pursuant to the PADEP "Management of Fill" policy document number 258-2182-773.

2.1.2.7 EDR File Review

Listings for the target property:

The facility is not listed in any of the EDR Environmental databases.

Listings for adjacent properties:

HDR evaluated sites located within ¼ mile of the target property.

- 1912 Summit Ave is listed on ERNS database. There was release of heating oil into the soil at the owner's home. The issue is closed. This listing does not impact redevelopment of the Neshaminy facility.
- Al's Auto Trevoze Facility (4339 Old Lincoln Hwy) is listed on the RCRA_SQG, FINDS, ICIS and ECHO databases. It is a Small Quantity Generator with no violations listed. This listing does not impact redevelopment of the Neshaminy facility.
- Quality Lumber, Inc. (4258 Bristol Rd) is listed in the PA ACHIVE UST database. It has a 2,000- gal. gasoline tank on the property with no other information reported.

None of these sites are anticipated to impact site redevelopment.

2.1.2.8 Testing Requirements

- Asbestos sampling and testing to verify the presence of the observed suspected asbestos and allow for quantification of the asbestos remediation effort;
- In-situ testing of areas of suspected lead-based paint (requiring encapsulation) and to determine if peeling paint is lead-based (requiring removal - not suitable for encapsulation); conduct a field survey using X-Ray Fluorescence (XRF) technology;
- Testing of the oil in soil under slag or ballast, for PCBs and total petroleum hydrocarbons;
- Testing of the PCB-oil containing equipment for PCBs (EPA method 8081), total halogenated compounds (EPA method 8021B), and metals (TAL Metals EPA method 6000 7000 series);
- Testing of the oil in the breakers and capacitors for PCBs (EPA method 8081), total halogenated compounds (EPA method 8021B), and metals (TAL metals EPA method 6000 7000 series); and
- Testing is required per the PADEP "Management of Fill" policy, if material deemed to be Historic Fill it needs to be exported from the site.

2.1.3 Yardley

This section refers to pictures 36 through 64 in the photo log provided in Appendix 3.1.3.

The proposed location of the pre-engineered building, gantry and outdoor transformers will be located as such to minimize excavation near any existing structure that is to remain in place.

2.1.3.1 Asbestos

- Approximately 150 feet of asbestos-wrapped cables were located in trenches outside the facility.
- Based on the age of the building, the flashing and roofing material is anticipated to contain asbestos.
- 1 - control board – suspect ACM.
- 2 - feeder breakers with transite in the panels, 6 boxes

2.1.3.2 Lead-Based Paint

- Paint within the control room is deteriorated and peeling. Due to the condition of the paint and the age of the structure it is likely lead-based paint. Due to the condition of the paint it is unlikely encapsulation will be possible without prior removal of loose lead-based paint.
- Lead-based paint may be present on the outside of the autotransformers.
- Possible lead-based paint on the gantry structure based upon age of the structure.

2.1.3.3 Non-PCB Based Petroleum

- There is visual evidence of releases from each of the autotransformers at the facility. Staining and leakage occur within a five-foot radius of each autotransformer pad. Soil removal at each transformer pad is needed during redevelopment.
- 2 - two-pole autotransformer Westinghouse breakers containing approximately 200 gallons of 10C insulating oil.
- 2 - single-pole feeder breakers each containing approximately <10 gallons of 10C insulating oil.
- 1 - auxiliary transformer Allis Chalmers Serial number 150186, 70 gallons of 10C insulating oil.
- 3 - 55 gallon oil drums
- 2 - oil waste cans
- 2 -autotransformers American Brown Boveri serial number C117709, and C117708 containing 1,350 gallons 10C insulating oil each. Weight of each transformer plus oil is 36,750 lbs.
- Staining and oil was observed around the base of the transformers.
- 1 - potential transformer 24kV General Electric serial number 4965803, spec. 3166794, contains approximately 47 gallons of 10C insulating oil.

2.1.3.4 PCB Based Petroleum

No known PCB-containing equipment was identified at this facility.

2.1.3.5 Other Materials

- 60 - lead-acid batteries were located at the substation.
- Mercury-containing temperature gauges on each autotransformer.
- High-pressure sodium mercury lighting.
- 3 - 8-foot fluorescent light fixtures with ballasts
- Approximately 150 feet of pressure-treated lumber

- 2 - electric heaters
- 1 - potential transformer with battery charger
- Pressure-treated wood approximately 150 feet
- Various control equipment that contains wiring terminals and circuit boards that utilize lead-based solder.

2.1.3.6 Fill Management

Fill material at the substation contains slag material and components that meet the definition of "Historical Fill." To the extent possible this material should be managed onsite. If this material will require export based on design of the substation, this material will require management pursuant to the PADEP "Management of Fill" policy document number 258-2182-773.

2.1.3.7 EDR File Review

Listings for the target property:

The facility is not listed in any of the EDR Environmental databases.

Listings for adjacent properties:

HDR evaluated sites located within ¼ mile of the target property.

- Yardley Service Center (194 S Main Street, Yardley) is listed on the PA RGA LUST, PA LUST, PA UST, RCRA-CESQG, FINDS, NY MANIFEST and ECHO. There are four 4,000-gal. gasoline USTs currently in use with no violations reported. There was a soil impact from unleaded gasoline UST, cleanup completed 06/05/1997.
- Station Cleaner/Yardley (175 S Main Street, Yardley) is listed on the PA Dry Cleaners, FINDS, and ERNS databases. There are no violations reported.
- J.C. Heating Fuel Oil – Sales & Service (170 S Main Street, Yardley) is listed on the FINDS database. There are no violations reported.
- 166 S Main St, Morrisville is listed on the EDR Hist Cleaner as Canal Cleaners. There are no violations reported.
- 153 S Main St., Morrisville is listed on the EDR Hist Cleaner database as Afton Cleaners. There are no violations reported.

None of these sites are anticipated to impact site redevelopment.

2.1.3.8 Testing Requirements

- Asbestos sampling and testing to verify the presence of the observed suspected asbestos and allow for quantification of the asbestos remediation effort;
- In-situ testing of areas of suspected lead-based paint (requiring encapsulation) and to determine if peeling paint is lead-based (requiring removal - not suitable for encapsulation); conduct a field survey using X-Ray Fluorescence (XRF) technology;
- Testing of the PCB-oil containing equipment for PCBs (EPA method 8081), total halogenated compounds (EPA method 8021B), and metals (TAL metals EPA method 6000 7000 series);
- Testing of the stained soil around autotransformers and PCB-oil containing equipment, for PCBs (EPA method 8081), total petroleum hydrocarbons (EPA method 8021B), and metals (TAL metals EPA method 6000 7000 series); and
- Testing is required per the PADEP "Management of Fill" policy, if material deemed to be Historic Fill it needs to be exported from the site.

2.1.4 Chestnut Hill East

This section refers to pictures 65 through 78 in the photo log provided in Appendix 3.1.4.

2.1.4.1 Suspect Asbestos

- Approximately 51 feet of visible asbestos-wrapped cables were located in trenches outside the facility. Additional cable may be present but not accessible.
- Based on the age of the building, the flashing and roofing material is anticipated to contain asbestos.
- 4 – control boxes approximately 2'x3' containing transite board.

2.1.4.2 Lead-Based Paint

- Paint within the control room is deteriorated and peeling. Due to the condition of the paint and the age of the structure it is likely lead-based paint. Due to the condition of the paint it is unlikely encapsulation will be possible without prior removal of loose lead-based paint.
- Lead-based paint may be present on the outside of the autotransformers, which will be removed.
- Possible lead-based paint on the gantry structure based upon age of the structure.

2.1.4.3 Non-PCB Based Petroleum

- There is visual evidence of releases from the autotransformer at the facility. Staining and leakage occur within a five-foot radius of each autotransformer pad. Soil removal at each transformer pad is needed during redevelopment.
- 1 - autotransformer American Brown Boveri serial number C117707 contains 1,350 gallons 10C insulating oil. Weight of transformer plus oil is 36,750 lbs. Staining and oil was observed around the base of the transformer.
- 1 - two-pole autotransformer breaker containing approximately 200 gallons of 10C insulating oil.
- 1 - single-pole feeder breaker containing approximately 200 gallons of 10C insulating oil.
- 1 - trolley breaker, Westinghouse, 200 gallons 10C insulating oil
- 1 - potential transformer 24kV approximately 75 gallons 10C oil.
- 1 - potential transformer 12kV, Eastern Electric approximately 75 gallons 10C oil.
- 3 - 55 gallon oil drums

2.1.4.4 PCB-Containing Equipment

No known PCB-containing equipment was identified at this facility.

2.1.4.5 Other Materials

- 60 - lead-acid batteries were located at the substation.
- Mercury-containing temperature gauges on each autotransformer
- 2 - 8 foot fluorescent light fixtures with ballast
- Approximately 51 feet of pressure-treated lumber
- 2 - windows – potential PCB (caulk)
- 1 - tar can, 5 gallons
- 1 - fire extinguisher

2.1.4.6 Fill Management

Fill material at the substation contains slag material and components that meet the definition of "Historical Fill." To the extent possible this material should be managed onsite. If this material will require export based on design of the substation, this material will require management pursuant to the PADEP "Management of Fill" policy document number 258-2182-773.

2.1.4.7 EDR File Review

Listings for the target property:

The facility is not listed in any of the EDR Environmental databases.

Listings for adjacent properties:

HDR evaluated sites located within ¼ mile of the target property.

- Two facilities are listed in the immediate vicinity of the substation. The Brooks Harmon Historical Auto Station was located < 1/8 mile from the target site. Excel Cleaners was also located < 1/8 mile of the target property. The Brooks Harmon facility was located at 96 Bethlehem Pike. The location of Excel Cleaners is East Chestnut Hill Avenue and Bethlehem Pike. Based on the distance of these facilities from the substation it is not anticipated that they would pose a concern for property redevelopment.
- Med(ical) Bldg(Building) (33 E Chestnut Hill Ave) is listed in the ACT2-DEED database.
- 58 Newton St is listed on the ERNS database.

None of these sites are anticipated to impact site redevelopment

2.1.4.8 Testing Requirements

- Asbestos sampling and testing to verify the presence of the observed suspected asbestos and allow for quantification of the asbestos remediation effort;
- In-situ testing of areas of suspected lead-based paint (requiring encapsulation) and to determine if peeling paint is lead-based (requiring removal - not suitable for encapsulation); conduct a field survey using X-Ray Fluorescence (XRF) technology;
- Testing of the stained soil around the autotransformer for PCBs (EPA method 8081), total petroleum hydrocarbons (EPA method 8021B), and metals (TAL metals EPA method 6000 7000 series); and
- Testing is required per the PADEP "Management of Fill" policy, if material deemed to be Historic Fill it needs to be exported from the site.

2.1.5 Lansdale

This section refers to pictures 79 through 102 in the photo log provided in Appendix 3.1.5.

2.1.5.1 Suspect Asbestos

- Approximately 150 feet of asbestos-wrapped cables were located in trenches outside the facility.
- All other outside cables are wrapped in asbestos approximately 150 feet.
- Based on the age of the building the flashing and roofing material is anticipated to contain asbestos.
- 1 - potential transite along breaker cabinet
- 2 - potential transite arc chutes

- 1 - ebony board breaker 2' x 2'
- 4 - transite board 2' x 2'

2.1.5.2 Lead-Based Paint

- Paint within the control room is deteriorated and peeling. Due to the condition of the paint and the age of the structure it is likely lead-based paint. Due to the condition of the paint it is unlikely encapsulation will be possible without prior removal of loose lead-based paint.
- Lead-based paint may be present on the outside of the autotransformers. Lead based paint, if present may need to be removed.
- Possible lead-based paint on the gantry structure based upon age of the structure.
- Storage room is a possible source of LBP.

2.1.5.3 Non-PCB Based Petroleum

- There is visual evidence of releases from each of the autotransformers at the facility. Staining and leakage occur within a five-foot radius of each autotransformer pad. Soil removal at each transformer pad is needed during redevelopment.
- 2 - two-pole autotransformer breaker containing approximately 200 gallons of 10C insulating oil.
- 3 - single-pole feeder breaker containing approximately 200 gallons of 10C insulating oil.
- 3 - trolley breaker, Westinghouse, 200 gallons 10C insulating oil
- 1 - potential transformer 24kV, 30 gallons oil
- 1 - potential transformer 12kV, 25 gallons oil
- 1 - distribution transformer, Allis Chalmers serial number 3390187, 85 gallons of oil.
- 2 - signal power transformers, 30 gallons oil
- 1 - 10kVA transformer, approximately 30 gallons of 10C oil
- 1 - 2 gallon gas can
- 2 - autotransformers American Brown Boveri serial number C117700 and C117701 contains 1,350 gallons each. Weight of each transformer plus oil is 36,750 lbs., staining and oil was observed around the base of the transformer.
- 1 - autotransformer Niagara 1036239, 2,726 gallons mineral oil

2.1.5.4 PCB-Containing Equipment

No known PCB-containing equipment was identified at this facility.

2.1.5.5 Other Materials

- 60 - lead-acid batteries were located at the substation.
- 4 - 48V lead-acid
- 5 - 8 foot fluorescent light fixture with ballast
- Approximately 150 feet of pressure-treated lumber
- 1 - window - potential PCB (caulk)
- 7 - 55 gallon drums, 2 full, 2 empty, 3 partial

2.1.5.6 Fill Management

Fill material at the substation contains slag material and components that meet the definition of "Historical Fill." To the extent possible this material should be managed onsite. If this material will require export based on design

of the substation, this material will require management pursuant to the PADEP "Management of Fill" policy document number 258-2182-773.

2.1.5.7 EDR File Review

The facility is not listed in any of the EDR Environmental databases.

Listings for adjacent properties:

HDR evaluated sites located within ¼ mile of the target property.

- Rite Aid #00183 (10 West Main Street) is listed on the PA MANIFEST, RCRA-CESQG, FINDS, and ECHO databases. It is classified as a Conditionally Exempt Small Quantity Generator. No violations are reported.
- 12 N Broad Street is listed on the EDR Hist Auto database.
- Mobil Oil 16 DKG (Main & N Broad) is listed on the PA RGA LUST database. No violations are listed.
- 60 Montgomery Ave is listed as Sears Automotive on the EDR Hist Auto database.
- McQuillan Studios (Broad & Main Streets) is listed on the PA RGA LUST database.
- 6 S Broad is listed as Joe Preston Auto Repair on the EDR Hist Auto database.
- Kiesers Don Tire Store (10 S Broad St) is listed on the RCRA-SQG, FINDS, and NY MANIFEST databases as a Small Quantity Generator. No violations are reported.
- Exxon RS 2 3198 (21 S Broad St) is listed on the PA LUST and PA RGA LUST databases. The site has been inactive since 1997.
- 8 E Main St is listed on the EDR Hist Auto database as previously being a Mobil gas station.
- Lukoil 69223 (8 E Main St) is listed on the PA LUST, PA UL, PA RGA LUST databases. There are currently three 10,000-gallon gasoline UST located on the property.
- Del-VAL International Trucks (S Broad St) is listed on the RCRA-SQG and NY MANIFEST databases. No violations are reported.
- Mobil Oil Corp SS# DKG (Main & Broad Sts) is listed on the RCRA-SQG, FINDS, and ECHO databases. No violations are reported.
- 209 N Broad St is listed as being J & J Cleaners & Tailors on the EDR Hist Cleaner database.
- Lansdale Boro MS4 UA/Demo Site (1 Vine St) is listed on the FINDS database.
- JD Fedele Const. Demolition Inc (1 Vine St) is listed on the FINDS database.
- 101 S Broad St. is listed on the EDR Hist Auto database.
- Core States Lansdale OFC (210 W Main St) is listed on the PA LUST

None of these sites are anticipated to impact site redevelopment.

2.1.5.8 Lansdale Spill Release November 2016

In November 2016, an explosion and subsequent release of transformer oil occurred at one of the autotransformers at the Lansdale Substation. SEPTA called in a release and initiated remedial activities including the removal of impacted soils. On November 16th 2016, a Waste Characterization sample was collected for SEPTA System Safety.

The results of the analytical report identify PCBs and lead within the soil collected. Soil contained 75 ug/kg of Aroclor-1260. Lead is likely associated with paint chips from the gantry structure, based upon age of the structure. Lead concentrations for Toxicity Characteristic Leaching Procedure (TCLP) in the upper layer of soils exceeded hazardous criteria of 5ppm, however the soils removed for the foundation did not exceed the hazardous criteria.

This is being managed under a separate SEPTA contract through the central office.

2.1.5.9 Testing Requirements

- Asbestos sampling and testing to verify the presence of the observed suspected asbestos and allow for quantification of the asbestos remediation effort;
- In-situ testing of areas of suspected lead-based paint (requiring encapsulation) and to determine if peeling paint is lead-based (requiring removal - not suitable for encapsulation); conduct a field survey using X-Ray Fluorescence (XRF) technology; and
- Testing of the stained soil around the autotransformer for PCBs (EPA method 8081), total petroleum hydrocarbons (EPA method 8021B), and metals (TAL metals EPA method 6000 7000 series); and
- Testing is required per the PADEP "Management of Fill" policy, if material deemed to be Historic Fill it needs to be exported from the site.

2.1.6 Hatboro

This section refers to pictures 103 through 109 in the photo log provided in Appendix 3.1.6.

2.1.6.1 Suspect Asbestos

- Hatboro substation has no structures and it is unlikely that any ACM is present at the facility.

2.1.6.2 Lead-Based Paint

- Lead-based paint may be present on the outside of the autotransformers. Lead based paint, if present may need to be removed.

2.1.6.3 Non-PCB Based Petroleum

- 1 - two-pole autotransformer breaker containing approximately 200 gallons of 10C insulating oil.
- 5 - auxiliary transformer, Allis Chalmers, 70 gallons each.
- Feeder breakers combined 200 gallons
- Trolley breaker, Approximately 75 gallons 10C oil.
- Slag soil base
- 1 - autotransformer, American Brown Boveri serial number C117702 contains 1,350 gallons 10C insulating oil. Weight of transformer plus oil is 36,750 lbs., staining and oil was observed around the base of the transformer.

2.1.6.4 PCB-Containing Equipment

No known PCB-containing equipment was identified at this facility.

2.1.6.5 Other Materials

- No structures are present at the Hatboro facility. No storage areas are present to contain other hazardous materials.

2.1.6.6 Fill Management

Fill material at the substation contains slag material and components that meet the definition of "Historical Fill." To the extent possible this material should be managed onsite. If this material will require export based on design

of the substation, this material will require management pursuant to the PADEP "Management of Fill" policy document number 258-2182-773.

2.1.6.7 EDR File Review

Listings for the target property:

The facility is not listed in any of the EDR Environmental databases.

Listings for adjacent properties:

HDR evaluated sites located within 1/8 mile of the target property.

- 17 S Penn St is listed on the EDR Hist Auto database as Hugh Frank Auro Repair. There are no violations reported.
- Gardner House Apt/Hatboro (50 S Penn Street) is listed on the FINDS database.
- 102 E Moreland Ave. is listed on the EDR Hist Cleaner as Rehoboth Dry Cleaners.
- Big Johns Texaco (133 S York & Byberry Rds.) is listed on the PA RGA LUST and PA LUST databases. Clean-up from a UST containing petroleum was reported completed on 07/21/1995.
- North Parking Lot (117 E Moreland Ave) is listed on the PA AST database with a 4,000-gal. gasoline AST and a 4,000-gal. diesel fuel AST currently in use and registered.
- 401 13th Jacksonville Road is listed on the EDR Hist Auto database at MAACO Auto Painting and Body-works.
- Hatboro Ctl Ofc at 29 East Moreland Avenue is listed within the UST database. The tank is active but is not listed as having a release.
- Verizon Inc. Hatboro Ctl Ofc is also located at 29 East Moreland Road. The facility is listed on the ICIS and US AIRS databases.

None of these sites are anticipated to impact site redevelopment.

2.1.6.8 Testing Requirements

- Testing of the stained soil around the autotransformer for PCBs (EPA method 8081), total petroleum hydrocarbons (EPA method 8021B), and metals (TAL metals EPA method 6000 7000 series); and
- Testing as required per the PADEP "Management of Fill" policy, if material deemed to be Historic Fill it needs to be exported from the site.

2.2 AC SWITCHING STATIONS

2.2.1 12th Street

This section refers to pictures 110 through 118 in the photo log provided in Appendix 3.2.1.

2.2.1.1 Suspect Asbestos

- Ceiling tiles - 2' x 2', possible asbestos
- Ceiling/walls - dust/dirt from brakes, possible asbestos and heavy metals

2.2.1.2 Lead-Based Paint

- Ceiling - potential LBP
- Floors, doors, cables, miscellaneous equipment

2.2.1.3 Non-PCB Based Petroleum

- 1 - 5 gallon oil can

2.2.1.4 PCB-Containing Equipment

No known PCB-containing equipment was identified at this facility.

2.2.1.5 Other Materials

- 60 - lead-acid batteries
- 2 - electric heaters
- 1 - Mercury-containing temperature gauge
- 1 - dry-type transformer, GE 9T21B9109
- 1 - disconnect switch
- 1 - gallon insulator scrub
- 2 - battery chargers
- 2 - fire extinguishers
- 7 - 4-foot fluorescent light fixture with ballast
- 5 - trolley breakers, construction post 1980

2.2.1.6 EDR File Review

Listings for the target property:

The facility is listed as 12th and Filbert Streets. Based on this designation Reading Terminal was listed as the Target Property. Reading Terminal is listed in the Superfund Enterprise Management System (SEMS) –Archive. A preliminary assessment was completed in 1993 for inclusion to the National Priority List (NPL) registry. Upon evaluation the site did not meet the criteria for NPL.

SEPTA is listed in the following databases for the target property and immediate vicinity:

- Reading Stat 1 North 12th Street, listed on FINDS database, database tracking, no relevant impact.
- Reading Termi 12th and Market Street, listed on FTTS, violation for PCB Disposal 1985, no issue. Also listed on ICIS, FINDS, and ERNS databases with database tracking and no relevant impact.
- Reading Stat 12th and Market Sts, listed on ECHO, database tracking, no relevant impact.
- Reading Stat 12th and Market Sts, listed on ERNS, soil contamination due to transformer equipment failure August 2010 Market East and Suburban Station, release on tracks, PCB 580 gallons, confirm with SEPTA that not an issue for site redevelopment.

Listings for adjacent properties:

HDR evaluated sites located within ¼ mile of the target property. The following sites were evaluated:

- PA Convention Center (12th and Arch Streets). The PA Convention Center was listed as a Conditionally Exempt Small Quantity Generator (CESQG). No violations were identified. This facility is not an environmental concern for redevelopment.
- PA Convention Center is listed in the NY Manifest database. This listing does not impact redevelopment of the 12th street facility.
- Citibank (13th and Arch) was listed in the PA Manifest database. This listing does not impact redevelopment of the 12th street facility.
- Criminal Justice Center (1301 Filbert Street) was listed in the PA UST database. This facility has a 2,500-gallon Diesel Fuel tank currently in use with up to date inspections. This listing does not impact redevelopment of the 12th street facility.
- Philadelphia Marriot Hotel (1201 Market Street). The Marriot Hotel is listed as a Small Quantity Generator (SQG). No violations were identified. This listing does not impact redevelopment of the 12th street facility.
- Market Street Laundry (1306 Filbert Street) was listed on the EDR Historical Cleaner database. It was in service in 1920. This listing does not impact redevelopment of the 12th street facility.
- 13 S 12th Street is listed in the EDR Historical Cleaners database as Whitman Cleaners. This listing does not impact redevelopment of the 12th street facility.
- Philadelphia. Water Dept. – Bloomfield C/3A at One Reading Center-1101 Market Street is listed on the PA Historical LF database. This listing does not impact redevelopment of the 12th street facility.
- 1234 Market Street is listed on the PA AST, ICIS, FINDS, ECHO, FTTS, HIST FTTS, US AIRS databases. HDR does not consider this listing relevant to property redevelopment due to the distance from the project for redevelopment.
- Basement area between Girard Bldg. and Market St. Bldg. (21 South 12th Street) is listed as having a PCB Transformer. HDR does not consider this listing relevant to property redevelopment due to the distance from project redevelopment.

None of these sites are anticipated to impact site redevelopment.

2.2.1.7 Testing Requirements

- Asbestos wipe sampling and testing to verify the presence of the observed suspected asbestos and allow for quantification of the asbestos remediation effort; and
- In-situ testing of areas of suspected lead-based paint (requiring encapsulation) and to determine if peeling paint is lead-based (requiring removal - not suitable for encapsulation); conduct a field survey using X-Ray Fluorescence (XRF) technology.

2.2.2 18th Street

This section refers to pictures 119 through 132 in the photo log provided in Appendix 3.2.2.

2.2.2.1 Suspect Asbestos

- 18 - 2' x 4' x ¼" transite board covering each switch
- 7 - 1.5' x 5' x ½" headboards – switches
- 1 - 1.5' x 5' x ½" sideboard – switches
- 9 - 4' x 5' x ½" doors – switches
- 2 - 3' x 4' x ½" panels
- 64 - 4' x 4' ceiling tiles at platform/track area

2.2.2.2 Lead-Based Paint

- 9 - motor operators – metal boxes (possible LBP)

2.2.2.3 Non-PCB Based Petroleum

- 2 - 5-gallon oil cans
- Observation of stained soil near rail with sand

2.2.2.4 PCB-Containing Equipment

No known PCB-containing equipment was identified at this facility.

2.2.2.5 Other Materials

- 60 - lead-acid batteries
- 2 - battery chargers
- 1 - fire extinguisher
- 1 - 4 foot fluorescent light fixture with ballast
- 2 - inactive battery chargers
- 2 - fire doors, wood with metal coating

2.2.2.6 EDR File Review

Listings for the target property:

The facility is listed as 18th Street and John F Kennedy Blvd. Based on this designation Youngs Custom Tailor & Cleaners was the closest property listed at 1801 JFK Boulevard. It is listed on the EDR Historical Cleaner database with no violations identified. It is not anticipated there will be any soil removal therefore this listing does not impact redevelopment of the 18th Street facility.

SEPTA is not listed in any of the database information for 18th Street.

Listings for adjacent properties:

HDR evaluated sites located within 1/16 mile of the target property. Several sites, grouped in two clusters (A and B) in the EDR database search report, were identified.

Cluster A included the following sites:

- FMC Corporation (1735 Market Street) is listed on the FTTS, HIST FTTS, ICIS, FINDS, ECHO, and TCSA databases.
- Various divisions of SUNOCO (1735 Market Street) is listed in the TSCA, FINDS, PA AIRS, FUELS PROGRAM, CT MANIFEST,
- 1735 Market Street is listed in the EDR Hist Auto database.
- Nine Penn Ctr Assoc. (1735 Market Street) is listed on the PA ARCHIVE AST database as having a 275 gal Diesel tank.
- Philadelphia Energy Solutions Refining and Marketing, LLC (1735 Market Street) is listed on the FUELS PROGRAM database.
- Ten Penn Ctr Assoc. (1801 Market Street) is listed on the PA AST database as having a 4,000-gal Diesel Fuel AST in use. No violations are reported.

- Two Logan Square (18th and Arch Streets) is listed on the PA ARCHIVE data base as having a 275-gal. diesel tank. No violations are reported.

These facilities all used similar chemicals to SEPTA including petroleum and PCBs. HDR cannot rule out impact on soil. If soils are to be excavated or managed on the property then further investigation is warranted.

Cluster B included the following sites:

- 1801 Market Street is listed on the EDR Hist Auto database. No violations are reported.
- Sun Refining & Marketing Co. (1801 Market Street) is listed in ICIS, FINDS, CT MANIFEST databases. No violations are reported.
- Ten Penn Center Assoc. (1801 Market Street) is listed in the PA AST as having a 4,000-gal. Diesel Fuel tank currently in use. No violations are reported.

It is considered unlikely that B Cluster sites would impact site redevelopment.

2.2.2.7 Testing Requirements

- Asbestos sampling and testing to verify the presence of the observed suspected asbestos and allow for quantification of the asbestos remediation effort; and
- Testing of the oil-soaked soil and below crushed stone for PCBs (EPA method 8081), total petroleum hydrocarbons (EPA method 8021B), and metals (TAL metals EPA method 6000 7000 series).

2.2.3 Portal

This section refers to pictures 133 through 137 in the photo log provided in Appendix 3.2.3.

2.2.3.1 Suspect Asbestos

- Potential ACM in tar coated roofing material.

2.2.3.2 Lead-Based Paint

- Possible LBP in control room. Deteriorated peeling yellow paint. Due to the condition of the paint it is unlikely encapsulation will be possible without prior removal of loose lead-based paint.

2.2.3.3 Non-PCB Based Petroleum

- Oil staining in crushed stone.

2.2.3.4 PCB-Containing Equipment

- No known PCB-containing equipment was identified at this facility.

2.2.3.5 Other Materials

- 60 - lead-acid batteries
- 1 - waste can
- 1 - electric heater
- 5 - 4-foot fluorescent light fixture with ballast
- 1 - dry type transformer
- 1 - disconnect switch

- 1 - fire extinguisher
- 5 - trolley breakers, empty

2.2.3.6 EDR File Review

Listings for the target property:

Target property is listed as Rexford RW Co, Inc. at 9th & Spring Garden Streets. It is listed on the RCRA NonGen/NLR, NY MANIFEST, ECHO and FINDS databases. It is listed as a Small Quantity Generator (SQG) with no violations reported. This listing does not impact the redevelopment of the Portal facility.

Listings for adjacent properties:

HDR evaluated sites located within 1/8 mile of the target property.

- Furlong Bella (551 N 10th Street) is listed on the EDR Hist Cleaner list as New York Hand Laundry in 1920. This listing does not impact the redevelopment of the Portal facility.
- NE Corner of 10th & Green Streets (1006-1020 Mt. Vernon/NE Corner 10th & Green) is listed in the PA AUL and PA VCP databases. There are no violations reported. This listing does not impact the redevelopment of the Portal facility.
- 919 Wallace St is listed on the PA VCP database. There are no violations reported. This listing does not impact the redevelopment of the Portal facility.
- Simpson Midtown (1003-1005 Green St.) is listed on the PA VCP database. There are no violations reported. This listing is not considered to impact the redevelopment of the Portal facility.

None of these sites are anticipated to impact site redevelopment.

2.2.3.7 Testing Requirements

- Asbestos sampling and testing to verify the presence of the observed suspected asbestos and allow for quantification of the asbestos remediation effort;
- In-situ testing of areas of suspected lead-based paint (requiring encapsulation) and to determine if peeling paint is lead-based (requiring removal - not suitable for encapsulation); conduct a field survey using X-Ray Fluorescence (XRF) technology; and
- Testing of the oil-soaked crushed stone for PCBs (EPA method 8081), total petroleum hydrocarbons (EPA method 8021B), and metals (TAL metals EPA method 6000 7000 series).

2.3 DC TRACTION POWER SUBSTATIONS

2.3.1 Market Street

This section refers to pictures 138 through 153 in the photo log provided in Appendix 3.3.1.

2.3.1.1 Suspect Asbestos

- 3 - rectifier panels 2' x 2'
- 3 - panel 2' x 3'x1'
- 18 - switchgear panels 10' x 2.5'
- 16 - switchgear panels 1.5' x 2' x 3"
- 21 - arc chutes each

2.3.1.2 Lead-Based Paint

- Walls, floors, doors, windows, grates, cables miscellaneous equipment – possible LBP

2.3.1.3 Non-PCB Based Petroleum

- 3 - rectifier transformers, English Electric Hewittic Rectifiers, serial numbers 44909, 44910, 44911, type S22GN302-U1119, order #SRT-5470, type2P3B-15

2.3.1.4 PCB-Containing Equipment

- 3 - rectifier transformers, 1971 manufacture, Hackbridge & Hewittic Elec Co – Great Britain, serial numbers 221591, 221590 and 221587, 757 gallons each, total weight with oil 10,100 lbs for each unit.

2.3.1.5 Other Materials

- 60 - lead-acid batteries
- Flooring - ref fiberglass, 6 years old, GP03
- Sump pump - water showing no sheen
- No known spills or releases - berm in place at 33 years
- 4 - Carrier air handlers serial number 0A6813-01-1111 (same on all) model 27CC-300D
- 1 - possible UST, filled with water 15 years ago
- 4 - transformers; 19152, 71L1058, 71L1057, and 71J9005, unknown if they contain PCBs, capacity is unknown for each of these transformers

2.3.1.6 EDR File Review

The SEPTA Powelton Avenue Rail Road Yard is adjacent to the facility and listed within the ICIS US AIRS FINDS and ECHO databases. Minor environmental compliance penalties were noted for administrative requirements for air monitoring. These listings are not anticipated to impact the redevelopment of the Market Street Substation.

Several facilities within 1/8 mile of the target property were evaluated by HDR to determine if they would have impact to the target property.

- Drexel University is listed in the ICIS, US AIRS, FINDS, and ECHO databases. This listing is for minor enforcement action regarding their air emissions. Drexel University is also listed within the PA RGA LUST, and PA UNREG LTANKS databases.
- Hagerty Library (3300 Market St) is listed on the PA AARCHIVE AST database. There are currently two 275 gal ASTs in use. No violations are reported.
- Sherman Harry (3233 Market St) is listed on the EDR Hist Auto database as being an automobile repairing location in 1930.
- GEN SVCS BLDG (3330 Market St) is listed on the PA RGA LUST and PA LUST databases. There is a 1000 gal ULGAS UST currently in use and no violations reported.
- Lancaster Ave Armory (3205 Lancaster Ave) is listed in the RCRA-CESQG, FINDS, and ECHO databases as a Conditionally Exempt Small Quantity Generator. There are no violations reported.
- Sony Pictures Entertainment SPE (3205-51 Lancaster Avenue) is listed on the PA MANIFEST. There are no violations reported.
- Firestone Master Care Center is located at 32nd and Market Streets in the PA LUST database.
- University City Science Center (34th and Market) is listed in the FINDS, ECHO RCRA-SQG, and PA MANIFEST databases as a Small Quantity Generator. There are no violations reported.

- Arcadia Laundry Co (3422 Market St.) is listed on the EDR Hist Cleaner database.

None of these sites are anticipated to impact site redevelopment.

2.3.1.7 Testing Requirements

- Asbestos sampling and testing to verify the presence of the observed suspected asbestos and allow for quantification of the asbestos remediation effort;
- In-situ testing of areas of suspected lead-based paint (requiring encapsulation) and to determine if peeling paint is lead-based (requiring removal - not suitable for encapsulation); conduct a field survey using X-Ray Fluorescence (XRF) technology;
- Testing of the PCB-oil containing equipment for PCBs (EPA method 8081), total halogenated compounds (EPA method 8021B), and metals (TAL metals EPA method 6000 7000 series); and
- Sampling is needed to determine if 10C oil, PCB oil, or other is present in transformers with unknown content.

2.3.2 Ranstead

This section refers to pictures 154 through 177 in the photo log provided in Appendix 3.3.2.

2.3.2.1 Suspect Asbestos

- 10 - circuit breaker panels, 4' x 2.5'
- 10 - relay boards (Varied size)
- 1 - ground test device
- 2 - rectifiers (Micarta possible inside)
- 1 - access to PECO building 8' x 4'

2.3.2.2 Lead-Based Paint

- Possible lead-based paint on several items, based upon age of the structure: Columns – pre 1970
- Floor/steps 1972
- Windows
- Grates
- Cables
- Miscellaneous equipment

2.3.2.3 Non-PCB Based Petroleum

- 2 - switchgear, oil-filled breaker, Roller-Smith serial No. 37350DI(or 1) and 37350EI(or 1)

2.3.2.4 PCB-Containing Equipment

- 2 - rectifier transformers, 1972, Fuji Electric Co. Ltd. serial number AC69267T2-2 and AC69267T2-1, 915 gallons oil each, weight of transformer plus oil: 31,000 lbs. each
- Potential transformers, 1 gallon oil-filled
- 1 - transformer serial number 2186-1, 515 gallons

2.3.2.5 Other Materials

- 60 - lead-acid batteries
- 1 - flooring red fiberglass, 6 years old, GP03
- 1 - oil waste separator
- 2 - fans/blowers serial No. U721-521 Model 330 SF1 &2
- No known spill or releases (berm in place) around transformers - 33 years
- 2 - transformers serial numbers 728003540 and 19P826H01, unknown PCB content, capacity unknown for each
- 2 - transformers unknown serial numbers, unknown PCB content, capacity unknown for each

2.3.2.6 EDR File Review

Target property is listed as Ranstead Substation at 2034 Ranstead St., Philadelphia. It is listed on the PCB TRANSFORMERS database as having 3 transformers with no violations reported.

Several sites are listed in the EDR databases in the vicinity of the Ranstead Substation. HDR evaluated sites located within 1/8 mile of the target property. Due to the regulatory status, the distance of the individual sites from the substation, and/or the type of database identified are not considered an environmental concern for the site redevelopment.

2.3.2.7 Testing Requirements

- Asbestos sampling and testing to verify the presence of the observed suspected asbestos and allow for quantification of the asbestos remediation effort;
- In-situ testing of areas of suspected lead-based paint (requiring encapsulation) and to determine if peeling paint is lead-based (requiring removal - not suitable for encapsulation); conduct a field survey using X-Ray Fluorescence (XRF) technology; and,
- Testing of the PCB-oil containing equipment for PCBs (EPA method 8081), total halogenated compounds (EPA method 8021B), and metals (TAL metals EPA method 6000 7000 series).

2.3.3 Ellen

This section refers to pictures 178 through 191 in the photo log provided in Appendix 3.3.3.

2.3.3.1 Suspect Asbestos

- 5 - DC switchgear panels 6' x 3'
- 5 - GE JRDC circuit breaker (backs) 3' x 2' x 6"
- 2 - rectifiers arc chutes
- 4 - panels 10' x 10' panels (feeding room)

2.3.3.2 Lead-Based Paint

- Floors- possible LBP

2.3.3.3 Non-PCB Based Petroleum

- 6 - oil containers 3 gallons

2.3.3.4 PCB-Containing Equipment

- 2 - rectifier transformers, Westinghouse serial No. C4735-1 and C4735-2, 1,218 gallon tanks each, total weight with oil 40,469 lbs. each
- 2 - transformers, Westinghouse serial No. SBV4069-01 and SBV4070-1, 224 gallon tanks each, total weight 7,046 lbs. each

2.3.3.5 Other Materials

- 60 - lead-acid batteries
- 3 - boxes lights
- 2 - transformers serial numbers 75H34 23 and 75H34 24, unknown PCB content, capacity of each is unknown

2.3.3.6 EDR File Review

Listings for the target property:

Target property is listed as Ellen Substation, Front & Ellen Streets, Philadelphia, PA is listed on the PCB TRANSFORMERS database. There are 4 transformers on the property.

Listings for adjacent properties:

HDR evaluated sites located within ¼ mile of the target property.

- Maconghy Chester (341 New Market St) is listed in the EDR Hist Auto database.
- Roseman & CO/E (829 N Second) is listed in the RCRA NonGen/NLR, FINDS and ECHO databases. No violations are reported.
- Tracker John (911 N 2D) is listed in the EDR Hist Auto database. Noted as an automobile repair in 1925
- 801 805 N 2nd Street is listed in the PA LUST and PA ARCHIVE LUST. Cleanup was completed on 01/24/2014 from a UST containing petroleum.
- Fong Charlie (155 Brown Street) is listed on the EDR Hist Cleaner. It was a Chinese laundry in 1925.
- Exxon RS 2 4565 (141 E Brown Street) is listed on the PA RGA LUST database. There is no other data listed.

None of these sites are anticipated to impact site redevelopment.

2.3.3.7 Testing Requirements

- Asbestos sampling and testing to verify the presence of the observed suspected asbestos and allow for quantification of the asbestos remediation effort;
- Testing of the PCB-oil containing equipment for PCBs (EPA method 8081), total halogenated compounds (EPA method 8021B), and metals (TAL metals EPA method 6000 7000 series); and
- Sampling is needed to determine if 10C oil, PCB oil, or other is present in transformers with unknown content.

2.3.4 Broad Street

This section refers to pictures 192 through 232 in the photo log provided in Appendix 3.3.4.

2.3.4.1 Suspect Asbestos

- Roofing for the facility is being replaced under independent SEPTA contract. Asbestos roofing material will be covered under that contract.
- Based on information provided by SEPTA personnel, it is not anticipated that the duct work has asbestos insulated panels.
- 5 - fire doors may be constructed with asbestos insulation.
- 12 - 12'X1'X1" potential transite divider boards.
- 12 - 12'x2'X1" transite ceiling divider boards.
- 1 - 2'X1.5'X3' transite backboard (Micarta Board)
- Pipe wrapping in the generator room
- EL shaped wall on the first floor, possible asbestos
- Control board & wiring 7'x4'x1/2"
- 14 - DC circuit breakers-transite board 2'x3'x3'
- Lead Sheath Cable-asbestos wrapped
- 7 - Ebony board w/lead cables 3'x4'x1.5"
- 1 - Diesel generator output panel-Ebony board 6'x5'x4"
- 8 - Resistor Banks
- Small transformer-potential LBP
- 2 - ABS boxes with transite board

2.3.4.2 Lead-Based Paint

- Due to the age of the building it is anticipated that the floor paint contains lead-based paint.
- Several walls are anticipated to be demolished during redevelopment of the property. These walls are made of brick, cinderblock, or glazed brick. Walls containing glazed brick may contain elevated lead and should be managed appropriately prior to redevelopment
- 1 - AST w/mop bucket
- 8 - Oil switch Rectifiers-potential LBP
- 1 - Small transformer-potential LBP

2.3.4.3 Non-PCB Based Petroleum

- Two tanks exist at the facility. The first tank is approximately 10,000 gallons and has been abandoned in place. The tank access port is beneath the floor of the building and surrounded by a cinderblock wall in the basement of the facility. The tank is surrounded by sand and based on SEPTA personnel was closed over ten years ago and was reportedly backfilled with sand. No closure documents were identified. The second tank is a diesel tank holding 2,200 gallons.
- 1 - Pothead filled with oil 5 gallons.
- Ferranti Packard LMTD transformer Serial Number 305714, containing 279 gallons of Askarel Oil. Total weight 11,700lbs.
- Breaker GEI-9352, 6155769-G1, filled with oil

2.3.4.4 PCB-Containing Equipment

- Brown Boveri Corporation PCB Transformer Serial numbers is 2-305820 and 2-305819, containing 654 gallons of Askarel oil each. Transformer is dated 1977. Totaling 24,500lbs.

Note that at least two of the former PCB transformers have been SEPTA "System 50" rinsed and may contain tetrachloroethylene (PCE) or mixtures of PCE and PCB oil. These transformers will require sampling to determine the exact nature of their contents for proper disposal.

2.3.4.5 Other Materials

- At least one dozen fluorescent light tubes
- Porcelain insulators and brick, concrete or cinderblock may contain elevated levels of NORM
- 3 - transformers serial numbers 9100-1, 228001 167, and 227001 202, PCBs unknown, capacity for each is unknown.
- 60 - lead acid batteries
- 1 - 5 gal diesel can

2.3.4.6 EDR File Review

Listings for the target property:

Target property is listed as 1327 Mount Vernon Street. Based on this designation Broad Substation was listed as a Target Property. SEPTA is listed in the following databases for the target property and immediate vicinity:

FINDING	DATABASE	COMMENT
BROAD STREET SUBSTATION	PA AST	Listed PA Above Ground Storage Tank
BROAD STREET SUBSTATION	PCB Transformers	Facility contains two PCB Transformers

SEPTA provided the following information for the Broad Street Substation:

Transformer Serial Number	Station No.	Location	Address	Power Rating (kVA)	Dry Type	Liquid Cooled	Capacity
2-305820	28	Broad	1327 Mount Vernon Street	3250	NO	PCB	654
2-305819	28	Broad	1327 Mount Vernon Street	3250	NO	PCB	654
305714	28	Broad	1327 Mount Vernon Street	2000	NO	NON-PCB	279
9100-1	28	Broad	1327 Mount Vernon Street	167	YES	-	-
228001 167	28	Broad	1327 Mount Vernon Street	112.5	YES	-	-
227001 202	28	Broad	1327 Mount Vernon Street	112.5	YES	-	-

Listings for adjacent properties:

HDR evaluated sites located within 1/16 mile of the target property. The following sites were evaluated:

- Davis Geo E. 1328 Mt. Vernon Street;
- Gray HC Co. 1323 Mt. Vernon Street;
- Davis Geo E 1323 Mt. Vernon Street; and
- 1335 Mount Vernon Street.

Each of these facilities was listed as a Historical Auto Shop. Historic Auto Shops could have included underground storage tanks and historic spills or releases. The proximity of these facilities to the substation is cause for concern and may require sampling.

It should be noted that the Broad Street station will likely require tank closure with PADEP and sampling of PCB transformers. Further information on the anticipated waste streams will be provided in the 50% design.

2.3.4.7 Testing Requirements

- Asbestos sampling and testing to verify the presence of the observed suspected asbestos and allow for quantification of the asbestos remediation effort;
- In-situ testing of areas of suspected lead-based paint (requiring encapsulation) and to determine if peeling paint is lead-based (requiring removal - not suitable for encapsulation); conduct a field survey using X-Ray Fluorescence (XRF) technology;
- Testing of the PCB-oil containing equipment for PCBs (EPA method 8081), total halogenated compounds (EPA method 8021B), and metals (TAL metals EPA method 6000 7000 series);
- Sampling is needed to determine if 10C oil, PCB oil, or other is present in transformers with unknown content; and
- Abandoned tank removal and closure required.

2.3.5 Park

This section refers to pictures 233 through 250 in the photo log provided in Appendix 3.3.5.

2.3.5.1 Suspect Asbestos

- 2 - ATS transite boards
- 6 - ebony boards 2' x 3' x 3"
- 1 - track panel 4' x 5' x 1"
- 5 - ebony boards 4' x 2' x 2"
- 5 - transite boards 2' x 3' x 1/2"
- 2 - ebony boards 3' x 3' x 2"
- 1 - ground test device and wiring
- 22 - insulators/basement and ceiling
- 2 - transite panels 5' 3'
- 2 - fire doors
- 4 - divider panels 8' x 2' x 2"
- 2 - pipe wrap 12' x 6"
- 14 - DC feeders (transite) w/transite board

2.3.5.2 Lead-Based Paint

- Floor- possible LBP

2.3.5.3 Non-PCB Based Petroleum

- 2 - switches, 25 gallons each oil filled
- 2 - breakers, 25 gallons each oil filled

2.3.5.4 PCB Containing Equipment

- 2 - rectifier transformers, 1977 ABB, serial numbers 2-305822 and 2-305818, 654 gallons each, total weight oil and tank is 24,000 lbs. each.

2.3.5.5 Other Materials

- 60 - lead-acid batteries
- 3 - transformers serial numbers 21709, 14838-1, and 228001157, PCBs unknown, capacity for each is unknown.

2.3.5.6 EDR File Review

Listings for the target property:

Target property is listed as Park Substation at 2440 N. Park Ave. Philadelphia, PA. It is listed on the PCB TRANSFORMER database as having two transformers on the property. There are no violations reported.

Listings for adjacent properties:

HDR evaluated sites located within ¼ mile of the target property.

- Charles Wacker Corp. (1302 W Cumberland St.) is listed in the RCRA-CESQG, FINDS, ECHO databases and is listed as an EDR Hist Auto. It is a Conditionally Exempt Small Quantity Generator and there are no violations reported. This listing does not impact redevelopment of the Park facility.
- Fielding Reilly (2421 N Broad St) is listed in the EDR Hist Auto database. This listing does not impact redevelopment of the Park facility.
- Parking Son (2417 N Broad St) is listed on the EDR Hist Auto databases as an automobile repair shop in 1920. This listing does not impact redevelopment of the Park facility.
- Engle Auto Service Inc. (2415 N Broad St) is listed on the EDR Hist Auto database as an automobile service in 1936. This listing does not impact redevelopment of the Park facility.
- Apex On York (2401 North 13th Street) is listed on the VCP and ACT 2-DEED databases. There are no violations reported. This listing does not impact redevelopment of the Park facility.
- Automobile Life Extension Institute of Philadelphia (2501 N Broad St) is listed on the EDR Hist Auto database as an automobile repairing facility in 1936. This listing does not impact redevelopment of the Park facility.
- Getty 67402 (2401 N Broad St.) is listed on the RGA LUST and LUST UST databases. Cleanup of a UST containing petroleum is shown as completed 08/08/2012. This listing does not impact redevelopment of the Park facility.
- Firth Brothers (1402 Cumberland Dr.) is listed on the EDR Hist Auto database as being an automobile repairing location in 1925. This listing does not impact redevelopment of the Park facility.
- 2454 N Broad St. is listed on the EDR Hist Cleaner database as being Bessies Dry Cleaning. No violations are reported and will not impact redevelopment of Park Substation.
- 2500 N Broad St is listed on the EDR Hist Auto database as Glassmens Auto Glass & Trim Shop. There are no violations and will not impact redevelopment of the Park facility.
- Brock Wm R (2515 N Broad St) is listed on the EDR Hist Auto database as being an automobile repairing location and will not impact redevelopment of the Park facility.
- 2519 N Broad St is listed on the EDR Hist Auto data base as Odells Auto Body shop. This listing will not impact redevelopment of the Park facility.
- Pepper Isidore (1405 W York St) is listed on the EDR Hist Cleaner database as Cleaners Garments Curtains and Draperies in 1930. This listing will not impact redevelopment of the Park facility.

- Bock Wm R (2525 N Broad St) is listed on the EDR Hist Auto database as an automobile repairing facility. This listing will not impact redevelopment of the Park facility.

None of these sites are anticipated to impact site redevelopment

2.3.5.7 Testing Requirements

- Asbestos sampling and testing to verify the presence of the observed suspected asbestos and allow for quantification of the asbestos remediation effort;
- In-situ testing of areas of suspected lead-based paint (requiring encapsulation) and to determine if peeling paint is lead-based (requiring removal - not suitable for encapsulation); conduct a field survey using X-Ray Fluorescence (XRF) technology; and
- Testing of the PCB-oil containing equipment for PCBs (EPA method 8081), total halogenated compounds (EPA method 8021B), and metals (TAL metals EPA method 6000 7000 series).

2.3.6 Loudon

This section refers to pictures 251 through 262 in the photo log provided in Appendix 3.3.6.

2.3.6.1 Suspect Asbestos

- 2 - ATS - transite board
- 2 - ebony board 1.5' x 2' x 1"
- 4 - track panels 1' x 1' x 1"
- 1 - ebony board 1.5' x 4 x 1"
- Insulators
- 5 - Circuit board arc chutes
- 4 - ebony board panels 8' x 4'
- 33 - transformer boards, old transformer bays
- 2 - fire doors
- 16 - divider panels 8' x 2' x 1"
- 1 - asbestos wrapped cables approximately 20'

2.3.6.2 Lead-Based Paint

- Floor
- Telephone cable

2.3.6.3 Non-PCB Based Petroleum

- 1 - Rectifier transformer serial number YBP55721, 325 gallons of oil. Removed from service
- Switches
- Breaker
- Oil filled lines

2.3.6.4 PCB Containing Equipment

- 2 - transformers serial numbers 2-305823 and 2-305821, 654 gallons of oil each. According to the SEPTA list these transformers were removed in 2013.

2.3.6.5 Other Material

- 60 - lead-acid batteries
- 2 - 8' fluorescent light tube
- 2 - transformers serial numbers U8974-1 and U8974-2, PCBs unknown. Capacity of each is unknown. Installed in 2013.
- 3 - transformers serial numbers 72887, 228-001-167, and 227-001-202. PCBs unknown, capacity of each is unknown.

2.3.6.6 EDR File Review

Listings for the target property:

Target property is listed as Loudon Substation, 1401 W. Loudon Street. It is listed on the PCB Transformer database as having 2 transformers.

Listings for adjacent properties:

HDR evaluated several sites located within ¼ mile of the target property.

- Rosenbergs Raphael Sacks (4720 N Broad St) is listed on the ARCHIVE UST database. There was an 8,000-gal. Heating Oil UST located on the property. This listing does not impact redevelopment of the Loudon facility.
- Deliverance Evan Ch (4732 N Broad Street) is listed in the LUST, RGA LUST, UNREG LTANKS, and ARCHIVE UST databases. The facility is inactive according to the LUST database. It has a 6,000-gal. HO tank and a 3,500 gal. HO tank listed both as currently in use according to the ARCHIVE UST.
- Logan I & II (4710 N Broad Street) is listed in the ARCHIVE UST as having an 8,000-gallon Heating Oil UST.
- Rite Aid 3688 (4616-4650 N Broad Street) is listed in the RCRA-CESQG, FINDS and ECHO data bases as Conditionally Exempt Small Quantity Generator.
- 4805 N Broad St is listed in the EDR Hist Auto database. Previously a Transmission Shop. This listing does not impact redevelopment of the Loudon facility.
- 4807 N Broad Street is listed in the EDR Hist Auto database. There are no violations recorded. This listing does not impact redevelopment of the Loudon facility.
- Cooke, Jay JR High (Old York Rd & Loudon St) is listed in the RCRA-CESQG as a Conditionally Exempt Small Quality Generator. Also on ARCHIVE UST, FINDS and ECHO databases. 12,000 gal. heating oil tank listed, not reported. There are no violations recorded. This listing does not impact redevelopment of the Loudon facility.

2.3.6.7 Testing Requirements

- Asbestos sampling and testing to verify the presence of the observed suspected asbestos and allow for quantification of the asbestos remediation effort;
- In-situ testing of areas of suspected lead-based paint (requiring encapsulation) and to determine if peeling paint is lead-based (requiring removal - not suitable for encapsulation); conduct a field survey using X-Ray Fluorescence (XRF) technology; and
- Sampling is needed to determine if 10C oil, PCB oil, or other is present in transformers with unknown content.

2.3.7 Castor

This section refers to pictures 263 through 282 in the photo log provided in Appendix 3.3.7.

2.3.7.1 Suspect Asbestos

- 5 - switchgear arc chutes, 3' x 3'
- Transite case
- Dry transforming wire
- 5 - potential asbestos ceiling tiles 2.5' x 4'
- Rectifier insulators - potential asbestos
- Basement water lines wrapped in asbestos
- 6 - heaters with transite back

2.3.7.2 Lead-Based Paint

- Walls, floors, doors, windows, grates, cables, miscellaneous equipment - possible LBP

2.3.7.3 Non-PCB Based Petroleum

- 2 - breakers oil filled, General Electric G/L Circuit breaker, No. 6178443-G44, type FK-255-250, 16 gallons each, total weight 265lbs
- 1 - transformer serial number 9595930. 840 gallons of 10C insulating oil.

2.3.7.4 PCB Containing Equipment

No known PCB-containing equipment was identified at this facility.

2.3.7.5 Other Materials

- 24 - lead-acid batteries
- 4 - boxes 8' fluorescent tubes
- Floor drains under transformers
- Mercury – reported residual in old transformer pit.
- 1 - transformer serial number 50137. PCBs unknown. Capacity is unknown.
- 1 - compressor

2.3.7.6 EDR File Review

- EZ GAS II (8275 Bustleton Ave) less than 1/8 of a mile away, is listed in the UST database. There are two tanks listed as currently in use. The first one is a gasoline tank holding 15,000 gallons. The second tank is also a gasoline tank, and holds 5,000 gallons. No incidents have been reported.
- TEXACO 100312 Service Station (8275 Bustleton Ave) less than an 1/8 of a mile away, is listed on the LUST, AUL, FINDS, ECHO, RGA LUST, RCRA-SQG, and EDR Hist Auto databases. A release of unleaded gasoline was reported to LUST, impacting surrounding soil, cleanup was reported completed on 03/19/2010. RCRA has this facility classified as a Small Quantity Generator.
- Farrell Elementary (Castor Ave and Fox Chase) less than an 1/8 of a mile away, is listed on UNRED LTANKS and ARCHIVE UST databases. There is one reported tank holding 6,000 gallons of heating oil. No incidents have been reported.

- Philadelphia Gas Works/PGW Castor Sta Transp Dept. (8301 Castor Ave) is less than 1/8 mile away, is listed on the MANIFEST and UST databases. The MANIFEST has three records from this site one totaling 900lbs of material from 4 barrels, kegs, and metal drums. The second, 2,400lbs from 6 barrels, kegs, and metal drums, and the third, 3,100 gallons in tank trucks. The UST has this site listed as currently in use reporting one tank holding 10,000 gallons of gasoline.
- Blatt Tire and Service station (8316 Bustleton Ave) less than 1/8 mile away is listed in the Hist Auto Stations database. No incidents have been reported.
- Aladdin Carpet Cleaning (2167 Benson St) between 1/8 and ¼ mile away, is listed in the Hist Cleaners database. No incidents have been reported.
- Horrocks and Strahle between 1/8 and ¼ mile away, is listed in the ERNS database. One spill has been reported with no other information reported.
- Chris's Auto Repair/Nate and Sons (8140 Bustleton Ave) between 1/8 and ¼ mile away, is listed in the UST, Hist Auto, and RGA LUST databases. There are three tanks listed on UST all of which hold gasoline and are Temporarily Out of Use. No incidents have been reported.

2.3.7.7 Testing Requirements

- Asbestos sampling and testing to verify the presence of the observed suspected asbestos and allow for quantification of the asbestos remediation effort;
- In-situ testing of areas of suspected lead-based paint (requiring encapsulation) and to determine if peeling paint is lead-based (requiring removal - not suitable for encapsulation); conduct a field survey using X-Ray Fluorescence (XRF) technology;
- Testing of the PCB-oil containing equipment for PCBs (EPA method 8081), total halogenated compounds (EPA method 8021B), and metals (TAL metals EPA method 6000 7000 series);
- Sampling and testing of the old transformer pit to confirm presence of mercury; and
- Sampling is needed to determine if 10C oil, PCB oil, or other is present in transformers with unknown content.

3 APPENDICES

3.1 AC TRACTION POWER SUBSTATIONS PHOTOS

3.1.1 Bethayres

BETHAYRES



Photo 1



Photo 2



Photo 3



Photo 4



Photo 5



Photo 6



Photo 7



Photo 8



Photo 9



Photo 10



Photo 11



Photo 12

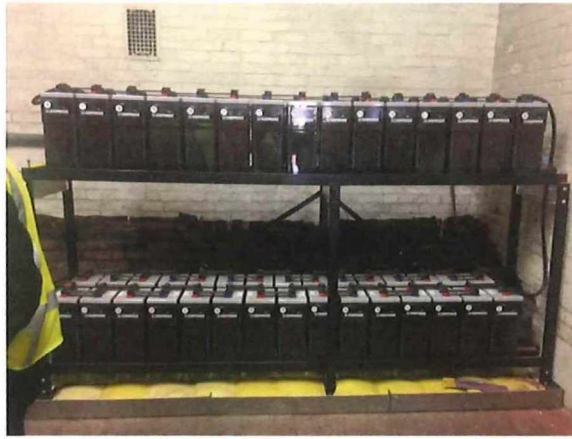


Photo 13



Photo 14



Photo 15

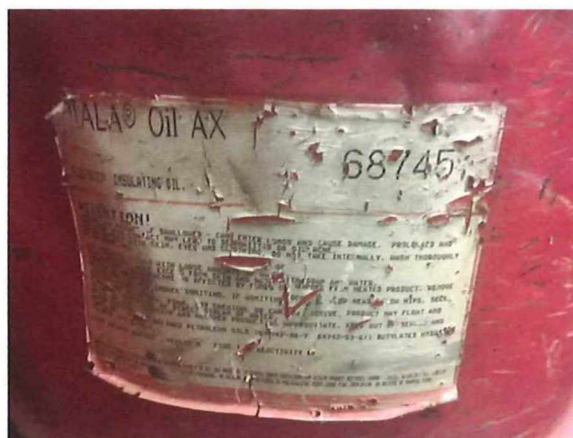


Photo 16

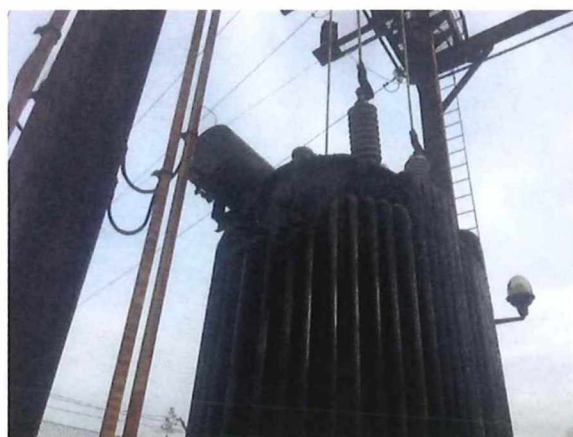


Photo 17



Photo 18

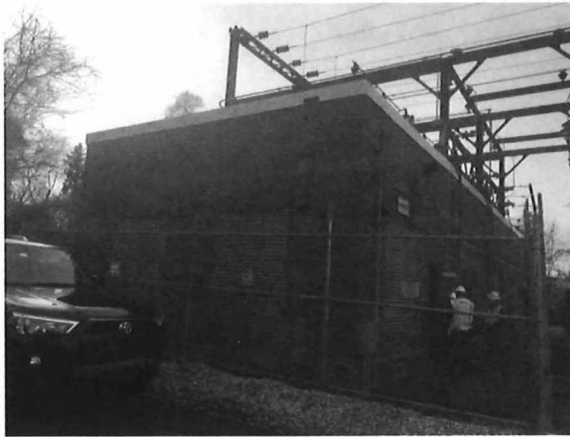


Photo 19

3.1.2 Neshaminy



Photo 20



Photo 21



Photo 22



Photo 23



Photo 24



Photo 25



Photo 26



Photo 27



Photo 28



Photo 29



Photo 30

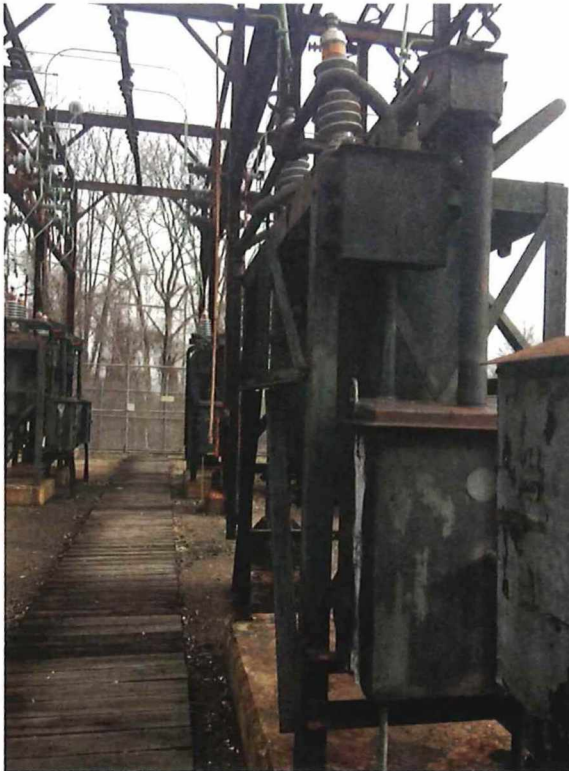


Photo 31



Photo 32



Photo 33



Photo 34

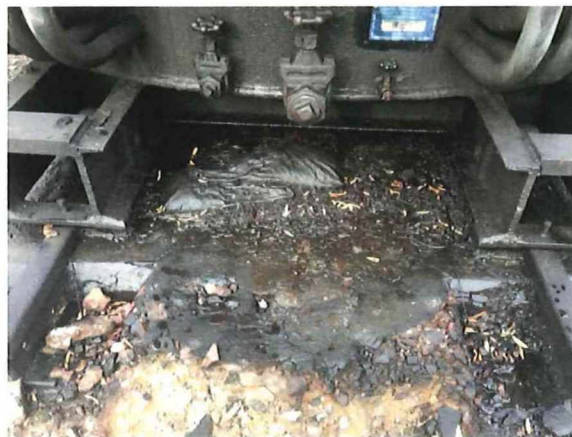


Photo 35

3.1.3 Yardley



Photo 36



Photo 37



Photo 38



Photo 39



Photo 40



Photo 41



Photo 42



Photo 43



Photo 44



Photo 45



Photo 46



Photo 47



Photo 48



Photo 49



Photo 50



Photo 51

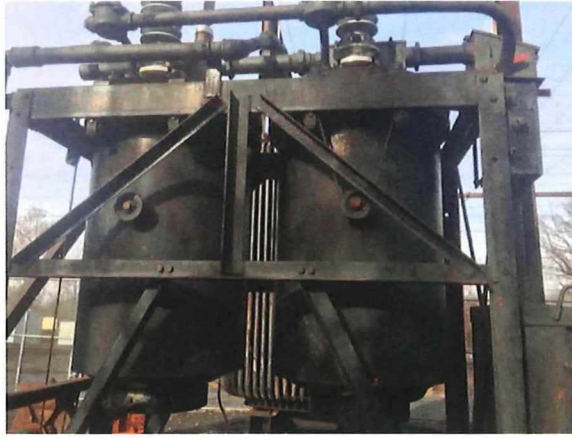


Photo 52



Photo 53



Photo 54



Photo 55



Photo 56



Photo 57



Photo 58



Photo 59

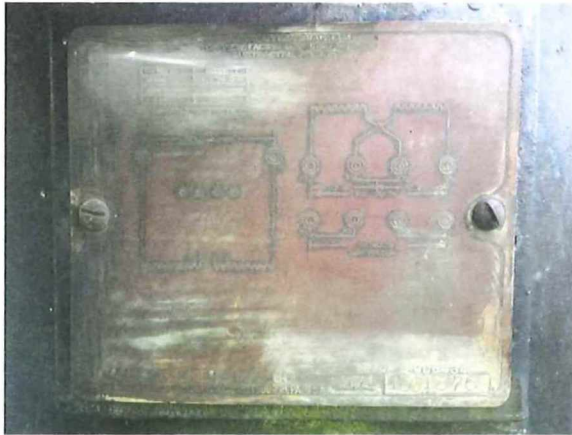


Photo 60



Photo 61



Photo 62



Photo 63



Photo 64

3.1.4 Chestnut Hill East



Photo 65



Photo 66



Photo 67



Photo 68



Photo 69



Photo 70

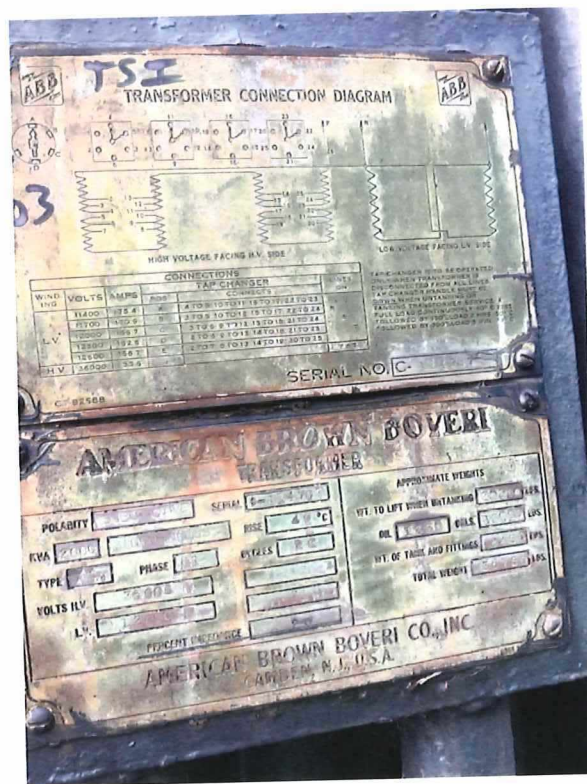


Photo 71



Photo 72



Photo 73



Photo 74



Photo 75



Photo 76



Photo 77



Photo 78

3.1.5 Lansdale



Photo 79



Photo 80



Photo 81

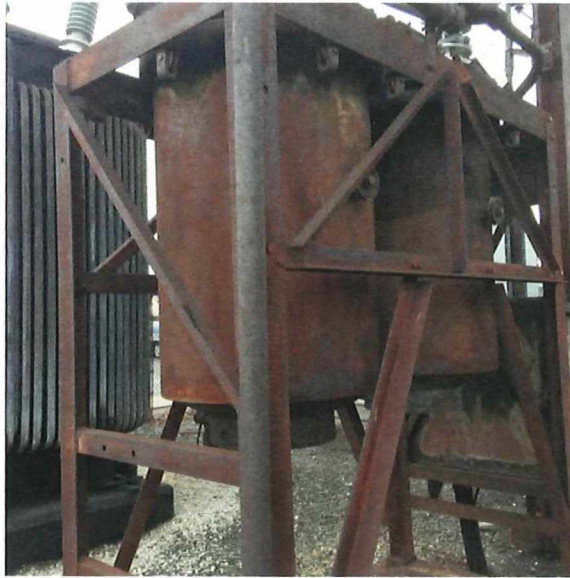


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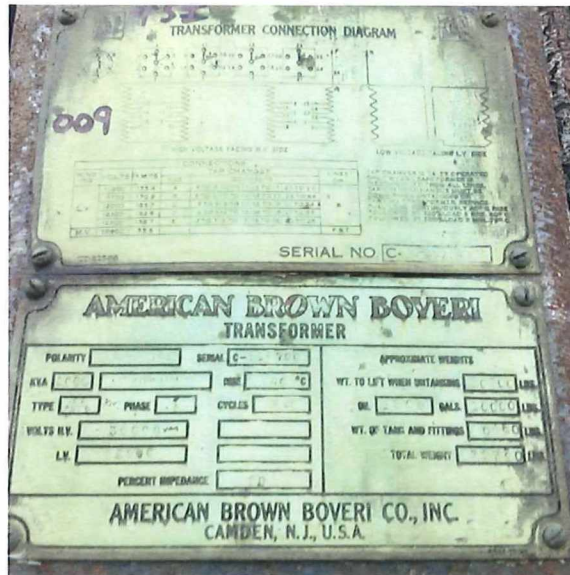


Photo 83



Photo 84

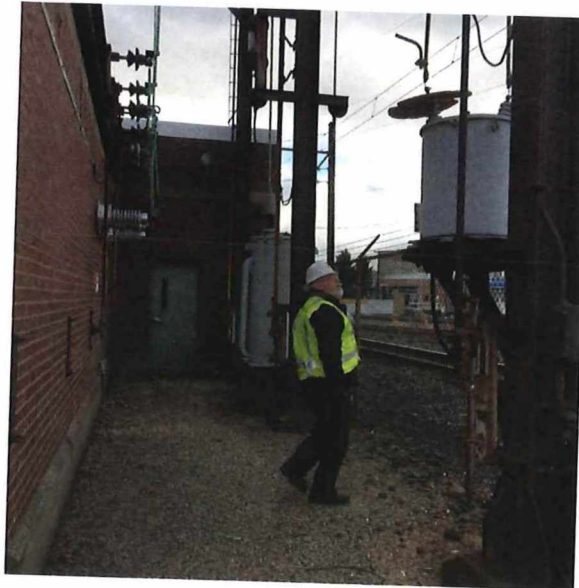


Photo 85



Photo 86



Photo 87



Photo 88

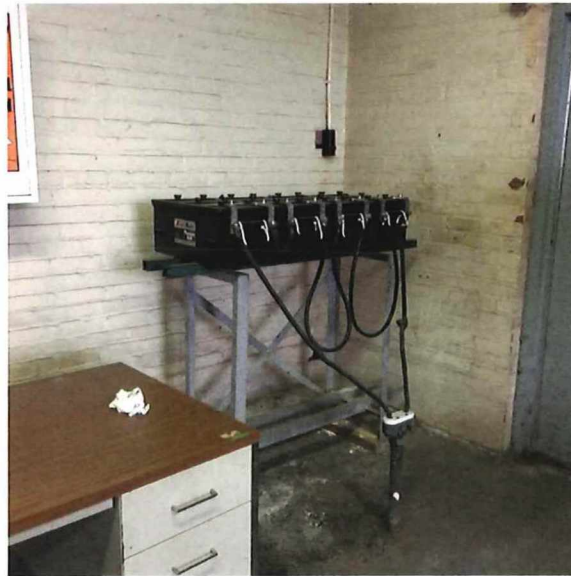


Photo 89



Photo 90

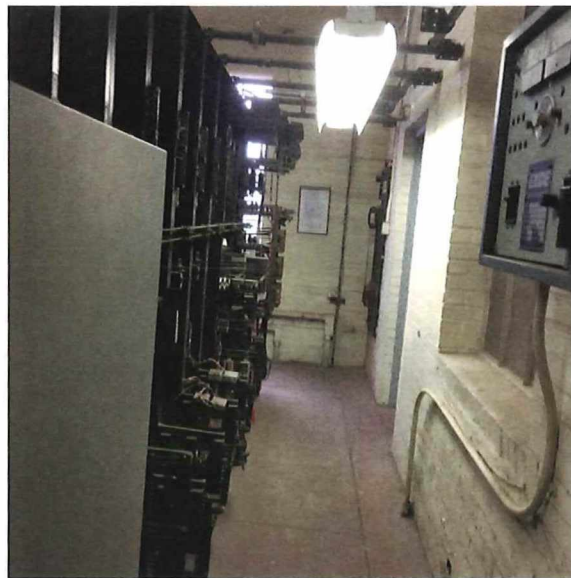


Photo 91

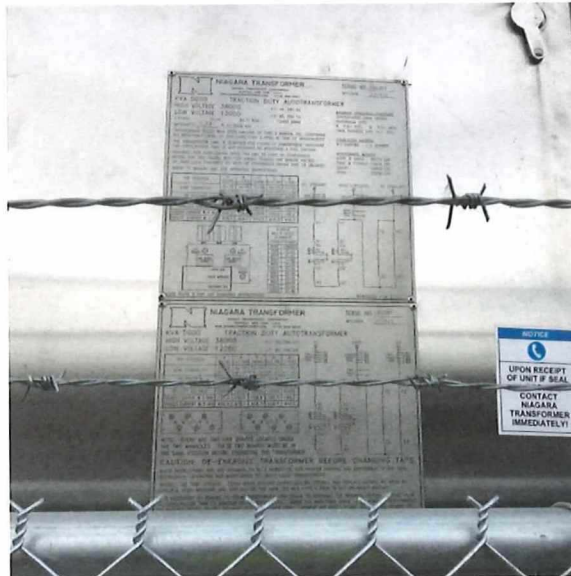


Photo 92



Photo 93



Photo 94

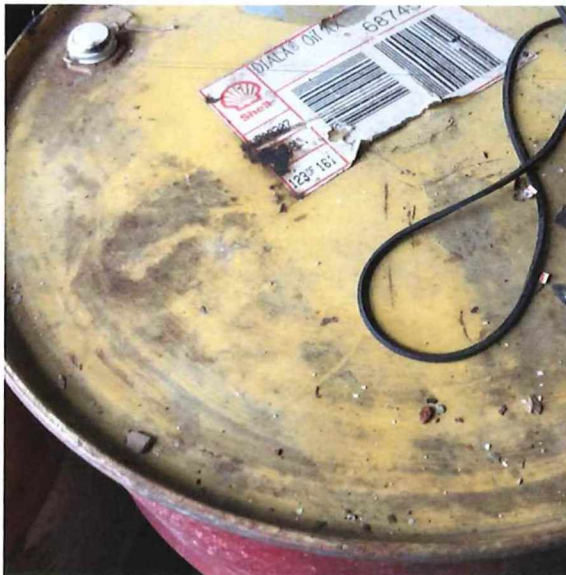


Photo 95

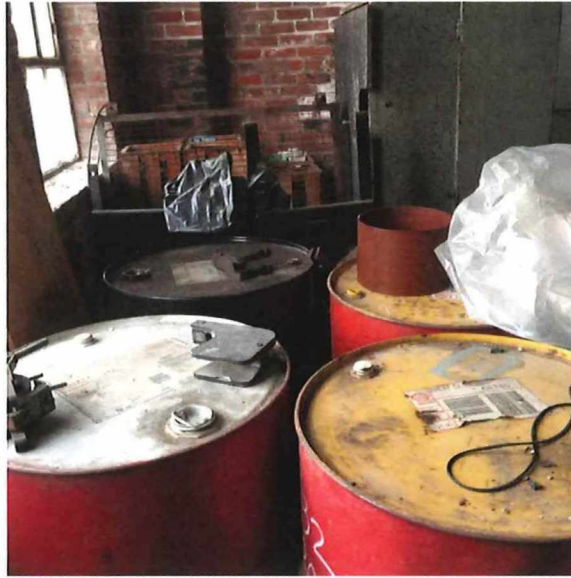


Photo 96



Photo 97



Photo 98

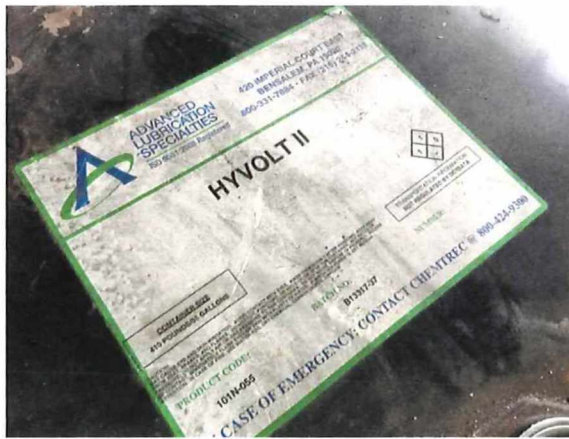


Photo 99

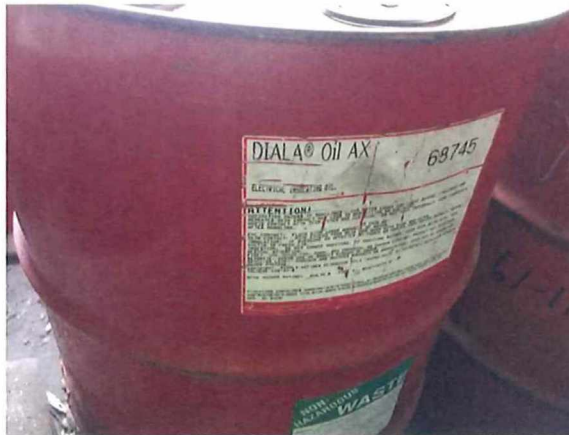


Photo 100



Photo 101



Photo 102

3.1.6 Hatboro



Photo 103



Photo 104



Photo 105



Photo 106

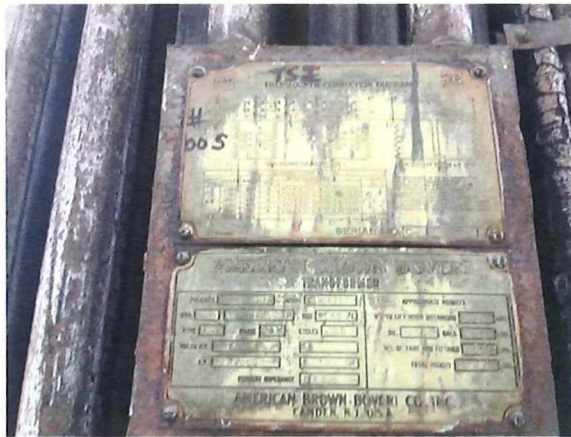


Photo 107



Photo 108

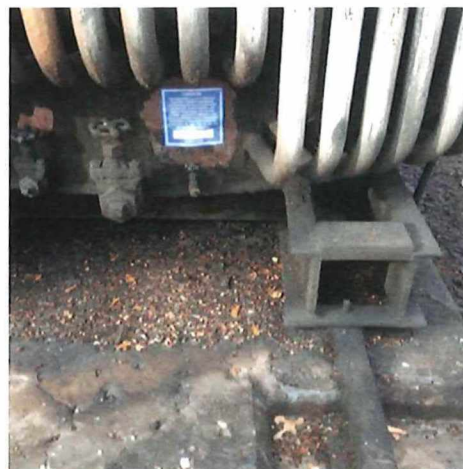


Photo 109

3.2 AC SWITCHING STATIONS PHOTOS

3.2.1 12th Street



Photo 110



Photo 110



Photo 112



Photo 113



Photo 114

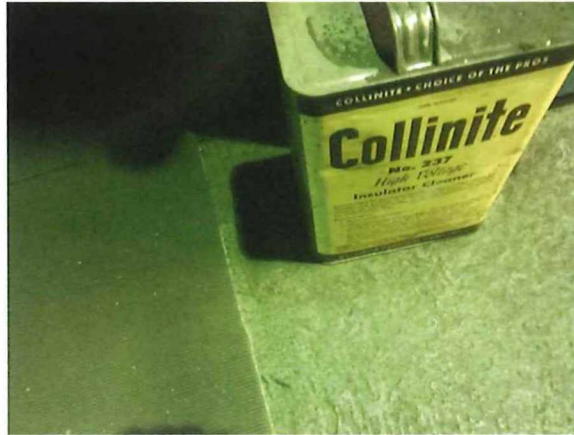


Photo 115



Photo 111



Photo 117

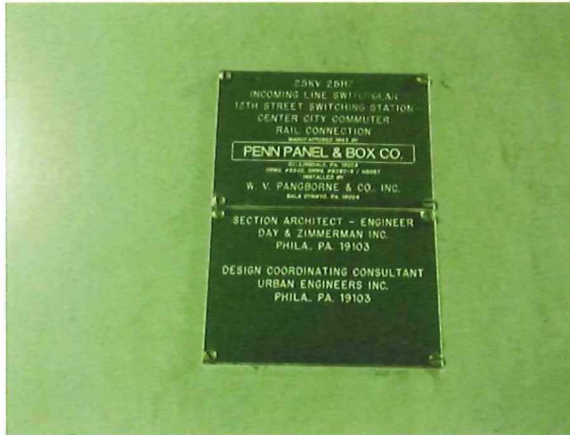


Photo 118

3.2.2 18th Street

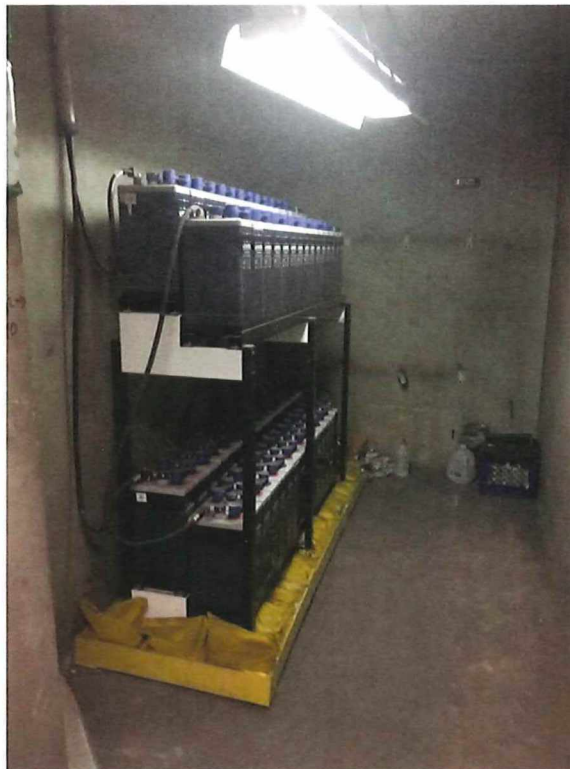


Photo 119



Photo 120



Photo 121



Photo 122



Photo 123



Photo 124



Photo 125



Photo 126



Photo 127



Photo 128



Photo 129



Photo 130



Photo 131



Photo 132

3.2.3 Portal

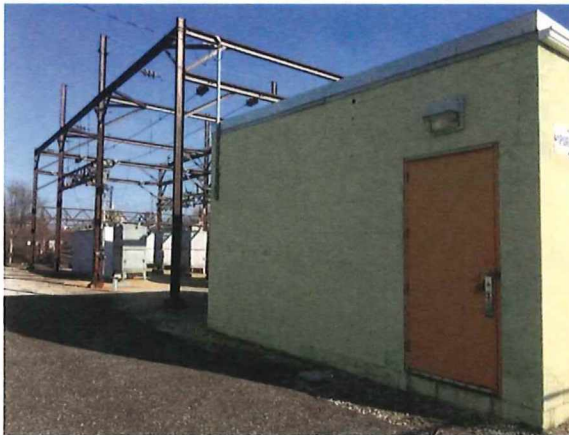


Photo 133

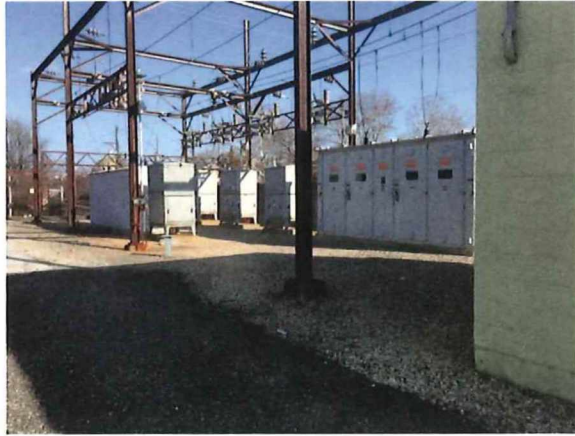


Photo 134



Photo 135



Photo 136



Photo 137

3.3 DC TRACTION POWER SUBSTATIONS PHOTOS

3.3.1 Market Street



Photo 112



Photo 113

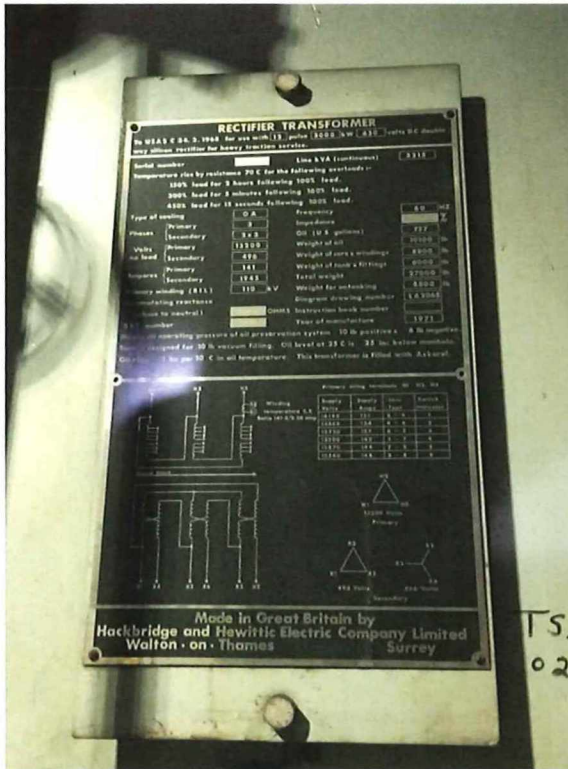


Photo 114



Photo 115

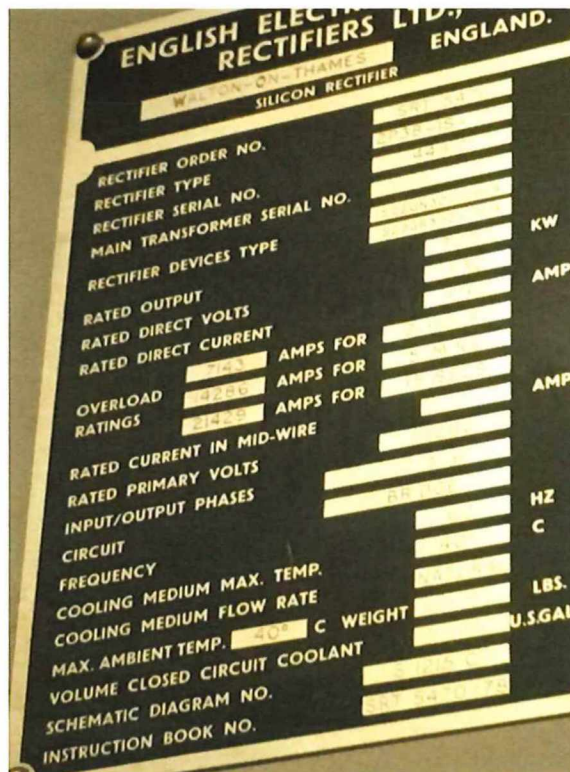


Photo 116



Photo 117



Photo 118

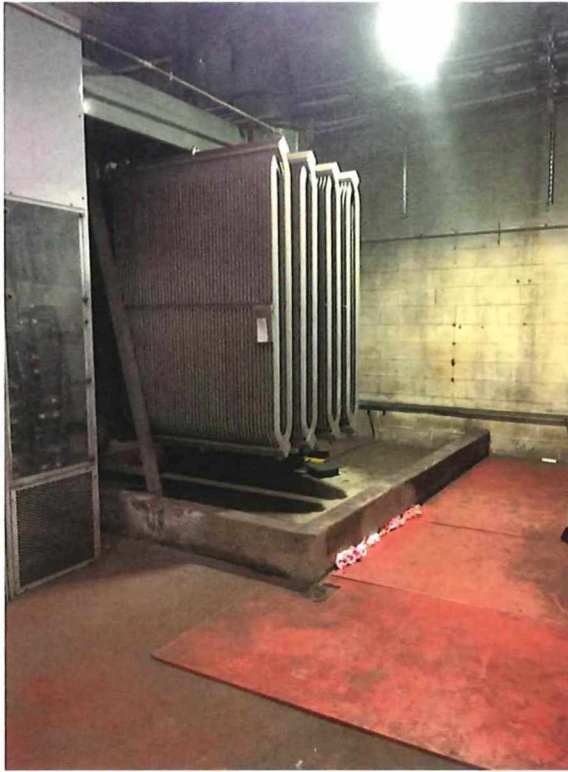


Photo 119



Photo 120



Photo 121

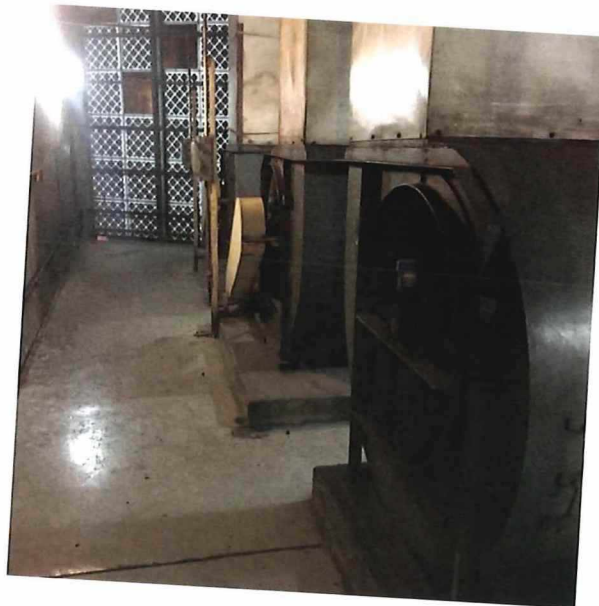


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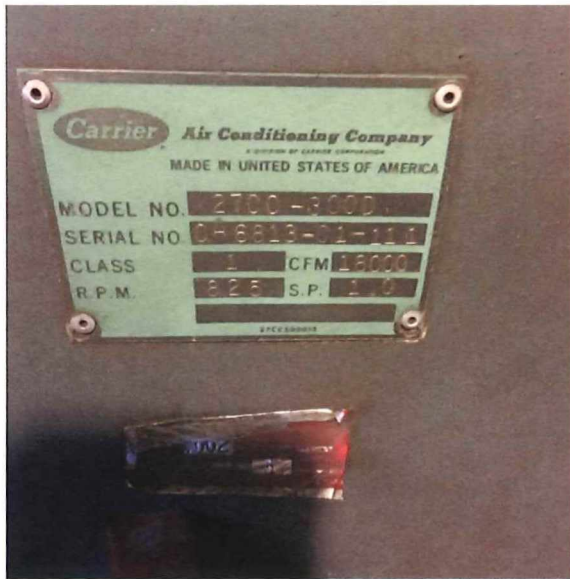


Photo 125

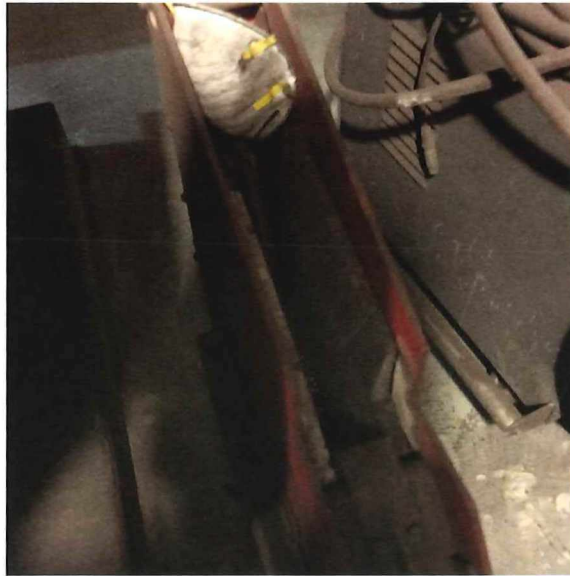


Photo 126



Photo 127

3.3.2 Ranstead



Photo 128



Photo 129



Photo 130



Photo 131



Photo 132



Photo 133



Photo 134



Photo 135



Photo 136

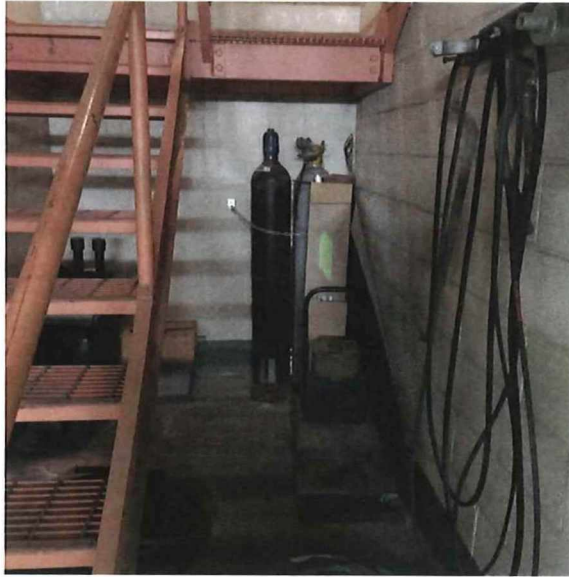


Photo 137



Photo 138



Photo 139



Photo 140

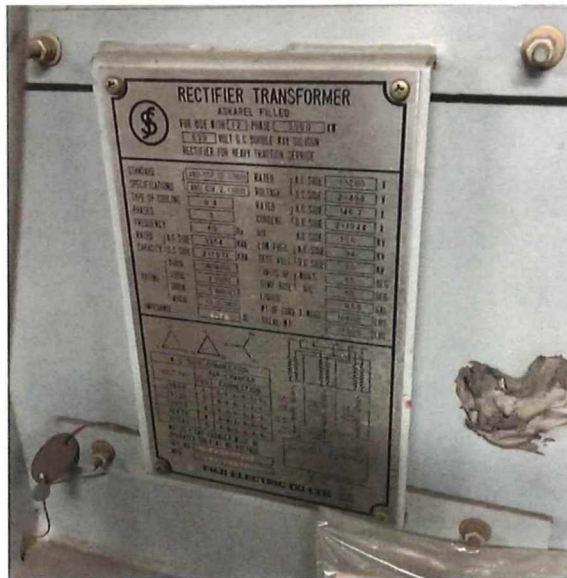


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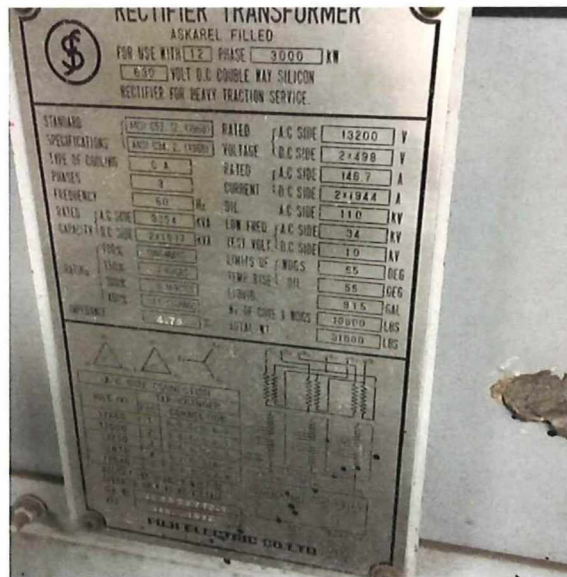


Photo 142



Photo 143

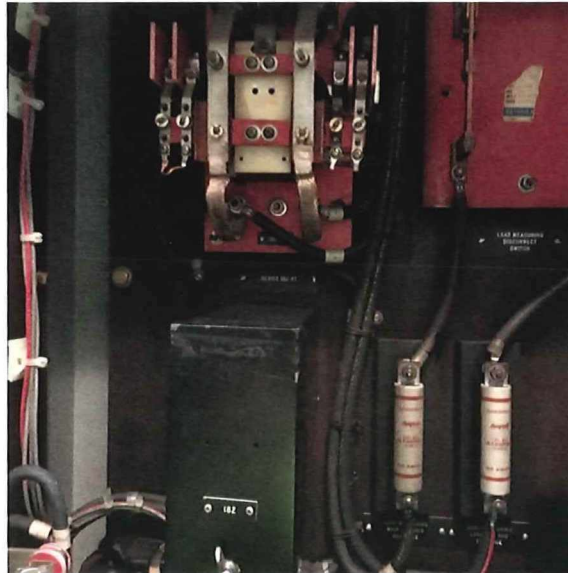


Photo 144

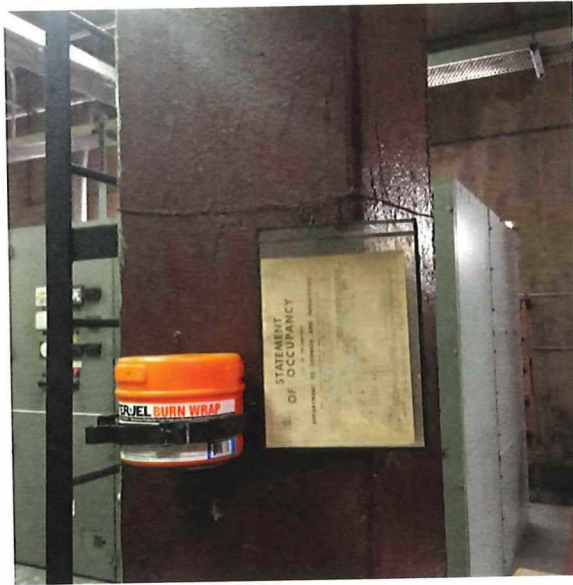


Photo 145



Photo 146



Photo 147



Photo 148

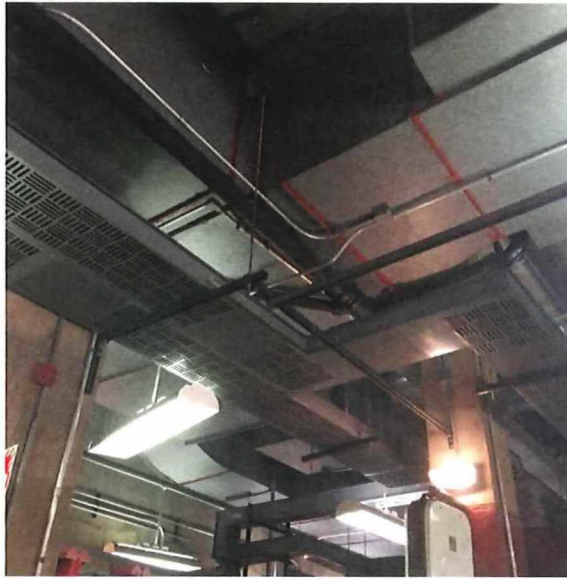


Photo 149



Photo 150



Photo 151

3.3.3 Ellen



Photo 152

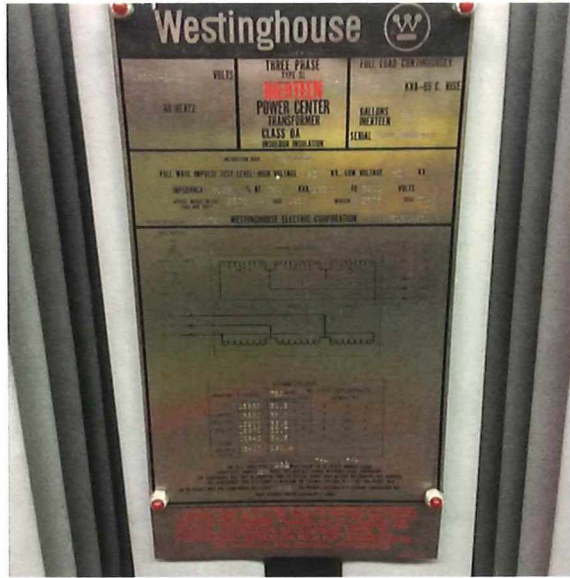


Photo 153



Photo 154

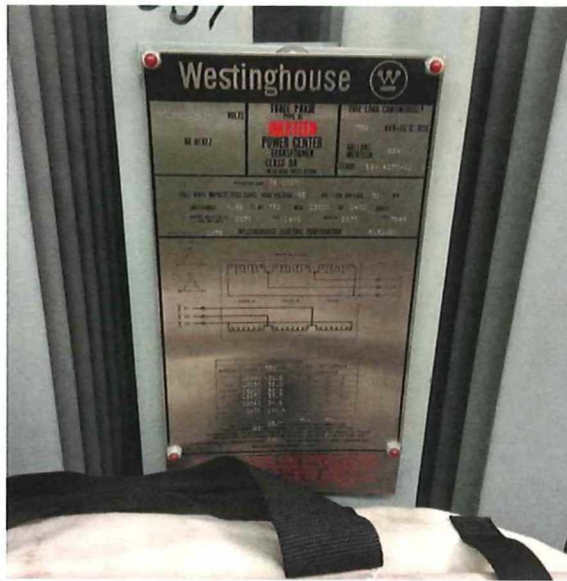


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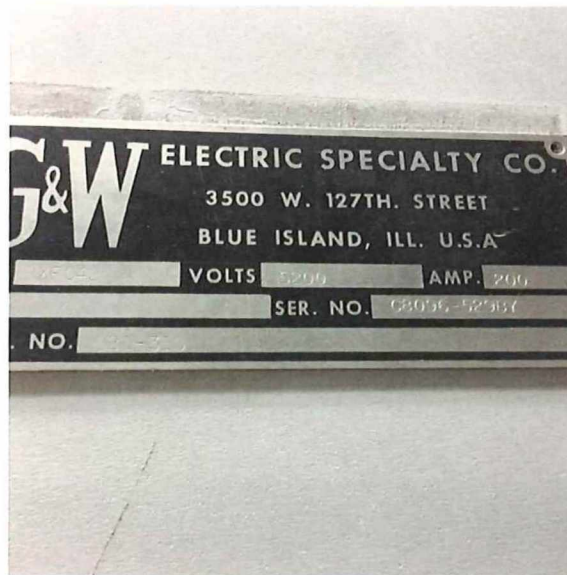


Photo 156



Photo 157



Photo 158



Photo 159

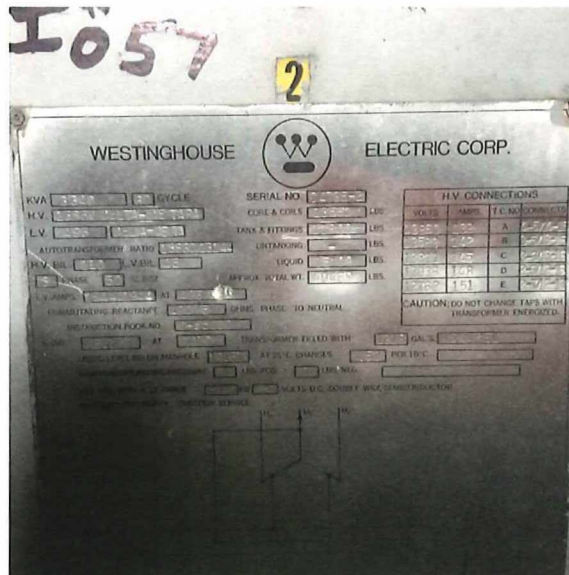


Photo 160



Photo 161

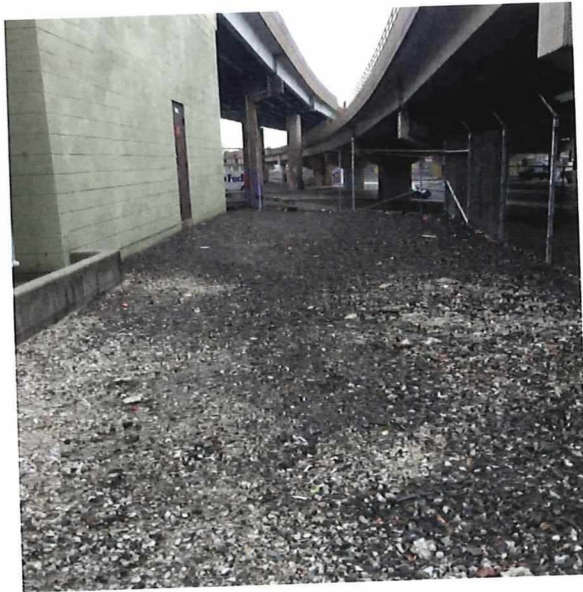


Photo 162



Photo 163



Photo 164

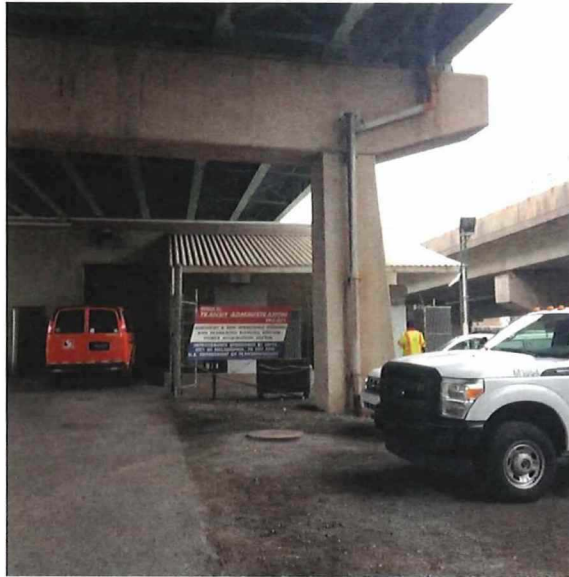


Photo 165

3.3.4 Broad

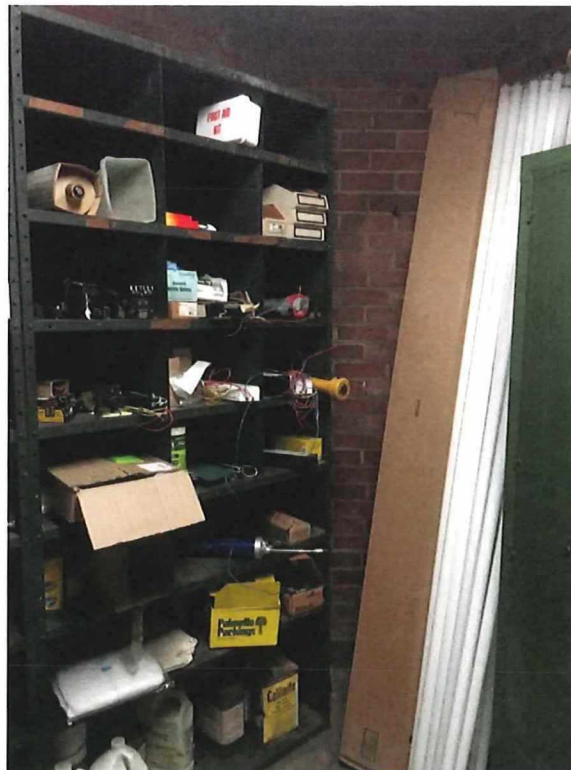


Photo 166



Photo 167

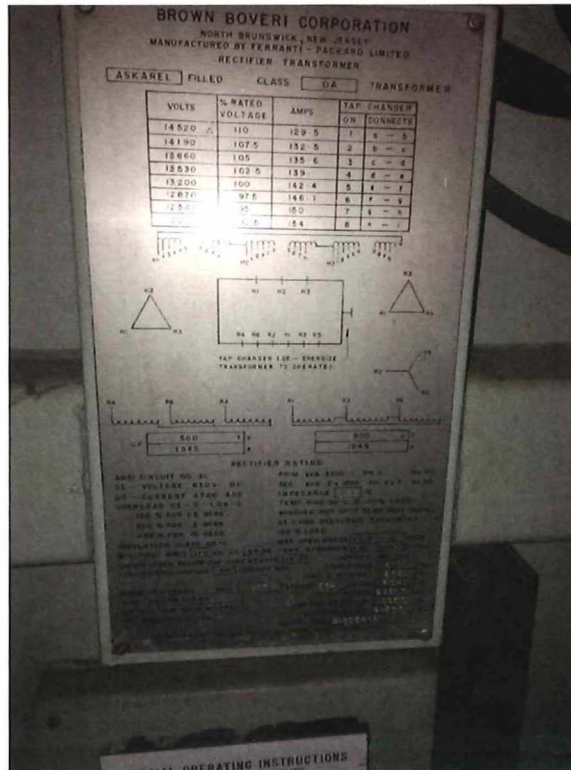


Photo 168



Photo 169



Photo 170



Photo 171

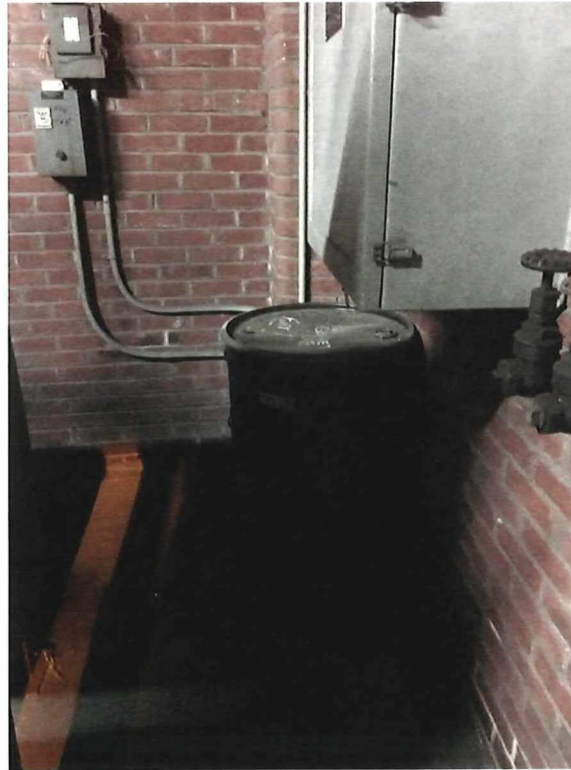


Photo 172



Photo 173



Photo 200



Photo 174

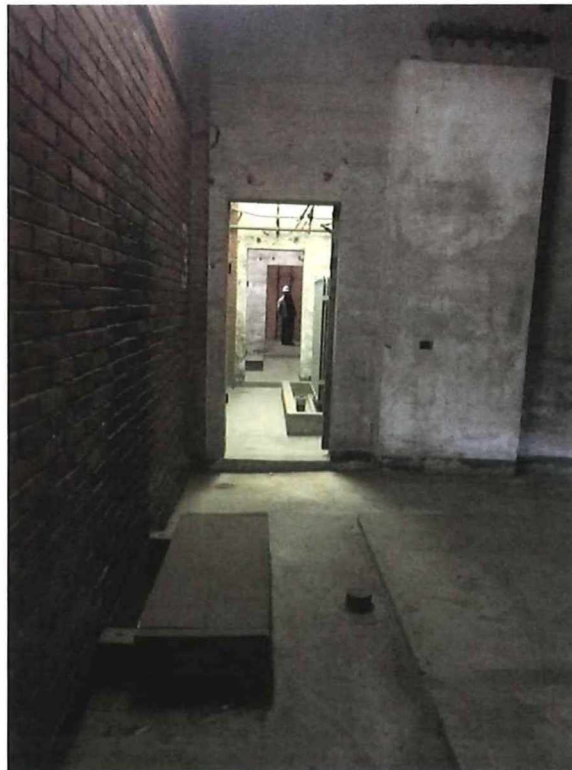


Photo 202

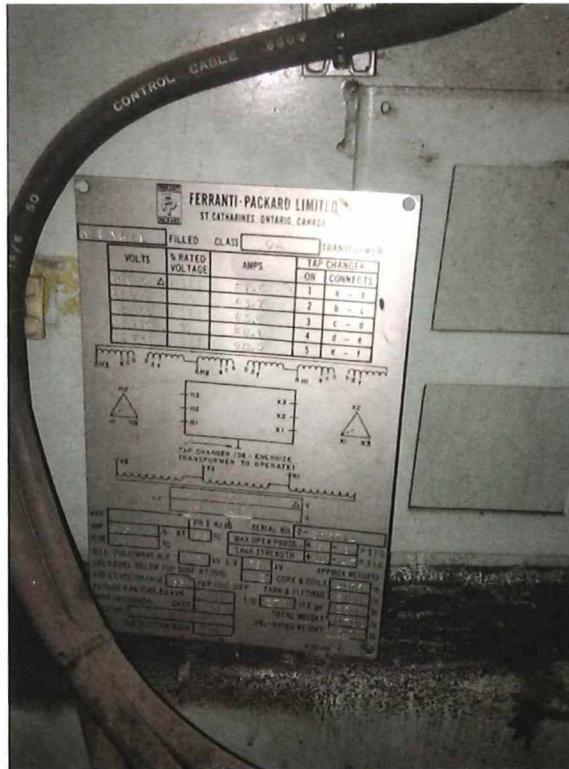


Photo 203

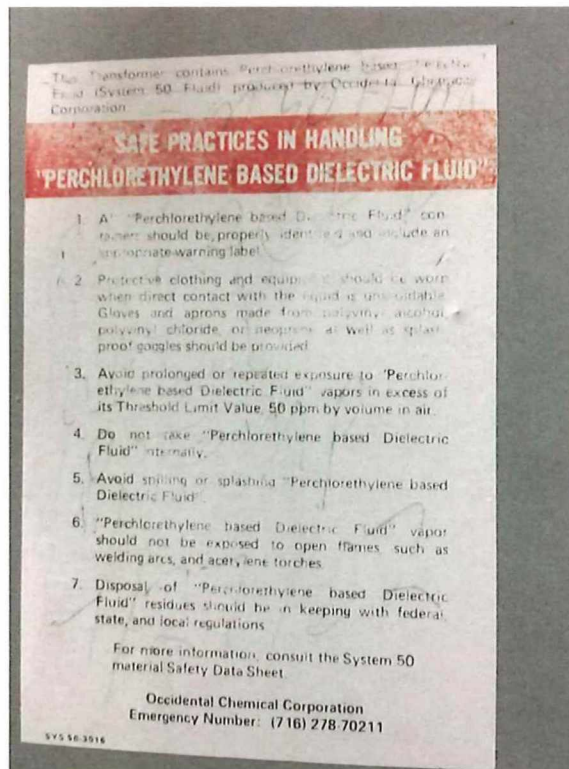


Photo 175

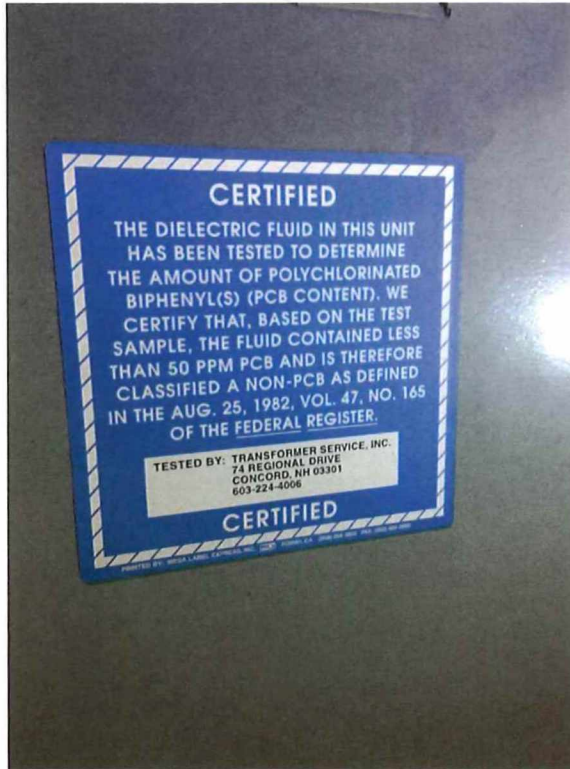


Photo 176

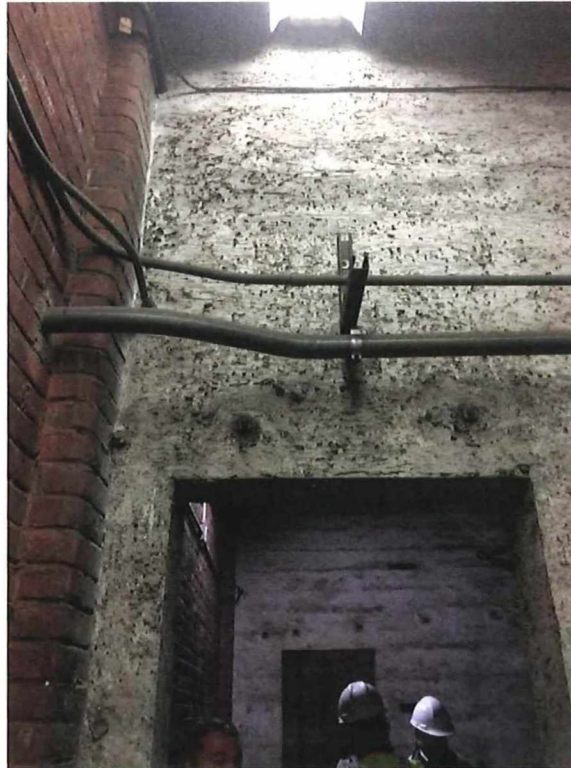


Photo 206



Photo 207



Photo 177



Photo 178

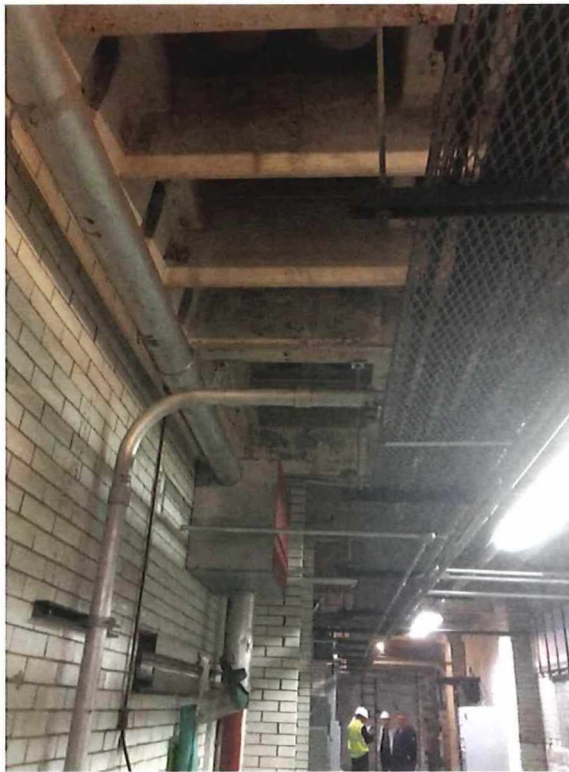


Photo 179



Photo 180



Photo 181



Photo 182

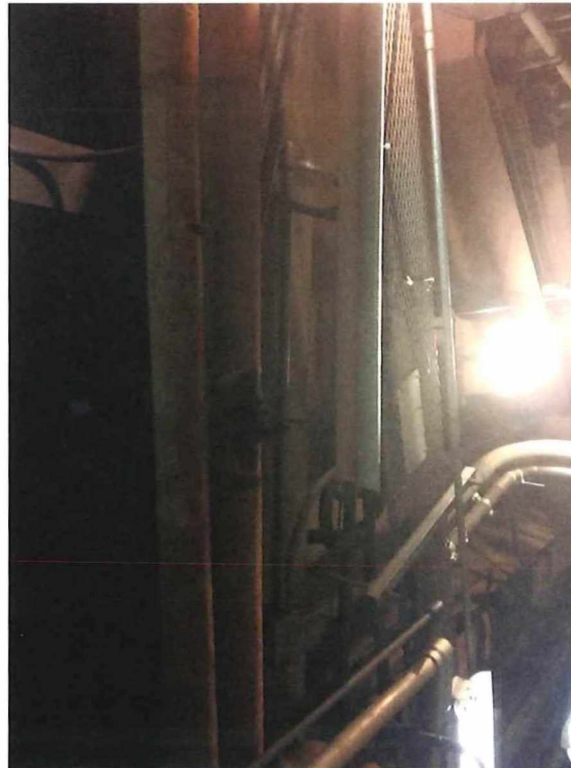


Photo 183

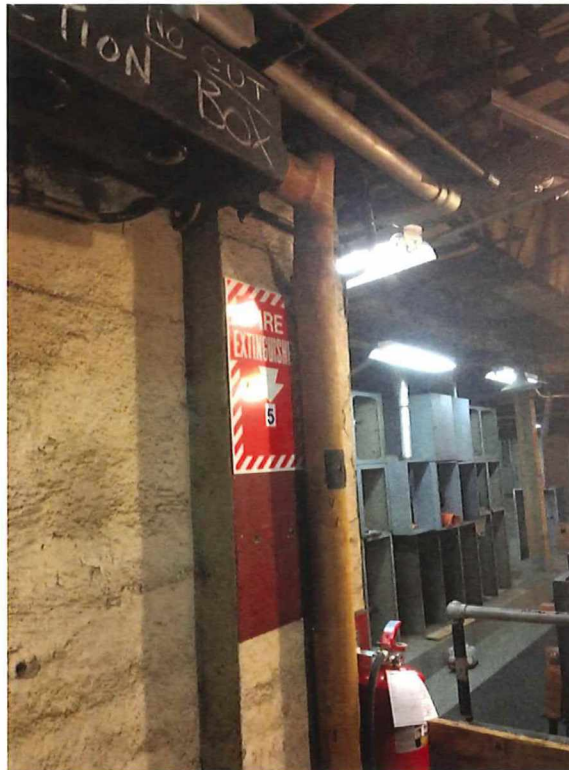


Photo 215



Photo 216

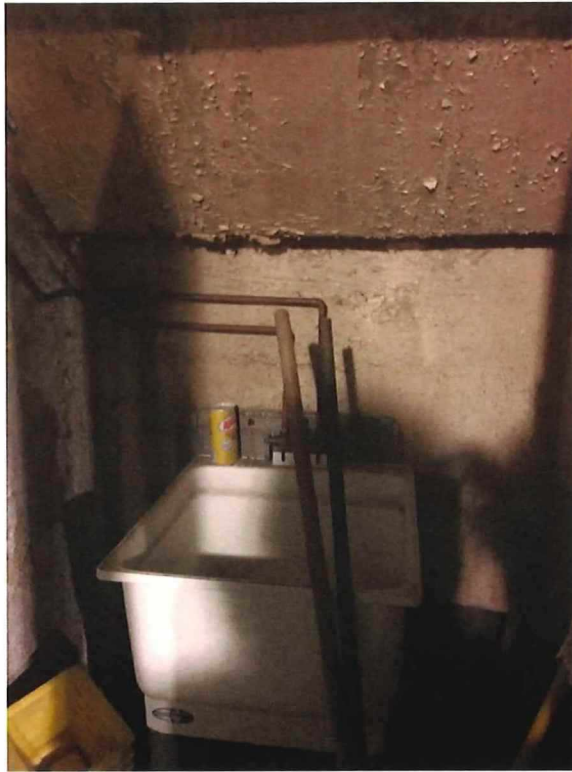


Photo 184



Photo 185



Photo 186



Photo 187

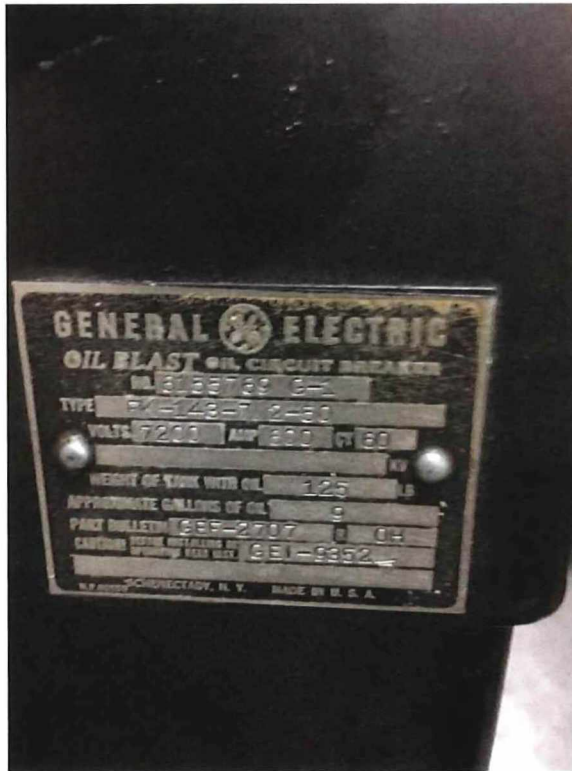


Photo 188



Photo 189



Photo 190



Photo 191



Photo 192

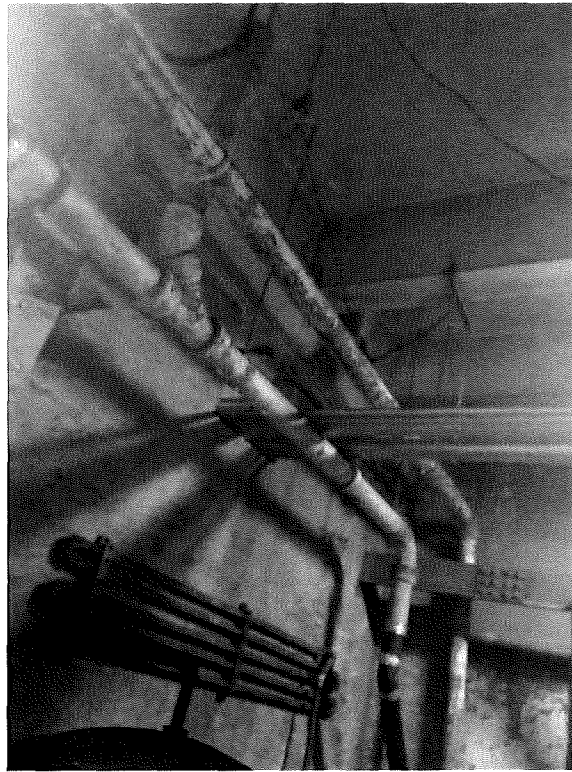


Photo 193

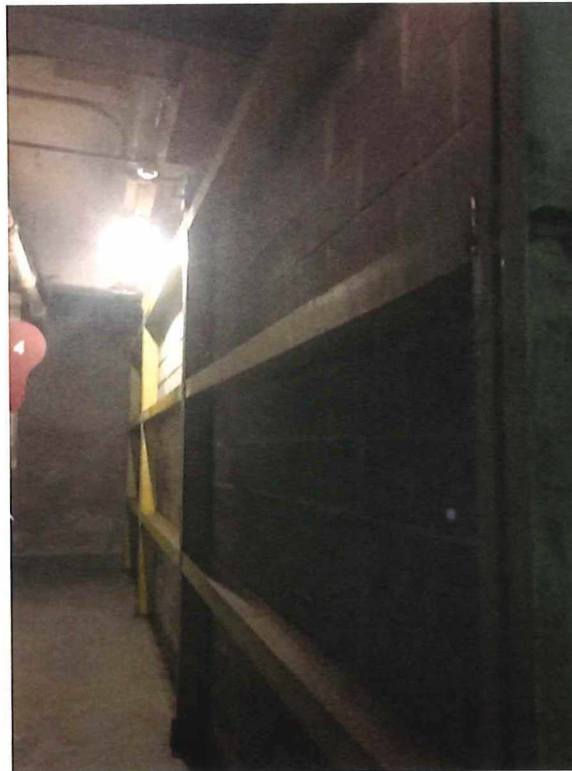


Photo 194

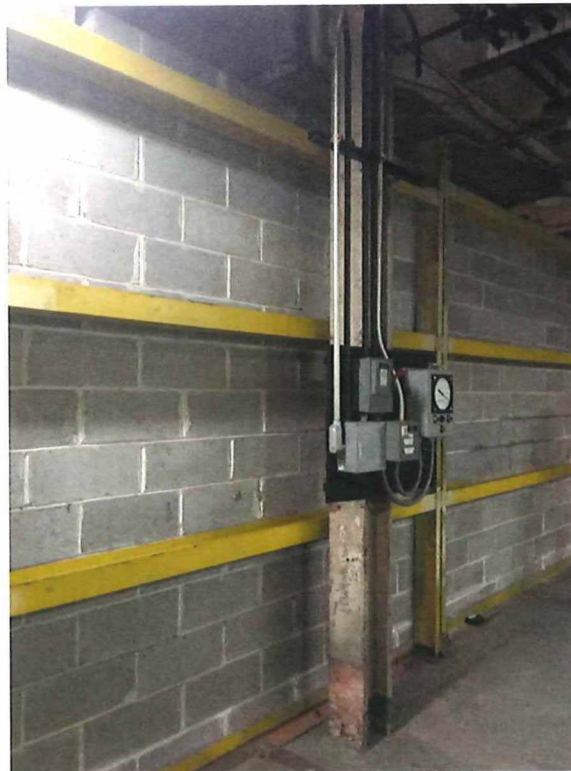


Photo 195



Photo 196



Photo 197



Photo 198



Photo 199

3.3.5 Park

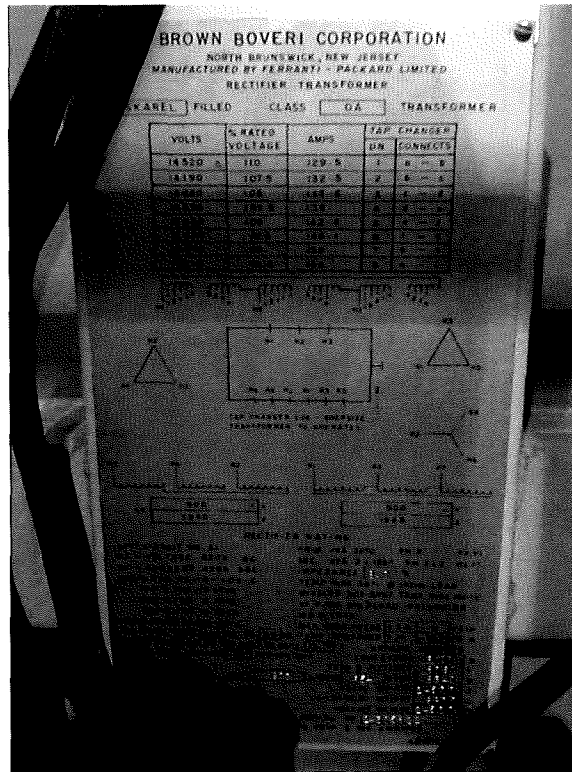


Photo 200



Photo 201



Photo 202



Photo 203



Photo 204

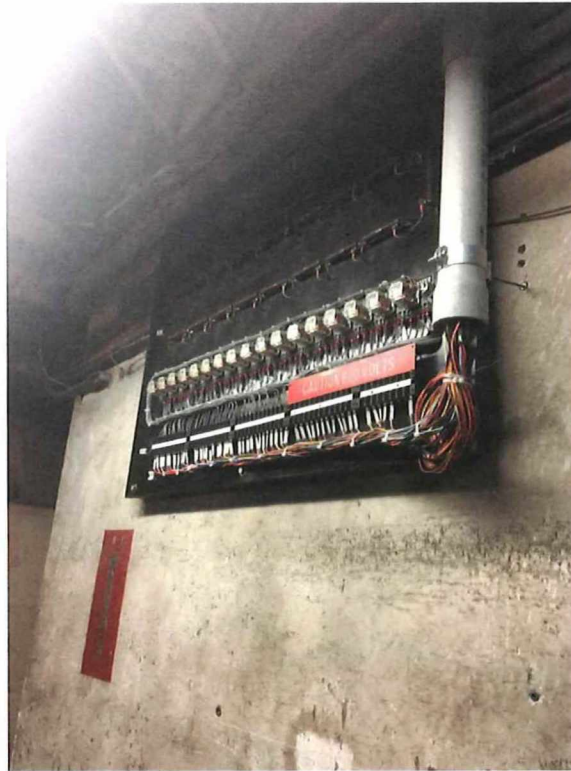


Photo 205

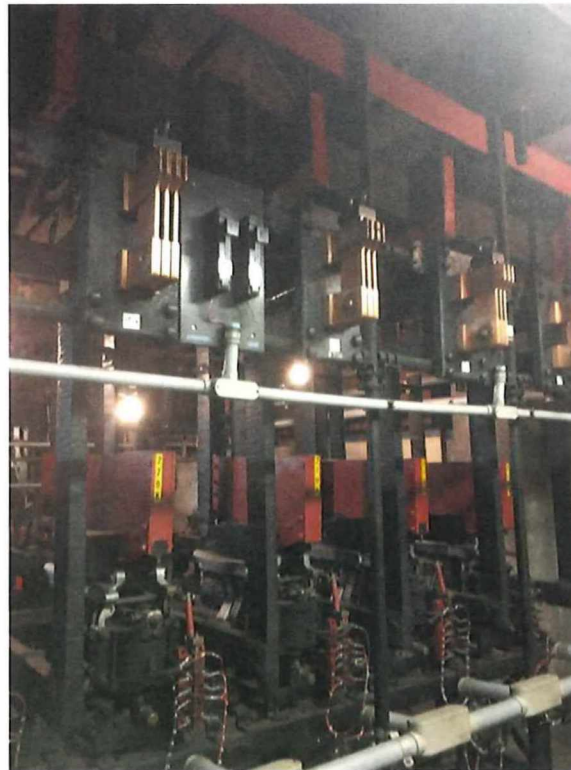


Photo 206

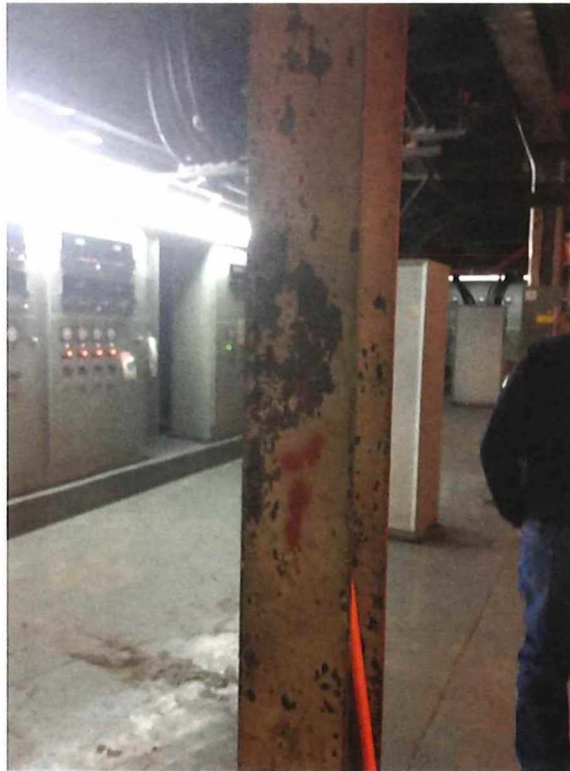


Photo 207

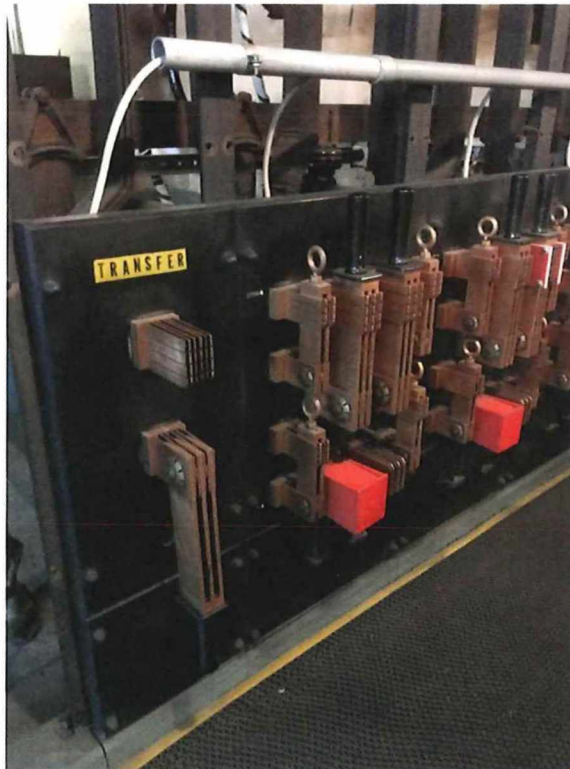


Photo 208



Photo 209



Photo 210



Photo 211



Photo 212



Photo 213



Photo 214



Photo 215



Photo 216



Photo 217

3.3.6 Loudon

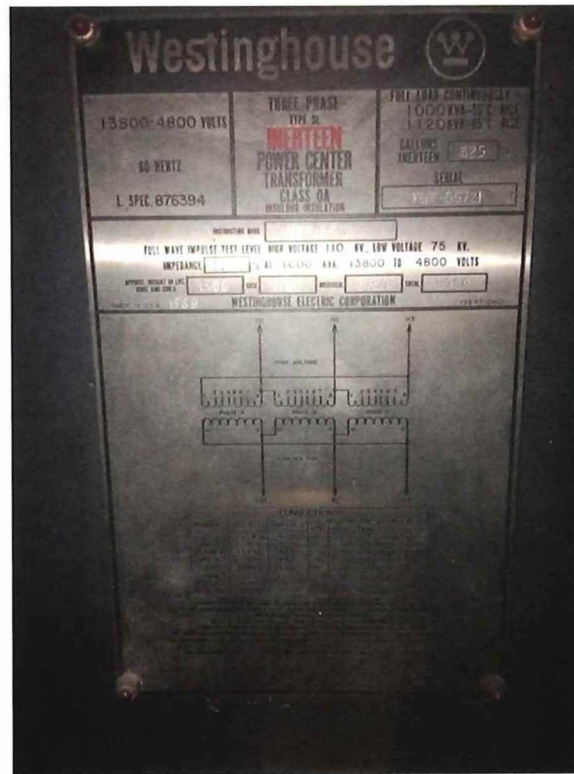


Photo 218

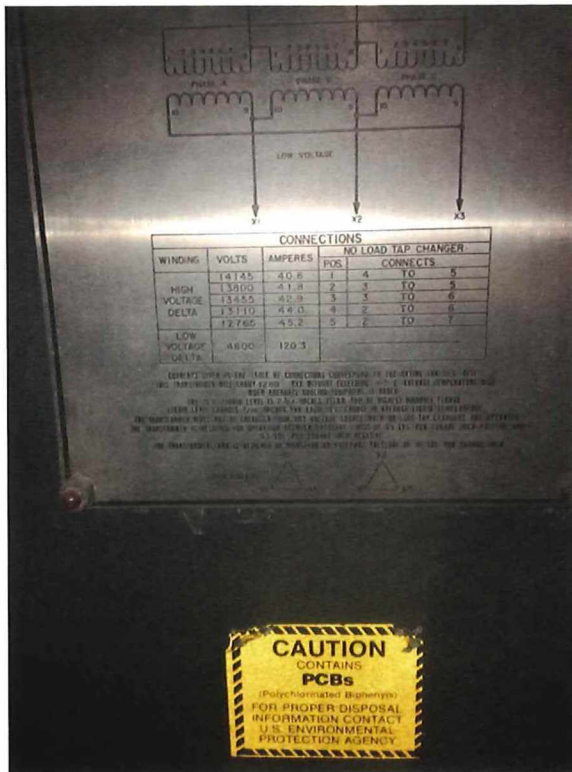


Photo 219



Photo 220



Photo 221



Photo 222

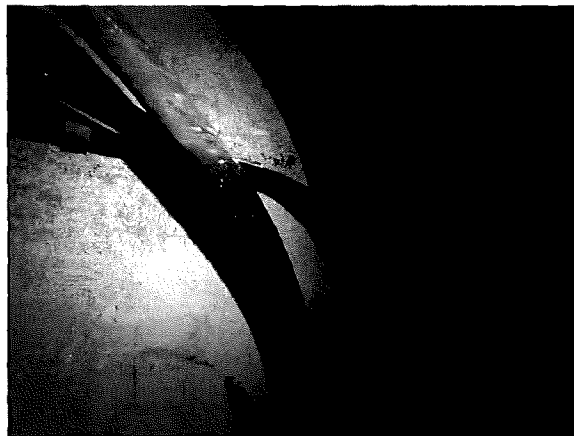


Photo 223



Photo 224



Photo 225



Photo 226



Photo 227



Photo 228



Photo 229

3.3.7 Castor



Photo 230

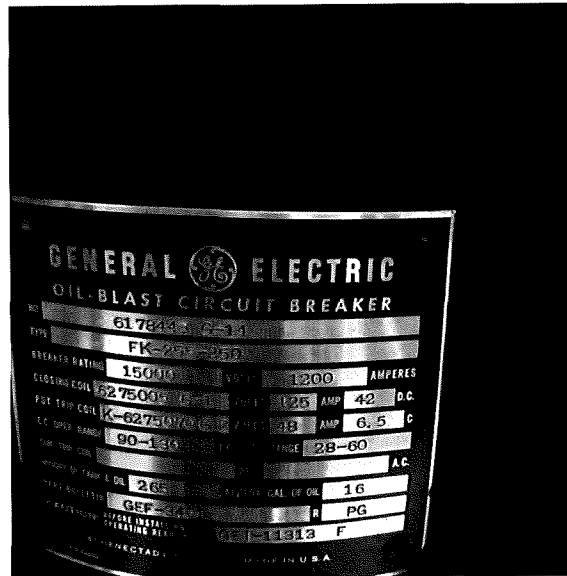


Photo 231



Photo 232

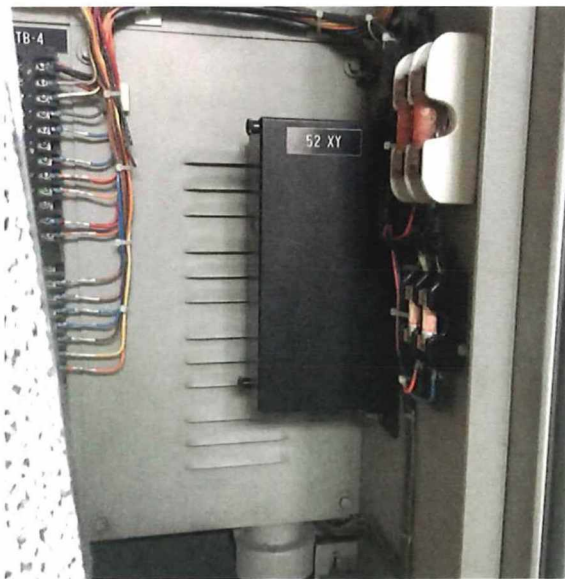


Photo 233



Photo 234



Photo 235



Photo 236



Photo 237



Photo 238



Photo 239

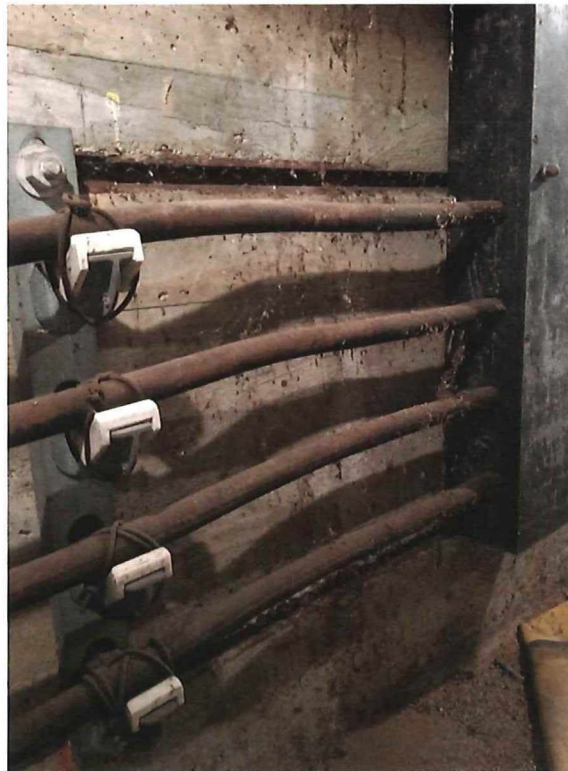


Photo 240



Photo 241



Photo 242



Photo 243

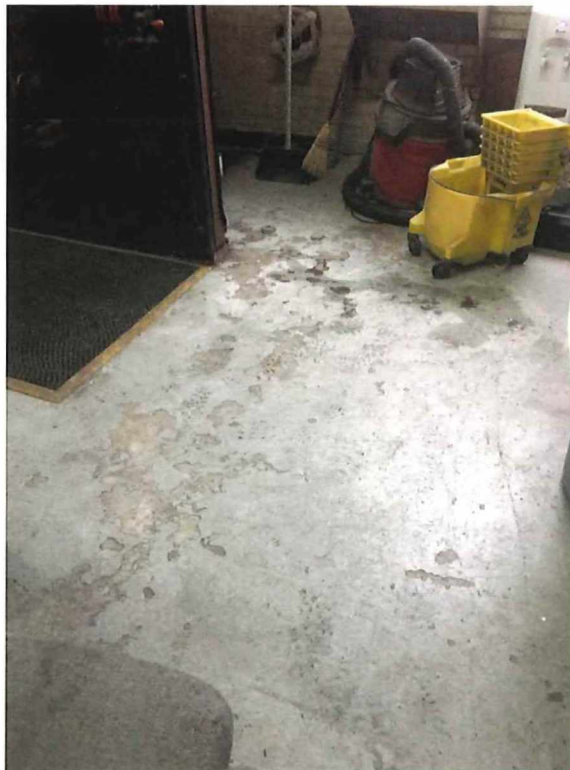


Photo 244



Photo 245



Photo 246



Photo 247



Photo 248



Photo 249