Missouri Department of NATURAL RESOURCES
dnr.mo.gov
Eric R. Greitens, Governor
Carol S. Comer, Director

March 20, 2017

Mr. James S. Cross
Senior Vice President
CenterPoint Development
1301 Burlington Street, Suite 200
North Kansas City, MO 64116

RE: Approval of Response to Comments on: Bannister Federal Complex, Demolition Plan, January 2016 and Bannister Federal Complex Abatement and Demolition Plan Supplements (ADPS) prepared by E W Wells Group, LLC

Dear Mr. Cross:

The Department of Natural Resources (department) original comments on the Bannister Federal Complex, Demolition Plan, identified certain topics that required more site specific plans. This led to the production of the Bannister Federal Complex Abatement and Demolition Plan Supplements (ADPS). While the ADPS was being produced and reviewed, the department approved other responses to the original set of demolition plan comments. However, overall approval was withheld pending review of the supplements to the Demolition Plan.

This letter provides final approval for both documents.

Thank you for your consideration and the opportunity to review both the Demolition Plan and the ADPS. If you have any questions concerning this letter, please contact Raymond Franson of the Federal Facilities Section at the Missouri Department of Natural Resources, Hazardous Waste Program, 500 NE Colbern Road, Lee's Summit, MO 64086-4710, or by phone at (816) 251-0757, or by email at raymond.franson@dnr.mo.gov

Sincerely

HAZARDOUS WASTE PROGRAM

Raymond Franson

Raymond Franson
Federal Facilities Section

RF:rl

Recycled paper

STATE OF MISSOURI
Jeremiah W. (Jay) Nixon, Governor • Sara Parker Pauley, Director
DEPARTMENT OF NATURAL RESOURCES
www.dnr.mo.gov

August 4, 2016

Mr. James S. Cross
Senior Vice President
CenterPoint Development
1301 Burlington Street, Suite 200
North Kansas City, MO 64116

RE: Reply to Response to Comments on Bannister Federal Complex, Demolition Plan, January 2016

Dear Mr. Cross:

The Missouri Department of Natural Resources (Department) reviewed the Brandenburg Response to Comments on the Bannister Federal Complex, Demolition Plan, January 2016 and has concerns with several of the responses. The Bannister Federal Complex is a site that has numerous environmental issues of concern that need to be considered as part of activities at the site. The Demolition Plan is an important document for moving the site towards beneficial reuse, and the Department believes that it needs to be a complete, detailed plan available for onsite workers and regulatory agencies to reference.

Thank you for your consideration and the opportunity to review the Demolition Plan. If you have any questions concerning this letter, please contact Raymond Franson of the Federal Facilities Section at the Missouri Department of Natural Resources, Hazardous Waste Program, 500 NE Colbern Road, Lee's Summit, MO 64086-4710, or by phone at (816) 251-0757, or by email at Raymond.franson@dnr.mo.gov.

Sincerely

HAZARDOUS WASTE PROGRAM

Raymond Franson

Raymond Franson

RF:rl

c: Mr. Robert E. Aston, Project Manager, U.S. EPA Region 7
Ms. Sybil Chandler, Environmental Health and Safety manager, National Security Nuclear Security Administration
Mr. Harvey Cohen, Ph.D. P.G., S.S. Papadopulos & Associates, Incorporated (via email)
Mr. Albert Guarino, National Nuclear Security Administration (via email)
Mr. Kevin Phillips, General Services Administration (via email)
Kansas City Regional Office, Missouri Department of Natural Resources

Recycled Paper

Review of Response to Comments on
MDNR Review of BFC Master Demolition Plan

Regarding the response to comments, there are three main concerns from CenterPoint's contractor response to comments:

1. "The objective of this plan is to detail procedures for the safe and environmentally conscious remediation and demolition of the BFC while minimizing impact to the neighboring community". "This document will also serve as a reference document for Brandenburg, CenterPoint, and CenterPoint Subcontractor personnel during demolition and remediation". The reply to comment #2 states that "Additional plans are not expected to be prepared". As currently written, this plan does not contain sufficient site specific information to allow for appropriate field oversite by the regulatory agency, nor could it be considered a tool for field staff to consult for site specific problems or issues. In addition, the plan does not include detail for both demolition and safety on many critical demolition procedures, including those for beryllium and mercury. Please see original comments 2, 11, 13, 14, 15, 20, 21, 26, 29 and 30.

2. In relation to issue one, there are two ways the level of detail in the demolition plan can be addressed. The first option is for the current demolition plan to be revised to include a much higher level of specificity including details on how various contaminates will be addressed, such as what suppression and housekeeping activities will be utilized, and how the site will be monitored to ensure that these issues are being appropriately addressed. This plan would need to be approved prior to the early transfer (and would thereby be approved prior to the start of any work at the site). The second option would be for the demolition plan to generally identify and discuss contaminants of concern at the site that are currently not adequately addressed during the demolition of the building (such as beryllium and mercury, etc.) and then, at a later date after the early transfer, provide work plans that contain the increase level of specificity to what is mentioned in option one. Please note that due to the site's designation as an early transfer property, if the transfer is approved, the demolition plan and its related work plans become documents that require review and approval by the department prior to any of these activities occurring at the site.

3. Based on the scope of work being undertaken at the site and in consideration of the contaminates present, will all staff have taken 40 Hour HAZWOPER training?

Specific comments (the number at the front of each specific comment denotes which response to comments is being referenced):

2. The response to the lack of detail in the document is: "Additional work plans are not expected to be prepared". This raises concerns that Brandenburg field workers will not have the detailed procedures needed "for the safe and environmentally conscious remediation and demolition of the BFC" promised in the document's purpose statement. Regulators will also not have these detailed procedures as a reference for safe field

oversight. In addition, the Bannister Federal Complex is recognized by regulators and the public as a unique site with a complex set of issues. A general demolition plan that does not address certain issues of historical public issues in more detail could raise significant concerns with the public and surrounding community when available for their review. If a more general demolition plan is going to be submitted initially, be advised that site specific work plans will need to be submitted, reviewed for environmental concerns and approved, prior to any demolition or remediation activities occurring at the site. Also, please recognize that Special Permit Condition, XVII. D. 3 of the Missouri Hazardous Waste Management Facility Part I Permit requires site specific work plans for the removal of buildings and or pavements that act as institutional controls for an existing remedy.

3. The response is generic and does not provide any assurance that the workers and the contractors are aware of what would trigger regulatory notification. In addition, this information should be included in the plan in detail so that field workers can easily reference it.

7. Yes. Please revise the document to specifically reference that "Any modification, abandonment, or reinstallation of monitoring wells or recovery wells shall comply with Missouri Well Construction Rules contained in 10 CSR 23-4."

11. Please provide a remediation plan for beryllium remediation, and state what level beryllium will be remediated to.

12. In reference to the encapsulation of areas contaminated by beryllium, inquires to the current site owner or operator would provide the best information regarding areas that were previously encapsulated for beryllium. Based on emails, it is our understanding that one of the recent activities (May 2016) at the site was remediation of these encapsulated areas. Please clarify whether these remediation activities addressed all areas that were previously encapsulated. Also, how will sampling of these areas be addressed to determine if the areas now meet acceptable exposure levels?

14. In reference to methods of containment and collection of wash water that is generated, in areas where specific final conditions are known, such as areas containing beryllium, or other known hazards, the specific methods of containment should be outlined within the plan, so that the plan includes plans for field workers or field oversight personnel to reference for the removal of a known hazard.

15. The response to comments states that "Spill controls, countermeasures, and remediation are outlined within the Demolition Plan and will be followed during handling of the mercury-containing equipment referenced". The spill controls, countermeasures, and remediation for mercury is not the same as other contaminants covered in the document. Please provide procedures for spill control, countermeasures and remediation for mercury that addresses the hazard and clean up requirements in the document.

26. Please revise the document to make it clear that Department personnel are not subject to search. It is agreed that personnel will follow the remainder of the Security Safety Policy and Procedure as well as the site Health and Safety Requirements.

30. The site specific health and safety plan does not address SOPs for the handling of beryllium contaminated material. Please include an SOP for the handling of beryllium contaminated material.

Brandenburg® Industrial Service Company
2625 South Loomis Street
Chicago, Illinois 60608-5414
Phone (312) 326-5800
FAX (312) 326-5055

Brandenburg®

www.Brandenburg.com

September 12, 2016

Mr. Jim Cross
CenterPoint Properties
1301 Burlington Street, Suite 200
North Kansas City, MO 64116

Re: Responses to August MDNR Comments on Demolition Plan

Mr. Cross:

After reviewing the Missouri Department of Natural Resources' August comments on the Demolition Plan and our conference call last Wednesday, Brandenburg is submitting the following responses for your and the MDNR's review.

With the addition of preparing more detailed site specific work plans, we would expect that these items will remain "open" until the submittal, review and approval process with the regulators has occurred.

Please let me know if you have any further questions or need any additional information.

Yours:
Brandenburg Industrial Service Co

Michael Voigt

Brandenburg® Industrial Service Company
2625 South Loomis Street
Chicago, Illinois 60608-5414
Phone (312) 326-5800
FAX (312) 326-5055
www.brandenburg.com

Comments Related to General Concerns:

1. "The objective of this plan is to detail procedures for the safe and environmentally conscious remediation and demolition of the BFC while minimizing impact to the neighboring community". "This document will also serve as a reference document for Brandenburg, CenterPoint, and CenterPoint Subcontractor personnel during demolition and remediation". The reply to comment #2 states that "Additional plans are not expected to be prepared". As currently written, this plan does not contain sufficient site specific information to allow for appropriate field oversite by the regulatory agency, nor could it be considered a tool for field staff to consult for site specific problems or issues. In addition, the plan does not include detail for both demolition and safety on many critical demolition procedures, including those for beryllium and mercury. Please see original comments 2, 11, 13, 14, 15, 20, 21, 26, 29 and 30.

Response:

Demo plan has been amended as follows in Section 1.0 (p. 2 of Demolition Plan):

Based upon our conference call conversations, more detailed site-specific work plans will be prepared and submitted to the Regulators. All work plans require review and approval prior to transfer and prior to work commencing in the field. The following plans are expected to be expanded upon:

- *Asbestos abatement*
- *Beryllium removal*
- *Heavy metal containing paint removal*
- *PCB contaminated structure removal*
- *Hazardous sludge removal*
- *Mercury spill procedures*
- *Radiation alarm procedure and recommendations for monitoring and screening of demolition materials prior to leaving the site for disposal and/or to be crushed and re-used as clean fill on site*
- *Air monitoring*
- *Emergency Radiation Response Plan*

Please note that CenterPoint is in the process of writing a Request for Proposal (RFP) for soliciting the services of a Safety Professional/Industrial Hygienist to prepare work plans. A draft copy of the RFP will be submitted to MDNR.

Brandenburg® Industrial Service Company
2625 South Loomis Street
Chicago, Illinois 60608-5414
Phone (312) 326-5800
FAX (312) 326-5055
www.brandenburg.com

Comment:

2. In relation to issue one, there are two ways the level of detail in the demolition plan can be addressed. The first option is for the current demolition plan to be revised to include a much higher level of specificity including details on how various contaminates will be addressed, such as what suppression and housekeeping activities will be utilized, and how the site will be monitored to ensure that these issues are being appropriately addressed. This plan would need to be approved prior to the early transfer (and would thereby be approved prior to the start of any work at the site). The second option would be for the demolition plan to generally identify and discuss contaminants of concern at the site that are currently not adequately addressed during the demolition of the building (such as beryllium and mercury, etc.) and then, at a later date after the early transfer, provide work plans that contain the increase level of specificity to what is mentioned in option one. Please note that due to the site's designation as an early transfer property, if the transfer is approved, the demolition plan and its related work plans become documents that require review and approval by the department prior to any of these activities occurring at the site.

Response:

As noted in our response to comment #1, site-specific work plans will be developed with assistance from a Safety Professional/Industrial Hygienist. Additionally, the Safety Professional/Industrial Hygienist will review the current Demolition Plan and assist with providing additional specificity as to how contaminants will be addressed, identification of housekeeping activities, and suppression activities that will be utilized as well as monitoring of these issues to insure they are being adequately addressed.

Comment:

3. Based on the scope of work being undertaken at the site and in consideration of the contaminates present, will all staff have taken 40 Hour HAZWOPER training?

Response:

Brandenburg will follow the OSHA requirements for HAZWOPER training for site personnel.

Demo plan amended to the following (Section 4.0 Integration with Other Work Plans of Demolition Work Plan): "Health and safety requirements throughout this project may be dynamic and change from day-to-day operations. Brandenburg will complete internal task-specific safety analyses prior to each task being performed. As part of these analyses, Brandenburg will follow OSHA requirements for HAZWOPER training for site personnel as necessary."

Brandenburg® Industrial Service Company
2625 South Loomis Street
Chicago, Illinois 60608-5414
Phone (312) 326-5800
FAX (312) 326-5055
www.brandenburg.com

Specific Comments:

2. The response to the lack of detail in the document is: "Additional work plans are not expected to be prepared". This raises concerns that Brandenburg field workers will not have the detailed procedures needed "for the safe and environmentally conscious remediation and demolition of the BFC" promised in the document's purpose statement. Regulators will also not have these detailed procedures as a reference for safe field oversight. In addition, the Bannister Federal Complex is recognized by regulators and the public as a unique site with a complex set of issues. A general demolition plan that does not address certain issues of historical public issues in more detail could raise significant concerns with the public and surrounding community when available for their review. If a more general demolition plan is going to be submitted initially, be advised that site specific work plans will need to be submitted, reviewed for environmental concerns and approved, prior to any demolition or remediation activities occurring at the site. Also, please recognize that Special Permit Condition, XVII. D. 3 of the Missouri Hazardous Waste Management Facility Part I Permit requires site specific work plans for the removal of buildings and or pavements that act as institutional controls for an existing remedy.

Response:

Based upon the pre-transfer development, review and approval of site-specific work plans as well as additional review and input into the Demolition Plan from CenterPoint's Safety Professional/Industrial Hygienist, we believe that the Demolition and Remediation of the Bannister Federal Complex will be conducted in a safet and environmentally conscious manner that is also protective to the community and the environment.

Comment:

3. The response is generic and does not provide any assurance that the workers and the contractors are aware of what would trigger regulatory notification. In addition, this information should be included in the plan in detail so that field workers can easily reference it.

Response:

Please note that Brandenburg Administrators, Project Management and/or Executives who are knowledgeable and familiar with these referenced notifications and written plans will be responsible for completing them. These will all be submitted in accordance with all federal, state, and local regulations. The finalized site specific work plans will incorporate items that would trigger notifications to the regulators.

Brandenburg® Industrial Service Company
2625 South Loomis Street
Chicago, Illinois 60608-5414
Phone (312) 326-5800
FAX (312) 326-5055
www.brandenburg.com

Comment:

7. Yes. Please revise the document to specifically reference that "Any modification, abandonment, or Reinstallation of monitoring wells or recovery wells shall comply with Missouri Well Construction Rules contained in 10 CSR 23-4."

Work plan amended to the following (Section 8.0 Areas to Be Protected): "Any modification, abandonment, or reinstallation of monitoring wells or recovery wells shall comply with Missouri Well Construction Rules contained in 10 CSR 23-4."

Response:

This will be included with the updated version.

Comment:

11. Please provide a remediation plan for beryllium remediation, and state what level beryllium will be remediated to.

Response:

As noted in Response to Comment #2 above, a more detailed site-specific work plan for the beryllium removal will be prepared and submitted to the Regulators for review and approval prior to transfer.

Comment:

12. In reference to the encapsulation of areas contaminated by beryllium, inquires to the current site owner or operator would provide the best information regarding areas that were previously encapsulated for beryllium. Based on emails, it is our understanding that one of the recent activities (May 2016) at the site was remediation of these encapsulated areas. Please clarify whether these remediation activities addressed all areas that were previously encapsulated. Also, how will sampling of these areas be addressed to determine if the areas now meet acceptable exposure levels?

Response:

This information will be reviewed with the current owner/operator prior to completion of the more detailed site-specific beryllium work plan.

Comment:

14. In reference to methods of containment and collection of wash water that is generated, in areas where specific final conditions are known, such as areas containing beryllium, or other known hazards, the specific methods of containment should be outlined within the plan, so that the plan includes plans for field workers or field oversight personnel to reference for the removal of a known hazard.

Brandenburg® Industrial Service Company
2625 South Loomis Street
Chicago, Illinois 60608-5414
Phone (312) 326-5800
FAX (312) 326-5055
www.brandenburg.com

Response:

As noted above, more detailed site-specific work plans will be prepared and submitted for Regulatory review and approval prior to transfer.

Where wash waters will be utilized during decontamination, a detailed description of the contaminant and collection will be included.

Comment:

15. The response to comments states that "Spill controls, countermeasures, and remediation are outlined within the Demolition Plan and will be followed during handling of the mercury-containing equipment referenced". The spill controls, countermeasures, and remediation for mercury is not the same as other contaminants covered in the document. Please provide procedures for spill control, countermeasures and remediation for mercury that addresses the hazard and clean up requirements in the document.

Response:

As noted above, one of the more detailed work plans will be for Mercury spill procedures. This will be completed, submitted to the Regulators and approved prior to transfer.

Comment:

26. Please revise the document to make it clear that Department personnel are not subject to search. It is agreed that personnel will follow the remainder of the Security Safety Policy and Procedure as well as the site Health and Safety Requirements.

Response:

Brandenburg will add a statement that Department personnel are not subject to search.

Demo plan amended as follows under section 6.0 – Security Operations: "Missouri Department of Natural Resources staff may periodically visit the site to conduct inspections, oversee regulatory issues, etc. These personnel will not be subject to search, but will be required to obey the remainder of the Security Safety Policy and Procedure as well as the health and safety requirements of the site.

Comment:

30. The site specific health and safety plan does not address SOPs for the handling of beryllium contaminated material. Please include an SOP for the handling of beryllium contaminated material.

Brandenburg® Industrial Service Company
2625 South Loomis Street
Chicago, Illinois 60608-5414
Phone (312) 326-5800
FAX (312) 326-5055
www.brandenburg.com

Response:

As noted above, a more detailed work plan for the beryllium removal will be prepared and submitted for Regulator review and approval prior to transfer.

There is no plan to create an SOP for beryllium, since the detailed work plans will contain more detailed and site-specific aspects than a more general SOP.

STATE OF MISSOURI
Jeremiah W. (Jay) Nixon, Governor • Sara Parker Pauley, Director
DEPARTMENT OF NATURAL RESOURCES
www.dnr.mo.gov

March 1, 2016

Mr. James S. Cross
Senior Vice President
CenterPoint Development
1301 Burlington Street, Suite 200
North Kansas City, MO 64116

RE: Bannister Federal Complex, Demolition Plan, January 2016

Dear Mr. Cross:

The Missouri Department of Natural Resources (Department) reviewed the subject Bannister Federal Complex, Demolition Plan, January 2016 that was submitted to us in February 2016 and has provided the attached comments.

Thank you for your consideration and the opportunity to review the Demolition Plan. If you have any questions concerning this letter, please contact Raymond Franson of the Federal Facilities Section at the Missouri Department of Natural Resources, Hazardous Waste Program, 500 NE Colbern Road, Lee's Summit, MO 64086-4710, or by phone at (816) 251-0757, or by email at raymond.franson@dnr.mo.gov.

Sincerely

HAZARDOUS WASTE PROGRAM

Tiffany Drake
Federal Facilities Section

TD:rfr

Attachment

c: Mr. Robert E. Aston, Project Manager, U.S. EPA Region 7
Ms. Sybil Chandler, Environmental Health and Safety manager, National Security Nuclear Security Administration
Mr. Harvey Cohen, Ph.D. P.G., S.S. Papadopulos & Associates, Incorporated (via email)
Mr. Kingsley Edwards, National Nuclear Security Administration (via email)
Mr. Albert Guarino, National Nuclear Security Administration (via email)
Mr. Kevin Phillips, General Services Administration (via email)
Mr. Rich Nussbaum, Missouri Department of Natural Resources, Permits (via email)
Kansas City Regional Office, Missouri Department of Natural Resources

Recycled Paper

Comments on:
BANNISTER FEDERAL COMPLEX
DEMOLITION PLAN
January 2016

1. Introduction pdf p. 16, "The objective of this plan is to detail procedures for the safe and environmentally conscious remediation and demolition of the BFC while minimizing impact on the neighboring community". The title of the plan is "Demolition Plan". Why does this purpose statement include "remediation" when remediation is not part of this plan? Remediation and demolition are scheduled to occur concurrently. This plan delineates the phasing of demolition in stages for efficiency and cost effectiveness. Isn't it important to include remedial activities within this phasing for the same reasons?

2. Introduction pdf p. 16, "This document will also serve as a reference document for Brandenburg, CenterPoint, and CenterPoint Subcontractor personnel during demolition and remediation". Despite its length, this document is very short on details of how any of the work will be performed making detailed comments on regulatory requirements of the work difficult. More importantly, it is short on details that field personnel can reference to actually perform the work. Will more detailed workplans be prepared for each component of the demolition work? If so, will the Department be afforded time to review the plans for regulatory requirements?

3. Introduction "pdf p. 16, As field conditions may change throughout this project, this multi-faceted Plan is dynamic and subject to revision at any time." And pdf p. 18, "During this project, if any task occurs that is not covered in this Demolition Work Plan (DWP), the individual responsible for that task will inform Brandenburg's Project Manager.". The demolition work is covered by various Department programs including RCRA, Air, Water and Solid Waste. How will the Department be informed of changes during the work that might have regulatory impact?

4. Introduction pdf p. 18, "The DWP was developed to: Outline regulatory requirements". This would be very helpful for both the Department and workers in the field. However, we did not find any sections of plan that outline regulatory requirements. Please add these sections.

5. Section 3.3, pdf p. 20, Compliance With Existing Permits, Please change "Missouri Hazardous Waste Management Facility Part B Permit" to "Missouri Hazardous Waste Management Facility Part I Permit".

6. Section 3.3, pdf p. 20, Compliance With Existing Permits. Please note that the Missouri Hazardous Waste Management Facility Part I Permit and the Missouri State Operating Permit are permits that will transfer to the new owner/operator and stay with the BFC. Please rewrite this section to clarify that the new owner/operator will comply with the versions of these permits in place for the site at the time of demolition.

7. Section 8.0, Areas to be Protected, pdf p. 29, "Groundwater monitoring wells, piezometers, recovery wells, and permitted outfalls. These structures will be flagged in the field by Brandenburg and free access to these structures will be maintained to allow continuous access during demolition. If removal or altering of these structures is to occur, it will be under coordination with Brandenburg to facilitate work in order to minimize undesired damage." This does not appear consistent with SSPA at the 12/16/2015 monthly meeting, the notes of which state that 200 plus wells on site will need abandonment, in a phased approach, based upon demolition activities. Please update the plan to clarify whether wells will be maintained or abandoned and reinstalled. Please add language to the demolition plan that states, "Any modification, abandonment, or reinstallation of monitoring wells or recovery wells shall comply with Missouri Well Construction Rules contained in 10 CSR 23-4.

8. 10.1.5 Environmental Controls, pdf p. 33, "Brandenburg will perform additional air monitoring at the perimeter of the BFC while demolition activities are being conducted. Additional information on air monitoring and constituents involved will be addressed in the [site specific Health and Safety Plan or] HASP." The HASP does not appear to be included in the Demolition Plan. Please provide the HASP for review of the air monitoring and the proposed constituents to be monitored when it is available.

9. The plan discusses PM10 monitoring, but does not specifically cover how dust will be kept from leaving the site or what will be done in the event particulates are observed leaving the site. Please provide more detail on these issues.

10. Section 10.3.2, Paint with Lead and other RCRA Metals, pdf p. 42, "Missouri Department of Natural Resources has determined that there are eight (8) heavy metals of concern in 40 CFR Part 261, Table 1 – Maximum Concentration of Contaminants for the Toxicity Characteristic… A summary of these findings is included as part of this Plan." The referenced summary table is 49 pages long but includes data for only 7 of the 8 metals. Why was lead data not included?

11. Section 10.3. 3, Beryllium Decontamination, pdf p. 43. The section on asbestos defines what constitutes asbestos contamination: "The Missouri Department of Natural Resources defines asbestos containing materials as any material or product which contains more than one percent (1%) asbestos." Please provide a definition for Section 10.3.3 of what constitutes Be contamination.

12. Section 10.3. 3, Beryllium Decontamination, pdf p. 43. Are there areas within the main building where Be surface contamination was encapsulated? If so, have these areas been identified and how will these areas be handled during demolition?

13. Section 10.3.3, Beryllium Decontamination, pdf p. 43, "The results of the Facility Environmental Assessment has designated areas where Brandenburg has found trace amounts of beryllium on building surfaces including but not limited to concrete, CMU, structural members, ferrous utilities, etc." Please explain what levels of "trace amounts" of beryllium will require remediation.

14. Section 10.3.3, Beryllium Decontamination, pdf p. 43, "Brandenburg will delineate areas in the field and install water management practices such as temporary berms and utility plugs to control water being generated. Brandenburg will decontaminate these surfaces by the use of manned pressure washers with non-potable water and if necessary detergent, and collect the wash water." Please provide a detailed procedure on how wash water will be fully contained and collected for the benefit of both field workers and regulatory oversight.

15. Pdf pages 44 and 45, "Mercury light bulbs: These materials will be removed from the light fixtures intact and placed into DOT approved cardboard containers and labeled with the appropriate DOT and EPA labels. The hazard description for the materials will be RQ Mercury contained in manufactured articles 8, UN2809, PGIII." And "Mercury Switches / other items: HID bulbs: These materials will be removed from the light fixtures intact and placed into DOT approved cardboard containers, and labeled with the appropriate DOT and EPA labels. The hazard description for the materials will be RQ Mercury contained in manufactured articles 8, UN2809, PGIII." These sections are incomplete because they do not include any procedures for how the mercury will be handled if any of the bulbs or switches are broken. Hg is a serious health hazard. Please add the procedures for remediation and protection of workers in the event of broken bulbs and switches.

16. Section 10.3.6.2 Containment for Line-Breaks and Other Activities Where Liquids Are Handled, pdf p. 46, "Primary containment and capture of fluids generated during line breaking will be by buckets or drain pans." Since the liquids are presumed hazardous and the volume and pressure are unknown, are "buckets or drain pans" a sufficiently conservative collection method to avoid spilling hazardous materials?

17. Section 12.0, Site Grading, pdf p. 72, "Final inspection of the site by Jackson County will be coordinated by Brandenburg before removal of erosion and sediment control provisions." Please correct this sentence to read "Final inspection of the site by the City of Kansas City…"

18. Untitled table, pdf p. 127. Please explain why asphalt is tallied in square feet rather than weight or volume.

19. Section 1.2, Clarifications, pdf p. 131. The only types of waste listed in this section are U-listed wastes. Please cover F-listed wastes in this section also.

20. Section 2.2 Chemical Residual, pdf p. 134. Please provide a section on storage time and pre-transport requirements for hazardous waste.

21. Section 2.2 Chemical Residual, pdf p. 134. Please provide information on who will make determinations of whether residual chemicals are hazardous.

22. Section 2.2 Chemical Residual, pdf p. 134. Please note in this section that process chemicals found without a clear origin must receive a HW determination as well.

23. Section 2.8, Demolitions Debris, pdf p. 138, "Samples were collected from these materials *both* in areas where there was evidence of impact…" Please identify the two areas mentioned.

24. 3.1 BUILDING MATERIAL CHARACTERIZATION, pdf p. 192, "As outlined in the *FEA Work Plan*, samples were analyzed for different parameters based on field observation, sample location, and sample materials." The Department was not provided a copy of the FEA Work Plan and therefore does not know what was sampled for or how it was sampled. Please provide a list of all of the analytes sampled for in building materials in addition to PCBs and 8 metals.

25. 3.1 Table 1: Summary of TCLP Exceedances, pdf p. 193, In the column labeled "Sample Media" the term "hardfill" is first used and is used in a number of tables thereafter. Please define "hardfill".

26. Pdf p. 228, "Required Notifications: Dependent upon the results of the Engineering Survey, certain regulatory agencies may need to be notified. For example, notification is typically required when asbestos or underground tanks are being removed. Written plans may be required for storm water run-off or for other site conditions anticipated." This section needs to specify the notifications and written plans required for the referenced conditions that may occur. Workers in the field cannot use this document as written to know when notifications and written plans are required.

27. Pdf p. 236, "Searches of Persons and/or Property. Brandenburg and/or the customer reserve the right for the search of person and/or property of Brandenburg employees and subcontractor(s), vendors and visitors while on Brandenburg or customer property". Department regulatory personnel will not be subject to search. Please rewrite this section to make this clear.

28. Blasting and the use of Explosives 7/23/21012 3.18 Safety, pdf p. 357. What blasting is planned for this project? If blasting is proposed to be used for this project, please provide additional information on these activities.

29. Commercial Diving Operations 7/23/2012 3.25 Safety, pdf p. 379. If Commercial Diving Operations are intended to be used at this site, please provide additional information on these activities.

30. ATTACHMENT 2: BRANDENBURG SAFETY POLICY AND STANDARD OPERATING PROCEDURE MANUAL, Please add a section on Beryllium Safety.

31. Pdf p. 491, Please correct heading from "Butadine" to "Butadiene".

32. SWPPP Sediment Pond Specifications pdf p.575, The maximum storage volume of the sediment basins is less than the volume calculated for runoff from the drainage area due to a 2 year storm event. Please explain the difference in the two volumes. Please also discuss the potential for siltation, in the basins, which would reduce the volume they could hold, and how it will be handled.

Brandenburg® Industrial Service Company
2625 S. Loomis
Chicago, IL 60608
Phone (312) 326-5800
FAX (312) 326-5055

Brandenburg®

www.Brandenburg.com

BRANDENBURG RESPONSE TO MISSOURI DEPARTMENT OF NATURAL RESOURCES COMMENTS DATED MARCH 1, 2016

1. Remediation activities regarding the building structures are included as part of this Plan; this includes asbestos, paint, PCBs, universal and hazardous wastes, etc.

2. Additional plans are not expected to be prepared. This plan provides the guidelines for the personnel to utilize during the remediation and demolition process. The Brandenburg personnel have extensive experience and expertise in the fields of demolition and environmental remediation and regulatory requirements for this project including those on brownfield and Superfund type projects. If any changes to the plan or work performed at the site affect any regulatory requirements, notifications will be made to the appropriated agencies in accordance with their permit requirements. It is expected that there will be regular communications with DNR throughout the project to address any of these issues.

3. If any changes to the plan affect any regulatory requirements, notifications will be made to the appropriated agencies in accordance with their permit requirements. It is expected that there will be regular communications with DNR throughout the project to address any of these issues.

4. Section 3.0 “Regulatory Requirements” outline regulatory permitting and the NESHAP federal regulation as part of the general demolition and building remediation process. As stated in Paragraph 1 of Section 3.1 “.....Permits include but are not limited to the following....” This section is not intended to be exhaustive to allow the dynamic nature of this project in the event additional regulatory requirements are altered or approved after submittal and during the demolition and remediation process. In addition, pdf P. 132 Section 1.3: *Applicable Regulations, Requirements and Guidance* outlines additional federal, state, and local regulations that are potentially applicable to the BFC.

5. This will be implemented.

6. As referenced in Section 3.3 paragraph 1 on pdf P. 20, Brandenburg recognizes the hazardous waste management facility permit and Missouri state operating permit will transfer to the new owner/operator and stay with the Bannister Federal Complex.

7. As demolition progresses, Brandenburg will make a reasonable effort to protect the monitoring wells **in the event** they need to be accessed prior to the main structural demolition; however, the monitoring wells will be replaced based in a phased manner based upon demolition activities and foundation removal as detailed in the plans created by SS Papadopulos. This comment in the work plan is intended to reference any movement, altering, or protection of the wells prior to their proposed phased movement or after installation in their new location. We can add in the information referencing 10 CSR 23-4 if needed.

Brandenburg® Industrial Service Company
2625 S. Loomis
Chicago, IL 60608
Phone (312) 326-5800
FAX (312) 326-5055

8. HASP and air monitoring plan have been submitted separately and are available on CenterPoint's extranet.

9. Dust control measures are outlined in Section 3.2 pdf P. 20, and Section 10.1.5 pdf P. 32.

10. Lead data was completed during a separate portion of the investigation and co-located with Brandenburg samples for the additional 7 RCRA metals. Please reference NNSA-Environmental Assessment-Final Report-8-11-15 for the results of the lead samples.

11. As outlined in Table 3 of Attachment 1: *Bannister Federal Complex Facility Environmental Assessment* (pdf P. 201), Brandenburg has outlined any sampling locations where a detectable amount (>.1 mg/kg) of beryllium was found. These areas will be remediated and classified as beryllium contaminated.

12. As outlined in Table 3 of Attachment 1: *Bannister Federal Complex Facility Environmental Assessment* (pdf P. 201), Brandenburg has outlined any sampling locations where a detectable amount of beryllium was found, including areas where beryllium surface contamination was encapsulated. These areas will be remediated and classified as beryllium contaminated. It is unknown if any areas were specifically encapsulated within the facility, however, no areas were noticed, observed, or labeled as such. In addition, Brandenburg will be performing perimeter air monitoring to show that airborne levels of beryllium are not leaving the site.

13. Please see response to Comment 11.

14. Exact methods for the containment and collection of the wash water generated during the decontamination will be determined in the field by the Superintendent and foreman as dictated by final conditions in the work area. The methods mentioned within this section are some, but not all, of the options available for the supervisors to utilize to create the safe and efficient collection of the wash water. Once collected from the work area, wash water will be containerized in onsite temporary tanks with secondary containment and analyzed for disposal requirements. Depending on these analyses, disposal will occur at locations outlined on pdf P 161.

15. Spill controls, countermeasures, and remediation are outlined within the Demolition Plan and will be followed during handling of the mercury-containing equipment referenced. Furthermore, the methodology and protection of workers is covered under the Health and Safety Plan and all OSHA regulations will be followed while handling any mercury containing items or other contaminated materials.

16. Brandenburg will not be completing line-breaks on "pressurized" equipment. Brandenburg will implement a number of Standard Operating Procedures outlined

Brandenburg® Industrial Service Company
2625 S. Loomis
Chicago, IL 60608
Phone (312) 326-5800
FAX (312) 326-5055

in Attachment 2 to verify a zero-energy state of all utilities and process lines, including but not limited to 3.02 – Lock Out – Tag Out and 3.14 – Line Breaking so that only residual material in the line or equipment will remain. Buckets or drain pans may be various in sizes and will be appropriate to the amount of residual in the line or equipment prior to a line break.

17. This correction will be implemented.

18. Asphalt is generally quantified in accordance with the DOT, which measures it in terms of square feet or square yards.

19. This will be implemented; see pdf P. 132.

20. Storage times for hazardous waste are outlined on pdf p. 159 paragraph 1

21. Brandenburg will evaluate the material and send to a 3rd party lab for analyses if necessary to make this determination.

22. A reference to process wastes will be included.

23. The entirety of the paragraph reads as follows: "Material destined to become demolition debris was sampled and characterized as part of the FEA. The FEA focused on characterizing concrete, CMU, acid brick, and structural facing brick. Samples were collected from these materials both in areas where there was evidence of impact (staining, pitting, odors, etc) as well as from random locations selected to characterize materials with no obvious chemical impact..." The MDNR comment referencing the word *both* does not indicate two areas as stated by MDNR, rather the word *both* in this phrase explains that samples were taken in areas where there was evidence of impact and random locations.

24. The FEA work plan is available on the CenterPoint extranet. In addition, all sample results were included in the FEA.

25. Hardfill utilized in this plan is defined as any building material that may be used for below-grade fill, such as concrete, CMU, acid brick, and structural facing brick.

26. Workers in the field will not be completing notifications and written plans referenced in this comment. Brandenburg Administrators, Project Management and/or Executives are knowledgeable with these referenced notifications and written plans and will be completed in accordance with all federal, state, and local regulations.

27. Department regulatory personnel will not be subject to search, we can adjust the plan to read as such. However, department regulatory personnel will be required to follow the remainder of the Security Safety Policy and Procedure so as not to create a security concern for the project along with the site Health and Safety Requirements.

Brandenburg® Industrial Service Company
2625 S. Loomis
Chicago, IL 60608
Phone (312) 326-5800
FAX (312) 326-5055

28. Blasting and the use of Explosives are not anticipated to be used at this project. These are included as it is a part of our Standard Operating Procedures – all of which were included whether to be utilized on this project or not.

29. Commercial Diving is not anticipated to be used at this project. These are included as it is a part of our Standard Operating Procedures – all of which were included whether to be utilized on this project or not.

30. Attachment 2 is a company-wide Standard Operating Procedure to be implemented to this site: it is not a site-specific Standard Operating Procedure manual and therefore will not include a section on Beryllium Safety. A site Health and Safety Plan will be developed prior to mobilization that will describe project hazards and worker safety. In addition, a pre-task analysis will be completed by Brandenburg for internal use only that will outline specific means and methods and worker safety prior to the start of work.

31. This correction will be implemented; see pdf P. 491.

32. Regarding the two volumes referenced: the tables provided in the Sediment Basin plan sheets include a storage table and a routing table. The stage vs. storage table depicts the cumulative storage capacity within the proposed basin area for a given elevation (using 2' vertical increments). The routing summary tables do depict greater *cumulative* runoff volumes for each design storm event than the *maximum storage* volume. This is the result of the outfall structure discharging continuously during the design precipitation event. The objective of providing capacity for the 2-year design storm below the overflow weir within the proposed Field Inlet is met in the current plans based upon the assumption of the skimmer assembly discharge in operation. Should there be a reason to prohibit any discharge from the basin outlet, the gate valve will be shut, and the stormwater will remain within the facility. The elevation of the Inlet Box overflow weir is currently set at the elevation that would contain the maximum storage volume of the 2-year design storm with the skimmer assemble in operation throughout the precipitation event.

    Regarding the comment "Please also discuss the potential for siltation, in the basins, which would reduce the volume they could hold, and how it will be handled": the proposed basins will incorporate a graduated stake with the appropriate elevation delineated for the maximum allowable sediment level. Once collected sediment achieves this elevation, the basin shall have the sediment removed from the basin storage area following approved disposal methods. Please note that, unlike typical sediment basins, these facilities are currently anticipated to include an impermeable liner. Therefore, the grade stake should either be prominently mounted to the leading face of the proposed Inlet Box, or placed within a concrete base (pedestal) that will sit upon the bottom of the facility, eliminating the potential penetration of the impermeable basin liner and flotation of the stake assembly. The (maximum) appropriate elevation for sediment removal is

Brandenburg® Industrial Service Company
2625 S. Loomis
Chicago, IL 60608
Phone (312) 326-5800
FAX (312) 326-5055

the point at which collected sediment is at the top of the first baffle within a given basin. An additional indication of the appropriate time for sediment removal is exhibited when sediment accumulates around the articulating arm of the skimmer assembly, preventing the ability to fully drain the basin.

An updated plan (no change to drawing portion, but the correct table in included) will replace the existing drawing.

NNSA Review Comments on Brandenburg's Bannister Federal Complex Demolition Plan (December 2015 Edition)

- NNSA Comment #1: **Demolition Plan Section 6.3 On Site Security** (page 18 of 613). This section confirms Brandenburg's plan for providing dedicated security personnel during nonwork hours. Please confirm CenterPoint LLC's (CP's) security plan for the demolition and remediation program. Specifically, NNSA is interested in understanding the security guard schedule in terms of the hours per day/days per week during which security will be provided, the number of shifts per day, and the number of guards per shift. This comment has been addressed; see Section 6.3 for revision.
- NNSA Comment #2: **Demolition Plan Section 7.0 Areas to be Demolished** (page 20 of 613). The drawing presented at the bottom of the referenced page shows that the area associated with the existing Kansas City Power and Light (KCP&L) Electrical Switchyard positioned along the western edge of the BFC is an "Excluded Work Area." Please confirm that no activities are anticipated to be performed within the KCP&L Electrical Switchyard that the ECMS team should include in our independent government cost estimate (IGCE). Is CP planning a road construction through the area of the existing electrical switchyard? No activities are anticipated within this area by CP; however, KCP&L may need access to this area as this is currently controlled by the Utility; see Section 8.0 for revision.
- NNSA Comment #3: **Demolition Plan Section 9.1 Wastewater Treatment Operations** (page 22 of 613) compared to **Waste Operations Manual Section 5.11 Water** (page 148 of 613). NNSA has identified a discrepancy between these two sections of the document. NNSA requests CP to confirm which wastewater/rinse water streams are to be routed to the onsite wastewater treatment plant for treatment and which wastewater/rinse water streams are to be transported offsite for treatment/disposal. This has been addressed; see Section 9.1 and Section 5.11.3 respectively for revision.
  - **Demolition Plan Section 9.1** reads as follows:
    The wastewater treatment plant will not be used to treat sanitary wastes generated during the demolition protect or to treat wastewaters or rinse waters generated during the decontamination or demolition activities.
  - **Waste Operations Manual Section 5.11** indicates that the wastewater treatment plant will be used to treat certain wastewater and/or rinse water streams generated during the decontamination or demolition activities.
- NNSA Comment #4: **Demolition Plan Section 10.1.4 Bicron Radiation Detection System** (page 24 of 613). NNSA requests CP to confirm the number of Bicron Radiation Systems the ECMS team should assume to include in our IGCE. Section 10.1.4 indicates that CP intends to install a Bicron system near the site truck exit. Is CP planning to install a second Bicron station to support rail car screening? Yes; see Section 10.1.4 for revision

- NNSA Comment #5: **Demolition Plan Section 10.3.7 Above Grade Impacted Concrete, Brick, CMU** (page 38 of 613). NNSA interprets Section 10.3.7 to illustrate CP's plans to dispose of the entire concrete slab, concrete footings, and the hardfill east wall of Department 26 as remediation waste with PCB concentrations exceeding 50 mg/kg. NNSA questions the basis for this volume determination. The PCB-impacted concrete sample analytical testing results presented in the Brandenburg Facility Environmental Assessment (FEA) does not appear to support this assumed volume. Please provide the basis for assuming this volume of concrete associated with Department 26 exceeding PCB concentrations of 50 mg/kg. According to information provided by the NNSA, uncontrolled releases occurred throughout operation of the BFC within the footprint of Department 26. Due to the porous nature of concrete, PCB-containing oil has migrated through the slab and into the soil below this footprint creating a Solid Waste Management Unit. FEA results of this contaminated concrete indicated higher levels of contamination as sample locations were deeper (See Concrete Sample locations on the southern half of Department 26 and Sample locations within old equipment pits). Factoring the limit of safe sampling efforts and the potential for foundation undermining, along with significant increases in attempting to selectively demolish this area, Brandenburg has interpreted this sample information to indicate a PCB contamination concentrations in excess of 50 mg/kg.

- NNSA Comment #6: **Demolition Plan Section 10.3.7.3 NNSA Building Roof 1** (page 48 of 613). Section 10.3.7.3 indicates that CP is planning to transport the entire roof structure associated with the main manufacturing building offsite for disposal because the roofing membrane and mastic contain low levels of PCBs. NNSA believes that this approach will prove fiscally impracticable because it will generate a massive volume of material for offsite disposal. NNSA recommends CP continue to identify viable options for the disposition of Building 1 roofing material. NNSA recommends that CP consider adopting a plan to segregate an appropriate portion of the Bannister Facility to house low-level PCB bulk product wastes under institutional control measure implementation scenarios available under the Toxic Substances Control Act (TSCA), assuming such approach would be acceptable to the Missouri Department of Natural Resources (MDNR). If CP were to follow these NNSA recommendations, other than concrete all layers of the roofing material (mastic, flashing, asphaltic roofing, foam, etc) will need to be removed prior to demolition in order to facilitate the crushing operations on site. Attempting to segregate the roofing material from the concrete would not prove cost-effective when compared to vertical demolition and disposal. Further information on this will be provided in Brandenburg's Final Cost Proposal.

- NNSA Comment #7: **Demolition Plan Section 11.7.1 Site Utility Contaminated Soil** (page 62 of 613). Section 11.7.1 suggests that impacted soil generated during the site utility excavation program will be automatically scheduled for offsite transport and disposal. NNSA recommends that, when impacted soils are encountered, CP consider comparing the soil quality against appropriate soil cleanup goals to evaluate potential reuse as backfill onsite as a cost savings measure for the project.

  Following NNSA recommendations would negatively impact project scheduling and sequencing and would not prove beneficial as a cost savings measure.

NNSA Comment #8: **Demolition Plan Section 11.7.2 Site Utility Contaminated Bedding** (page 62 of 613). Section 11.7.2 indicates that impacted bedding soil generated during the site utility excavation program will be automatically scheduled for offsite transport and disposal. NNSA recommends that, when impacted soils are encountered, CP consider comparing the soil quality against appropriate soil cleanup goals to evaluate potential reuse as backfill onsite as a cost savings measure for the project. Following NNSA recommendations would negatively impact project scheduling and sequencing and would not prove beneficial as a cost savings measure.

- NNSA Comment #9: **Demolition Plan Section 11.9 Backfilling Excavations** (page 63 of 613) – This section states, *In no instance will backfill material be obtained from a designated grading zone other than the grading zone in which the backfill work is being performed*. Why is this condition stipulated? NNSA believes CP should be able to mix and match material throughout Bannister property, provided that backfill material constituent concentrations do not exceed soil remediation goals established for the particular area in which the backfill is placed. This comment has been addressed; see Section 11.9 for revision.
- NNSA Comment #10: **Demolition Plan Non-contaminated Materials to be Recycled Summary Table** (page 119 of 613). Does the quantity for masonry/block presented in the summary table include brick? Is CP planning to crush building brick for reuse as onsite fill materials? Yes; yes
- NNSA Comment #11: **Demolition Plan Utility Excavation Summary Table** (page 121 of 613) – What criteria were used to classify hazardous volume vs. nonhazardous volume vs. reuse volume for the utility material backfill quantities summarized in this table? Were these materials classified on the basis of toxicity characteristic leaching procedure (TCLP) testing or on the basis of total concentrations analysis? If materials were classified on the basis of total concentrations analysis, what assumptions were applied in support of quantifying volumes of materials classified as hazardous in the summary table? Regarding utilities, an 18" circumference was graphically developed to show a cross-section of the average volume of soil around the utility. Because of the nature of the contamination in the utility based on information from NNSA, the bottom 1/3 of this volume was calculated. This selective 1/3 volume was further broken down into three further volumes: 1/3 – hazardous waste; 1/3 - non-hazardous waste; 1/3 – reuse.
- NNSA Comment #12: **Waste Operations Manual Section 3.1 Asbestos** (page 135 of 613). This section of the document identifies CP's plans to transport concrete masonry unit (CMU) block wall filled with vermiculite material containing asbestos at concentrations greater than 1% for offsite disposal as asbestos-containing material (ACM) waste. NNSA is requesting clarification of the associated volume of these ACM wastes that CP anticipates will be generated during the facility demolition program. This comment has been addressed: as it was not encountered, discussions of vermiculite has been removed; see Section 3.1 for revision.
- NNSA Comment #13: **Waste Operations Manual Section 3.5.4 Inert** (page 139 of 613). This section of the document stipulates the following:

Soil or sediment which does not contain PCBs, does not exhibit the characteristic of toxicity, and does not contain a listed hazardous constituent will be considered nonhazardous waste. Soil or sediment characterized as non-hazardous waste may be further classified as inert, based on comparison of analytical data to Missouri Department of Natural Resources Solid Waste Program Risk-based Target Levels.

Which Tier 1 target levels does CP intend to employ for this analysis? For what type of soil? If CP intends to employ Tier 1 target levels other than those published for nonresidential / construction worker scenarios, what is CP's basis for exposure scenario selection? NNSA suggests CP consider using Baseline Risk Assessment (BRA) established site-wide remediation goals as the beneficial reuse criteria. To maximize the quantity of soil and sediment that can be re-used as backfill onsite, NNSA suggests that CP consider the use of synthetic precipitation leaching procedure (SPLP) testing results compared to the maximum contaminant level (MCL) in conjunction with the BRA remediation goal total concentration testing results to decide which demolition materials meet criteria for beneficial reuse. Specific clean-up levels will be determined based off of the Corrective Measures Study generated by S.S. Papadopulos and Associates.

- NNSA Comment #14: **Waste Operations Manual Section 8 Documentation and Reporting** (page 154 of 613). What documentation method does CP intend to implement to document and track the quantity of materials (by material stream) transported offsite for recycling/resale/salvage? Brandenburg will incorporate a tracked Bill of Lading system to document and internally track all recycling/resale/salvage items.
- NNSA Comment #15: **Attachment 3 Figures, SWPPP Sediment Pond Specifications (page 568 of 613 through page 588 of 613).** NNSA does not understand how CP's Phase 1 Stormwater Pollution Prevention Plan (SWPPP) efforts presented in Attachment 3: Drawing 4 of 20 and CP's Phase 2 SWPPP efforts presented in Attachment 3: Drawing 16 of 20, coordinate with CP's vertical demolition sequence plan presented in Section 11.6 of the Demolition Plan (page 61 of 613). It appears that several buildings and site features within the footprints of SWPPP Phase 1 and/or SWPPP Phase 2 sediment pond construction are later phased in the Vertical Demolition Sequence. NNSA requests CP to clarify the overall site development program and sequencing. This has been addressed; see Section 10.1.3 of the Demolition Work Plan for revision.
- NNSA Comment #16: **Demolition Plan Section 3.3 (page 12 of 613).** This section references existing permits that would be in effect during demolition. This is not the case. The existing permits will all either transfer or be replaced by new permits issued to the new owner. However, if there is a desire to list the existing permits that apply at the BFC, the references provided are incorrect. The RCRA Part B permit should be revised to a Missouri Hazardous Waste Management Facility Part B Permit. The NPDES permit should be revised to name it as the Missouri State Operating Permit. The KCMO wastewater discharge permit is dated 6/27/2014 and does not contain stormwater provisions indicated in the sub-bullets. Finally, the "KCMO State Stormwater Permit" is not applicable to the BFC. This has been addressed; see Section 3.3 for revision.

- NNSA Comment #17: **Demolition Plan Section 4.6 (page 14 and page 15 of 613).** This section indicates that the NNSA's SPCC plan will be used at the site to define the measures taken by Brandenburg to prevent and respond to spills to the stormwater system. This is not accurate. The new permittee will be responsible for developing the plan. It would be more appropriate for the draft plan to be incorporated or referenced in this section. This has been addressed; see Section 4.6 for revision.
- NNSA Comment #18: **Demolition Plan Section 5.1 (page 16 and 17 of 613).** There is a discussion regarding treatment filter units in the sediment basins. Unless there have been changes, the stretch of Indian Creek and the Blue River surrounding the BFC are Metropolitan No Discharge Streams. This means that treatment systems are not allowed to discharge to the portions of the stream with this designation. Has the use of these treatment units been evaluated against the restrictions of the stream designation? It is our intent that this system will be utilized as a last/final effort for stormwater management. No wastes are being sent through this system; only discharges are those allowed through the stormwater permitting. This position will be discussed and verified with MoDNR in upcoming meetings.
- NNSA Comment #19: **Demolition Plan Section 6.2 (page 18 of 613).** This section indicates that existing warning signs on fencing may be used to warn the public to stay out. The existing warning signs on fencing must be removed as it refers to laws that are applicable only to Federal owned properties. Remove the option of using the existing signage. This comment has been addressed; see Section 6.2.
- NNSA Comment #20: **Demolition Plan Section 8 (page 20 of 613).** Reference is made to the Traffic Control Plan to identify rail storage areas. NNSA could not find these areas designated in the Traffic Control Plan. Please clarify rail storage areas in the Demolition Plan final submittal. Final placement of the rail switch and system to be installed is still to-be-determined; Section 5.1 of the Demolition Plan describes a potential location being in the southeast region of the work area.
- NNSA Comment #21: **Demolition Plan Section 9.1 (page 21 of 613).** The paragraph indicates that the IWPF will need to remain operational to treat process waters. Later in the paragraph it states that the IWPF will not be used to treat any wastewaters from demolition. There needs to be a distinction made between the IWPF and the groundwater treatment system (GTS) that is housed within the IWPF so that it is clear that power is needed in the building to support the GTS and not the IW treatment process. This comment has been addressed; See Section 9.1 for revision.
- NNSA Comment #22: **Demolition Plan Section 10.3.3 (page 35 of 613).** Paragraph states that the IWPF will be used to treat beryllium wastewater. This conflicts with the statement on page 21.

  This comment is inaccurate. There is no language that explicitly states the IWPF will be used to treat beryllium wastewater. In paragraph 4, the statement "If the wash water cannot be treated below discharge levels at the onsite Waste Water Treatment Plant, it will be transported and disposed of offsite" indicates that wash water will be disposed of offsite if parameters indicate it cannot be treated below discharge levels onsite.

- NNSA Comment #23: **Demolition Plan Section 10.3.4 (page 35 of 613).** It is unclear why fire hoses are listed as universal or regulated waste on FEA Table 4 (see comment below). If they are appropriately listed, there is no discussion about their handling. Fire hoses could not be sampled for asbestos due to the existing site conditions at the BFC. Therefore, fire hoses are considered a presumed-asbestos containing material and may be removed per the Asbestos Standard Operating Procedure listed in Attachment 2.
- NNSA Comment #24: **Demolition Plan Section 11.7.3 (page 62 of 613).** The paragraph states that UST use at the BFC was ongoing until the recent relocation of operations. The implication is that the USTs were all abandoned in place. This is a minor point, but that is inaccurate. UST use was phased out decades ago and in accordance with regulatory timelines, and the majority of USTs were removed per State requirements. This comment has been addressed; see Section 11.7.3 for revision.
- NNSA Comment #25: **Material Quantity Table (page 119 of 613).** The Asphalt quantity is missing a digit. This comment has been addressed; see Material Quantity Table for revision.
- NNSA Comment #26: **Waste Operations Plan Section 1.3 (page 124 of 613).** Change the "National Pollutant Discharge Elimination System" to "Missouri State Operating". This comment has been addressed; see Section 1.3 for revision.
- NNSA Comment #27: **Waste Operations Plan Section 2 (page 126 of 613).** No specific mention of abandoned personal property such as mills, presses, CMMs, laser welders, or fume hoods. It is unclear to NNSA if this demo plan addresses the abandoned personal property or, if included, what assumptions were used regarding the types and volumes of abandoned equipment. Facility evaluations regarding abandoned personal property were completed as of March 2015 – this is indicated in the Facility Environmental Assessment and will be further described within demolition pricing deliverables to be completed in 2016. Any changes in these items will not be accounted for after March 2015 as initial CP Scope of Work was not based on a facility change in conditions. An evaluation of abandoned personal property such as the items listed above can be completed at an additional cost to NNSA with a resulting impact in schedule.
- NNSA Comment #28: **Waste Operations Plan Section 6.4 (page 150 of 613).** The discussion incorrectly identifies the BFC currently as a small quantity generator. The BFC is currently a large quantity generator. If it is the intent for the post-transfer site to be a SQG then it should be revised to indicate that the SQG status is post-transfer. This has been addressed; see Section 6.4 for revision.
- NNSA Comment #29: **Traffic Control Plan Section 5.1 (page 169 of 613).** The path from Troost to the Legacy East gate is not indicated on Figure 1 as described. This has been addressed; see Section 5.1 for revision.
- NNSA Comment #30: **Traffic Control Plan Page 174 of 613.** There appears to be a document pagination issue after this page of the Traffic Control Plan. This has been addressed.
- NNSA Comment #31: **Traffic Control Plan Section 12 (page 169 of 613).** This section of the Traffic Plan directs the reader to the Waste Operations Manual for information concerning

transportation of waste. Beyond information on sample manifests, NNSA could find no information on waste transportation procedures. What additional information is NNSA requesting? The following sections within the Waste Operations Manual describe details in the waste transportation procedures:

- 1.3 APPLICABLE REGULATIONS, REQUIREMENTS, AND GUIDANCE
  - This section specifically lists applicable regulations THAT WILL BE FOLLOWED for waste transportation, including but not limited to:
    - "49 CFR Parts 172 and 173: federal regulations concerning the preparation of hazardous materials for shipment, including marking, labeling, and placarding of containers; and shipping papers."
    - "10 CSR 25-6.263 – Standards for Transporters of Hazardous Waste"
  - These applicable regulations clearly describe in detail waste transportation procedures; rather than attempting to create a new procedure that would require additional regulatory approval, CP will utilize these regulations as procedures for waste transportation.

- Furthermore, the Traffic Control Plan outlines steps in the waste transportation process; to avoid confusion in this, Section 12 of this Plan has been removed.

- NNSA Comment #32: **Facility Environmental Assessment Table 4 (page 196 of 613).** Cubical lighting fluorescent bulb count will need to be revised depending on final removal totals by the office furniture buyer. Facility evaluations regarding lighting fixtures were completed as of March 2015 – this is indicated in the Facility Environmental Assessment and will be further described within demolition pricing deliverables to be completed in 2016. Any changes in these items will NOT be accounted for after March 2015 as initial CP Scope of Work was not based on a facility change in conditions. An evaluation of abandoned personal property such as the items listed above can be completed at an additional cost to NNSA with a resulting impact in schedule.

- NNSA Comment #33: **Facility Environmental Assessment Table 4 (page 196 of 613).** Unclear why nitrogen tanks and fire hoses are on this list. NNSA is not aware of the regulation that would cause them to be on the list. Please clarify. The potential for further decommissioning of nitrogen tanks exists due to the potential occupational hazard associated with nitrogen gas. Fire hoses could not be sampled for asbestos due to the existing site conditions at the BFC. Therefore, fire hoses are considered a presumed-asbestos containing material and may be removed per the Asbestos Standard Operating Procedure listed in Attachment 2.

- NNSA Comment #34: **Facility Environmental Assessment Table 4 (page 196 of 613).** There are many walk-in ovens slated for removal this year. This total may need to be revised. Facility evaluations regarding walk-in ovens were completed as of March 2015 – this is indicated in the Facility Environmental Assessment and will be further described within demolition pricing

deliverables to be completed in 2016. Any changes in these items will NOT be accounted for after March 2015 as initial CP Scope of Work was not based on a facility change in conditions. An evaluation of abandoned personal property such as the items listed above can be completed at an additional cost to NNSA with a resulting impact in schedule.

- NNSA Comment #35: **Attachment 2 Safety Policy and Standard Operating Procedure Manual (page 197 of 613).** As none of the procedures or policies included in Attachment 2 has been revised to reflect site-specific conditions or needs, no comments are offered on this. As there is no comment offered, please remove Comment #35.
- NNSA Comment #35: Please include a Demolition Project Schedule within the Demolition Plan. This is a separate deliverable and will not be included in the Demolition Plan. A Demolition Project Schedule will be submitted for review according to the CP Schedule with a delivery in February of 2016.

Brandenburg® Industrial Service Company
2625 S. Loomis
Chicago, IL 60608
Phone (312) 326-5800
FAX (312) 326-5055

Brandenburg®

www.Brandenburg.com

BANNISTER FEDERAL COMPLEX
DEMOLITION PLAN

Brandenburg® Industrial Service Company

2625 South Loomis Street
Chicago, IL 60608
Phone (312) 326-5800
Fax (312) 362-5055
www.brandenburg.com

Brandenburg®

TABLE OF CONTENTS

1.0 Introduction

DEMOLITION WORK PLAN

1.0 Introduction
2.0 Background
3.0 Regulatory Requirements
  3.1 Permits
  3.2 NESHAPs
  3.3 Compliance with Existing Permits
4.0 Integration with Other Work Plans
  4.1 Health and Safety Plan
  4.2 RCRA Corrective Measures Plan
  4.3 Waste Operations Manual
  4.4 Traffic Control Plan
  4.5 Storm Water Pollution Prevention Plan (SWPPP)
  4.6 Spill Prevention Control and Countermeasure Plan (SPCC)
5.0 Mobilization and Pre-demolition Activities
  5.1 Temporary Facilities and Utilities
  5.2 Equipment and Materials
6.0 Security Operations
  6.1 Sign-in and Tracking Procedures
  6.2 Perimeter Security Fencing and Installation of Signage to Prevent Unauthorized Entry
  6.3 On Site Security
  6.4 Report of Security Related Incidents
7.0 Areas to be Demolished
8.0 Areas to be Protected
9.0 Ongoing Operations
  9.1 Wastewater Treatment Operations
10.0 10. General Information and Procedures
  10.1 Temporary Facilities/Utilities and Installations Required to Conduct the Work
    10.1.1 Temporary Power
    10.1.2 Temporary Water
    10.1.3 Storm Water Pollution Prevention Plan (SWPPP)
    10.1.4 Bicron Radiation Detection System
    10.1.5 Environmental Controls
    10.1.6 Surface Water Control
  10.2 Sequencing Demolition to Minimize Contaminated Material Storage
  10.3 Hazardous and/or Environmentally Impacted Removal
    10.3.1 Asbestos
    10.3.2 Paint with Lead and other RCRA Metals
    10.3.3 Beryllium Decontamination
    10.3.4 Universal Waste
    10.3.5 Hazardous Waste Sludge
    10.3.6 Residual Removal, Characterization, and Disposal
      10.3.6.1 Line Breaking
      10.3.6.2 Containment for Line-Breaks and Other Activities Where Liquids Are Handled
      10.3.6.3 Spill Containment and Cleanup Procedures and Supplies

2625 South Loomis Street
Chicago, IL 60608
Phone (312) 326-5800
Fax (312) 362-5055
www.brandenburg.com

10.3.7 Above-grade Impacted Concrete, Brick, CMU
10.3.7.1 PCB Remediation Waste
10.3.7.2 PCB-impacted Material
10.3.7.3 NNSA Building 1 Roof
10.3.7.4 NNSA Building 1 Floor Slab
10.3.8 Elevator Piston and Casing
10.3.9 Radiation
10.4 Material Segregation and Handling
11.0 Vertical Demolition
11.1 Work Area Preparation
11.2 Demolition Equipment
11.3 Interior Demolition & Preparation
11.4 Structural Demolition
11.5 Material Segregation and Handling
11.6 Vertical Demolition Sequence
11.7 Site Utility Removal
11.7.1 Site Utility Contaminated Soil
11.7.2 Site Utility Contaminated Bedding
11.7.3 Underground Storage Tanks (USTs)
11.8 Identification of Impacted Soils for Removal
11.9 Backfilling Excavations
12.0 Site Grading
12.1 Clean Fill
12.2 Slope Requirements
12.3 Items to be Protected
13.0 Site Surveying
13.1 Site Surveying Requirements
13.2 Surveying of Disturbed Acreage
14.0 As-built Documentation
14.1 As-built Documentation
14.2 As-built Surveys
15.0 Demobilization
15.1 Removal of Equipment and Materials
15.2 Removal of Temporary Facilities and Materials
15.3 Cleaning of the Site
15.4 Site Maintenance
15.5 Required Documentation

RCRA HEAVY METAL SUMMARY
NON-CONTAMINATED MATERIALS TO BE RECYCLED/REUSED
UTILITY EXCAVATION SUMMARY

WASTE OPERATIONS MANUAL

1.0 Introduction
1.1 Objectives
1.2 Clarifications
1.3 Applicable Regulations, Requirements, and Guidance
1.4 Integration with Other Plans
2.0 Anticipated Waste Materials
2.1 Asbestos
2.2 Chemical Residual

2625 South Loomis Street
Chicago, IL 60608
Phone (312) 326-5800
Fax (312) 362-5055
www.brandenburg.com

2.3 Used Oil
2.3.1 Hazardous Waste and Suspected Hazardous Waste
2.3.2 PCB-Containing and Suspected PCB-Containing
2.3.3 Non-hazardous
2.4 Universal Waste
2.4.1 Batteries
2.4.2 Pesticides
2.4.3 Mercury-Containing Equipment
2.4.4 Lamps
2.5 Electronic Waste
2.6 Exit Signs
2.7 Ballasts
2.8 Demolition Debris
2.9 Scrap Metal
2.9.1 Clean Scrap Metal
2.9.2 Scrap Metal with Residue that is Non-hazardous Waste
2.9.3 Scrap Metal with Residue that is Hazardous Waste
2.10 Miscellaneous Recyclables
2.11 Suspect Soil and Sediment
2.12 Clearing and Grubbing Waste
2.13 Wastewater
2.14 Personal Protective Equipment
3.0 Waste Characterization and Analysis
3.1 Asbestos
3.2 Chemical Residual
3.3 Used Oil
3.3.1 PCB-Containing
3.3.2 Hazardous Waste
3.3.3 Non-hazardous Waste
3.4 Demolition Debris
3.4.1 PCB-Impacted
3.4.2 Hazardous Waste
3.4.3 Non-hazardous Waste
3.5 Soil and Sediment
3.5.1 PCB-Impacted
3.5.2 Hazardous Waste
3.5.3 Non-hazardous Waste
3.5.4 Inert
3.6 Wastewater
3.7 Personal Protective Equipment
4.0 Waste Sampling Procedures
4.1 Asbestos
4.2 Chemical Residual
4.3 Used Oil
4.4 Demolition Debris
4.5 Water
4.6 Sampling Tools Decontamination
4.7 Sample Shipment
5.0 Waste Containment and Labeling
5.1 Asbestos
5.2 Chemical Residual
5.3 Used Oil

2625 South Loomis Street
Chicago, IL 60608
Phone (312) 326-5800
Fax (312) 362-5055
www.brandenburg.com

5.4 Universal Waste
5.4.1 Batteries
5.4.2 Pesticides
5.4.3 Mercury-Containing Equipment
5.4.4 Lamps
5.5 Electronic Waste
5.6 Exit Signs
5.7 Ballasts
5.8 Demolition Debris
5.8.1 PCB-Impacted
5.8.2 Hazardous Waste
5.8.3 Non-hazardous Waste
5.8.4 Inert
5.9 Scrap Metal
5.9.1 Clean
5.9.2 Non-hazardous Waste Residue
5.9.3 Hazardous Waste Residue
5.10 Soil and Sediment
5.10.1 PCB-Impacted
5.10.2 Hazardous Waste
5.10.3 Non-hazardous Waste
5.10.4 Inert
5.11 Water
5.11.1 PCB-Impacted
5.11.2 Hazardous Waste
5.11.3 Non-hazardous Waste
5.11.4 Inert
5.12 Clearing and Grubbing Debris
5.13 Personal Protective Equipment
5.14 Labeling Requirements
6.0 Waste Accumulation
6.1 Wastewater Compatibility
6.2 Asbestos
6.3 Universal Wastes
6.4 PCB-Containing and Hazardous Wastes
6.5 Non-Hazardous Waste Solids
6.6 Non-Hazardous Waste Liquids
6.7 Inert Materials
6.8 Inspection of Accumulation Areas
6.9 Emergency Equipment and Procedures
7.0 Waste Disposal
8.0 Deocumentation and Reporting
8.1 Waste Inventory
8.2 Waste Profile/Waste Analysis
8.3 Waste Accumulation Area Inspection Checklists
8.4 Waste Manifests
8.5 Weight Tickets
8.6 Certificates of Disposal, Treatment, or Destruction
8.7 Reporting
8.7.1 RCRA Biennial Report
8.7.2 Change in RCRA Generator Status
8.7.3 Exception Report

2625 South Loomis Street
Chicago, IL 60608
Phone (312) 326-5800
Fax (312) 362-5055
www.brandenburg.com

8.7.4 Summary Report
9.0 Radiation

EXAMPLE WASTE MANIFESTS
EXAMPLE WASTE INVENTORY DOCUMENTATION

TRAFFIC CONTROL PLAN

1.0 Introduction
2.0 Regulatory Background
3.0 Integration with Related Work Plans
3.1 Demolition Work Plan
3.2 Waste Operations Manual
3.3 Health and Safety Plan
4.0 Protection of Area Residents and Local Roadways
5.0 Points of Entry and Exit
5.1 Entry and Exit Points for Contractors, Visitors, and Emergency Vehicles
5.2 Entry and Exit Point for All Truck Traffic
6.0 Parking Areas
6.1 Traffic Flow Procedures
7.0 Onsite Vehicle Traffic Control Measures
7.1 Required Documentation for Onsite Vehicles
7.2 Gasoline and Electric Powered Vehicles Inside the Plant
7.3 Diesel Fuel Powered Vehicles Inside the Plant
7.4 Internal Combustion Vehicles or Machinery
7.5 Stabilize Loads
7.6 Mobilize Equipment Backup Alarms
8.0 Pedestrial Traffic Control Measures
8.1 Crosswalks
8.2 Pedestrian Walkways
9.0 Rail & Rail Trafic Control Measures
9.1 Rail Car Movement
9.2 Rail Care Movement Worker Notification
10.0 Protection and Diversion of Pedestrian and Vehicular Traffic in Work Areas
10.1 Spotters
10.2 Erection of Barricades
10.3 Lighting
10.4 Erection and Maitenance of Signage
10.4.1 Danger Signs
10.4.2 Caution Signs
10.4.3 Exit Signs
10.4.4 Safety Instruction Signs
10.4.5 Directional Signs
10.4.6 Traffic Signs
11.0 Site Deliveries and Pickups
11.1 Delivery Procedures
11.2 Pickup Procedures

FIGURE 1: SITE VEHICLE TRAFFIC ROUTE
FIGURE 2: TRAFFIC FLOW PROCEDURES
FIGURE 3: PEDESTRIAL AND VEHICULAR TRAFFIC CONTROL SIGNAGE
FIGURE 4: TRUCK SCALE AND WASH WITH TRACK OUT PAD

Brandenburg® Industrial Service Company

2625 South Loomis Street
Chicago, IL 60608
Phone (312) 326-5800
Fax (312) 362-5055
www.brandenburg.com

Brandenburg®

ATTACHMENT 1: FACILITY ENVIRONMENTAL ASSESSMENT
ATTACHMENT 2: BRANDENBURG SAFETY POLICY AND STANDARD OPERATING PROCEDURE MANUAL
ATTACHMENT 3: FIGURES
- **SWPPP SEDIMENT POND SPECIFICATIONS**
- **SWPPP SEDIMENT POND WASTE TREATMENT SYSTEM & SPRUNG STRUCTURE SPECIFICATIONS**
- **VEHICLE RADATION DETECTION SYSTEM SPECIFICATIONS**

Brandenburg® Industrial Service Company
2625 S. Loomis
Chicago, IL 60608
Phone (312) 326-5800
FAX (312) 326-5055

1.0 INTRODUCTION

Brandenburg Industrial Service Company was contracted by CenterPoint Properties to complete a Demolition Plan for the Bannister Federal Complex (BFC) located at 1600 East Bannister Road in Kansas City, Missouri. The objective of this plan is to detail procedures for the safe and environmentally conscious remediation and demolition of the BFC while minimizing impact on the neighboring community. This document will also serve as a reference document for Brandenburg, CenterPoint, and CenterPoint Subcontractor personnel during demolition and remediation. As field conditions may change throughout this project, this multi-faceted Plan is dynamic and subject to revision at any time.

Based upon our conference call conversations, more detailed site-specific work plans will be prepared and submitted to the Regulators. All work plans require review and approval prior to transfer and prior to work commencing in the field. The following plans are expected to be expanded upon:

- Asbestos Abatement
- Beryllium removal
- Heavy metal containing paint removal
- PCB contaminated structure removal
- Hazardous sludge removal
- Mercury spill procedures
- Radiation alarm procedure and recommendations for monitoring and screening of demolition materials prior to leaving the site for disposal and/or to be crushed and re-used as clean fill on site
- Air monitoring
- Emergency Radiation Response Plan

Please note that CenterPoint is in the process of writing a Request for Proposal (RFP) for soliciting the services of a Safety Professional/Industrial Hygienist to prepare work plans. A draft copy of the RFP will be submitted to MDNR.

Brandenburg® Industrial Service Company
2625 S. Loomis
Chicago, IL 60608
Phone (312) 326-5800
FAX (312) 326-5055

Brandenburg®

www.Brandenburg.com

BANNISTER FEDERAL COMPLEX
DEMOLITION PLAN:
DEMOLITION WORK PLAN

Brandenburg® Industrial Service Company
2625 S. Loomis
Chicago, IL 60608
Phone (312) 326-5800
FAX (312) 326-5055

1.0 INTRODUCTION

This document describes the procedures to be followed in the implementation of contract Work for the Bannister Federal Complex (BFC) demolition. Brandenburg employees and subcontractors must read and understand the contents of this document. We do not intend the contents of this document to cover all situations that may arise nor to waive any provisions specified in federal, state, and local regulations or site owner/contractor requirements. During this project, if any task occurs that is not covered in this Demolition Work Plan (DWP), the individual responsible for that task will inform Brandenburg's Project Manager. Site personnel affected by the new activity and its associated hazards must follow the methods and procedures as identified in the Health and Safety Plan.

The content and format of this Plan is particularly designed for *field supervisors and foreman* to be a user-friendly reference document, with simple, understandable and consistent procedures (*e.g.*, bullet lists, tables, etc.), to promote timely and accurate decision-making processes regarding demolition activities during the project. The contents of this plan will be translated to craft and field personnel during daily work and task briefings as they impact the specific work tasks for that day.

The DWP was developed to:

- Provide site security requirements
- Establish areas to be demolished and areas to be protected
- Outline regulatory requirements
- Outline requirements to complete groundwater remediation system modification
- Provide information regarding equipment and facilities required for the work
- Describe methods for vertical and horizontal demolition
- Establish sequence of demolition activities
- Describe methods for recycling and/or disposal of facility materials
- Outline requirements for site grading, restoration, and documentation
- Describe mobilization, pre-demo and demobilizations procedures
- Describe site closer procedures
- Reference other work plans (Health and Safety Plan, Facility Environmental Assessment, etc.) as they relate to each step in the demolition process

Brandenburg® Industrial Service Company
2625 S. Loomis
Chicago, IL 60608
Phone (312) 326-5800
FAX (312) 326-5055

2.0 BACKGROUND

Prior to the 1920s, the property located at 1600 East Bannister Road in Kansas City, Missouri known currently as the Bannister Federal Complex (BFC) was agricultural. A racetrack was briefly operated on the site in the 1920s. In 1943, during World War II, Pratt & Whitney began manufacturing airplane engines onsite. From 1948 to 1961, jet engines were manufactured. Beginning in 1949, the United States Atomic Energy Commission expanded manufacturing operations, including manufacture of non-nuclear components for nuclear weapons. As part of these operations, hazardous materials were stored, used, and transferred on-site.

Until recently, the National Nuclear Security Agency (NNSA) operated the Kansas City Plant (KCP) for manufacture of non-nuclear components of nuclear weapons. All of the manufacturing activities on site were conducted by KCP, utilizing many buildings, including substantial portions of the Main Manufacturing Building (MMB; Building 1). Honeywell Federal Manufacturing & Technologies, LLC (Honeywell) currently operates the KCP on behalf of the NNSA. Portions of the BFC have also been used for non-manufacturing activities such as warehousing and administration. Most recently, these have been under the auspices of the General Services Administration (GSA), which occupies the western portion of the MMB and several other buildings on site.

All NNSA activities have been transferred to a new facility on Botts Road, approximately 6 miles south of the BFC. It is anticipated that in the near future, all GSA site use will also be terminated, and most of the buildings will become surplus to US Government needs. Some leased portions of the site, including the US Marine Corp activities in buildings east of the Union Pacific Railroad tracks running North and South along the eastern portion of the BFC, may be exempted, however. This Plan pertains exclusively to property west of the railroad tracks.

Brandenburg® Industrial Service Company
2625 S. Loomis
Chicago, IL 60608
Phone (312) 326-5800
FAX (312) 326-5055

3.0 REGULATORY REQUIREMENTS

Conditions that could potentially results in the issuance of a notice of violation by an inspector will be addressed immediately.

3.1 PERMITS

Prior to mobilization, Brandenburg will acquire the necessary permits applicable in order to complete the Work associated with this Plan. Permits include but are not limited to the following:

- City of Kansas City Demolition Permit
- City of Kansas City NESHAP
- State of Missouri NESHAP
- Notice of Intent for PCB Waste Activity
- Missouri Department of Natural Resources Beneficial Reuse Approval
- State of Missouri Portable Crusher Permit(s)
- National Pollutant Discharge Elimination System (NPDES) Construction Notice of Intent
- State of Missouri Underground Storage Tank (UST) Decommissioning Certification – per UST system

3.2 NESHAPs

National Emission Standards for Hazardous Air Pollutants (NESHAPs) are provided in 40 CFR Parts 61 and 63. Engineering controls are to be used to control dust and fugitive emissions from the BFC as part of demolition activities. Examples of dust control include but are not limited to demolition means and methods (leaving perimeter walls erected, controlled demolition practices, etc.) charged water hoses, and DustBoss articulating misters.

3.3 Compliance with Existing Permits

The following Site permits may have requirements associated with demolition activities that were previously part of operations at the BFC. Site personnel will review and become familiar with the following permits as part of the implementation of this Plan:

- Missouri Hazardous Waste Management Facility Part I Permit
- Missouri State Operating Permit
- KCMO Wastewater Discharge Permit issued 06/27/2014

The BFC operates under additional permit requirements that Brandenburg will assume closed prior to the start of demolition:

- KCMO Air Operating Permit No. 03/044Q-QP183
- KCMO Trailer and D/99 Paint Booths No. 694
- KCMO Building 96 Radionuclides No. 726C

Brandenburg® Industrial Service Company
2625 S. Loomis
Chicago, IL 60608
Phone (312) 326-5800
FAX (312) 326-5055

- KCMO D/57 Ethanol Spray Booth No. 804
- KCMO Ceramic Capacitor No. 819
- KCMO Boiler Replacement No. 938A
- KCMO Vapor Degreaser No. 816
- KCMO New Maintenance Paint Booth.

Brandenburg® Industrial Service Company
2625 S. Loomis
Chicago, IL 60608
Phone (312) 326-5800
FAX (312) 326-5055

4.0 INTEGRATION WITH OTHER WORK PLANS

The Site's activities are managed by several work plans. The other work plans provide extensive guidance for numerous aspects of the demolition process. The DWP incorporates key elements of the related plans, where appropriate. However, the related plans should each be reviewed in their entirety to identify additional requirements outside of the scope of this Plan. The most recent versions of these plans are available on site in the Brandenburg office trailer.

4.1 Health and Safety Plan

The Health and Safety Plan (HASP) identifies health and safety procedures to be followed during demolition activities, as well as at all times while on Site

Health and Safety requirements throughout this project may be dynamic and change from day-to-day operations. Brandenburg will complete internal task-specific safety analyses prior to each task being performed. As part of these analyses, Brandenburg will follow OSHA requirements for HAZWOPER training for site personnel as necessary.

4.2 RCRA Corrective Measures Plan

The RCRA Corrective Measures Plan describes methods for conducting assessment work within restricted areas including solid waste management units (SWMUs) and areas of concern (AOCs) procedures. This Plan will be provided by S.S. Papadopulos and Associates.

4.3 Waste Operations Manual

The Waste Operations Manual identifies procedures for managing waste generated at the Site from abatement and demolition activities. Specifically, the Waste Operations Manual addresses the handling of universal wastes and scrap metal; characterization and disposal of fluids and gross accumulation in piping, sumps, trenches, etc; identification of appropriate storage containers and labeling procedures; and procedures for transportation and disposal of debris resulting from demolition work.

4.4 Traffic Control Plan

The Traffic Control Plan provides procedures for routing pedestrian, vehicular, and rail traffic during demolition activities. The Traffic Control Plan also defines the required documentation for shipments of materials leaving the Site.

4.5 Storm Water Pollution Prevention Plan (SWPPP)

The Storm Water pollution Prevention Plan describes actions, controls, and engineering to control runoff from the BFC and proper management of storm water. This Plan will be provided by Lutjen Inc.

4.6 Spill Prevention Control and Countermeasure Plan (SPCC)

Brandenburg® Industrial Service Company
2625 S. Loomis
Chicago, IL 60608
Phone (312) 326-5800
FAX (312) 326-5055

The Spill Prevention Control and Countermeasure Plan is a comprehensive spill prevention and response plan that addresses regulatory requirements related to spill prevention and response. It is intended to provide a comprehensive description of prevention systems and response actions that can be taken to protect personnel and minimize impact to the environment. An SPCC will be completed prior to mobilization as final quantities of onsite liquid storage and spill control that will be needed are definitized.

5.0 MOBILIZATION AND PRE-DEMOLITION ACTIVITIES

Upon notification from CenterPoint Properties, the Brandenburg team will mobilize supplies, equipment, and personnel required for execution of the Work.

Mobilization to the Site will begin with a limited number of personnel working to secure the Site as a demolition area. The demolition areas will be considered restricted access zones with limited access. Once the Site has been secured, mobilization of tools and task-specific equipment to the Site will begin. See Section 10 of this Plan for additional details on equipment to be used. Additional equipment will be delivered to the Site as the job progresses and the job tasks change.

As part of the mobilization and before beginning site work, the Brandenburg Site Health and Safety Officer, or designee, will conduct a health and safety and Site orientation for workers, subcontractors, and any other personnel that will routinely be present on site, in accordance with the HASP.

The following activities will occur after mobilization is completed but before the initiation of demolition activities:

- Erosion and sedimentation control devices will be installed per the *Storm Water Pollution Prevention Plan* developed by Lutjen, Inc. Erosion and sedimentation control devices generally consist of a reinforced silt fence, hay bales, filter fabric, stone construction entrances, and sedimentation basins
- Prior to initiation dismantling operations, equipment will be de-energized and drained. Fluids or residuals collected during the decommissioning process will be handled in accordance with the *Waste Operations Manual*.

5.1 Temporary Facilities and Utilities

The following temporary utilities will be provided by the Utility and maintained if necessary by Brandenburg in support of the contracted services:

- Temporary power services will be provided and maintained. Installation of temporary electrical utilities may be by a licensed electrical Subcontractor if required. Temporary electrical utilities may be installed at select locations.
- Temporary lighting will be provided and maintained.
- Adequate drinking water will be provided for site personnel.
- Adequate portable fire extinguishers and eyewash stations will be provided and maintained within active work areas. Also, adequate water through connected existing fire hydrants will be maintained.
- Temporary portable chemical toilet facilities will be provided and maintained in accordance with applicable regulations, including 29 CFR 1910.120 (n)(3). The facilities will be provided at the time of mobilization and will be maintained in a clean and sanitary condition for the duration of the Work.
- Hand washing facilities, emergency eyewash, and other personnel decontamination facilities will be provided and maintained, as required by applicable regulations and the HASP.

In addition, the location of utilities feeding at or running through structures to be demolished will be evaluated utilizing existing drawings and field verification in addition to recommendations by other CenterPoint Properties Subcontractors. Temporary service locations, as well as final termination locations, will be identified in the field and documented, as necessary.

A temporary rail switch may be installed in the southeast region of the work area to facilitate removal of material from the BFC. A single rail car has the potential to transport quantities up to five (5) times greater than the amount using a single on-road truck. Rail car usage would eliminate the wear and tear of trucking on neighboring roads in addition to a more controlled transport of hazardous materials. Installation and maintenance will be completed in conjunction with the Union Pacific Railroad and CenterPoint Properties.

Four (4) temporary sediment basins will be installed within the work area boundaries to capture stormwater. These sediment basins will be lined with a 60mil polyethylene liner. In addition, a sprung structure approximately 50 feet long by 60 feet wide will be installed to house a filter and pumping system at each basin. Each system will be designed to treat approximately 500 gallons of water per minute and can be scaled up by adding additional system components. See Attachment 3 for additional information.

At Substantial Completion of the contracted services, temporary utility services provided by Brandenburg to support the contracted services will be capped at locations agreed to by CenterPoint Properties and Brandenburg.

5.2 Equipment and Materials

If oil or fuel storage containers are to be mobilized, Lutjen Inc. will be notified prior to allow and confirm locations and inclusion of these containers and appropriate secondary containment and response measures in the site's Spill Prevention Control and Countermeasure (SPCC) Plan. Section 10 provides a list of demolition equipment that will be used on site in the performance of the demolition and abatement scope of work.

Brandenburg® Industrial Service Company
2625 S. Loomis
Chicago, IL 60608
Phone (312) 326-5800
FAX (312) 326-5055

6.0 SECURITY OPERATIONS

The following sections detail procedures to be followed to maintain security during demolition work.

6.1 Sign-in and Tracking Procedures

Project support personnel and Brandenburg employees working at the Site will be required to sigh in and out daily with security personnel at the Site to maintain an accurate log of personnel at the Site.

To the extent possible, Brandenburg and CenterPoint Properties should be notified in advance of anticipated visitors to the Site. Visitors will be required to sign in and out with security personnel and show a valid driver's license when entering the work area (see Traffic Plan for further details). Visitors must also be prepared to detail on the security log the area(s) of the Site they will be visiting and the Site personnel they are visiting.

6.2 Perimeter Security Fencing and Installation of Signage to Prevent Unauthorized Entry

The existing perimeter security fencing will be repaired if damaged during demolition work. At least weekly, the fencing will be inspected and repairs will be coordinated with Brandenburg and utility companies having easements. Fencing (posts, rods, tension wires, fabric, etc.) that requires repair or replacement will match the existing fencing and be repaired with equivalent materials.

Facility security fencing gates will remain closed and locked at all times where practicable. An attendant will be provided when the gates must be open or unlocked to facilitate the Work.

Temporary signage will be provided at the start of the demolition work, as needed, to direct personnel to designated parking areas, office trailers, and site exists. Existing signs will be maintained or replaced every 100 feet around the facility's security fence visible from 25 feet stating *Danger – Unauthorized Personnel Keep Out.*

Temporary signage will be maintained throughout on site activities. Signs that are damaged or faded will be replaced. Temporary signage, including promotional signage, will be removed in conjunction with demobilization activities, or earlier if directed by Brandenburg.

6.3 On Site Security

Brandenburg will provide limited security operations through the course of the demolition work, as needed to fulfill the RCRA permit requirements. Security will be subcontracted through a third party and will be used on off-hours. Approximate off-hours security shits will be the following:

- Monday through Saturday: 6:00 p.m. to 6:00 a.m.

- Sunday: 6:00 a.m. to 6:00 a.m. the following Monday

While work is being conducted as part of this Plan, Brandenburg personnel will control site security.

Security of material, supplies, personnel, or recyclable (including salvage) material will be provided at the Site. Buildings will be secured when work is not actively ongoing to prevent unauthorized entry.

6.4 Report of Security Related Incidents

Verbal reports of security-related incidents will be provided to appropriate authorities, CenterPoint Properties, and Brandenburg as soon as possible, but no more than 2 hours after incidents occur. Incidents to be reported include bur are not limited to: theft, robbery and burglary; evidence of unlawful Site entry; security barrier breach, demolition, or damage; severe weather and other disturbances; contacts with and responses of federal, state, and/or local law enforcement agencies; and contacts and responses of local medical service providers for accidents and medical emergencies. Incidents will be documented by the Site FHSO.

Missouri Department of Natural Resources staff may periodically visit the site to conduct inspections, oversee regulatory issues, etc. These personnel will not be subject to search, but will be required to obey the remainder of the Security Safety Policy and Procedure as well as the health and safety requirements of the site.

Brandenburg® Industrial Service Company
2625 S. Loomis
Chicago, IL 60608
Phone (312) 326-5800
FAX (312) 326-5055

7.0 AREAS TO BE DEMOLISHED

In general, the project includes the comprehensive demolition of all existing structures including interior debris, building structures and components, exterior retaining walls, pipe racks, and components from the Site.

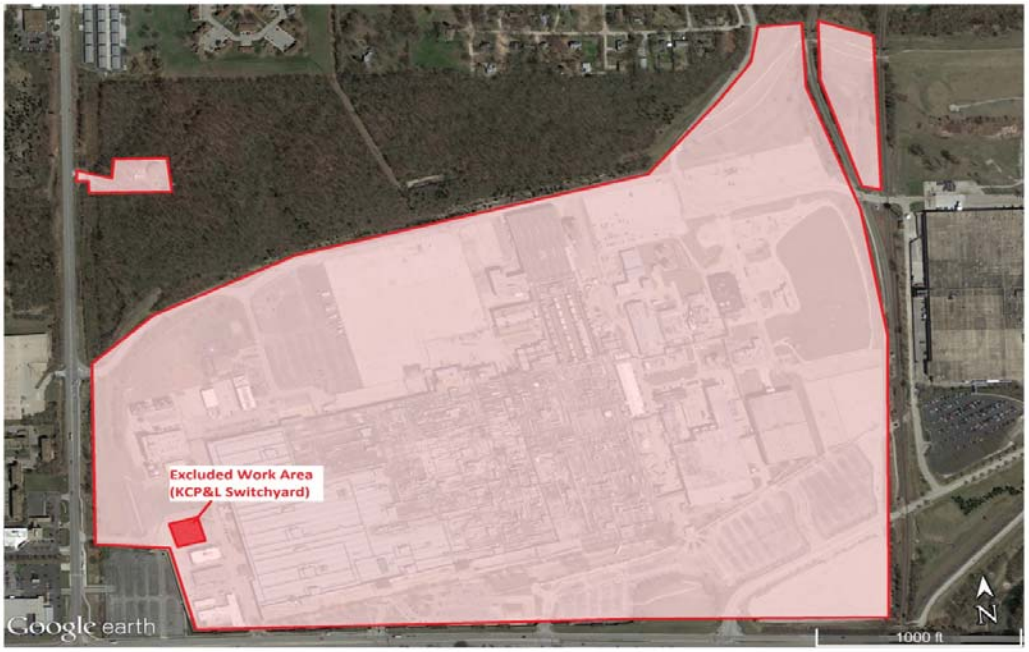
Demolition of roadways, parking areas, at-grade slabs and below-grade structures and foundations are generally included in the work. Below-grade structures and utilities will be removed to a depth of 12 feet; beyond this depth, any accessible horizontal structure or one that which would create an impermeable basin for groundwater will be punctured to allow adequate groundwater flow. Utilities located deeper than 12 feet will be cut and capped or filled with controlled low-strength material as referenced in documentation provided by Lutjen Inc.

BFC has undertaken a program to purge, clean, and make existing tanks and vessels access-ready. In addition, BFC has also purged and flushed select utility and raw material and product process piping. Tanks, equipment, and piping systems that have not been purged or flushed by the BFC are to be drained as part of the contracted work before demolition. Purging, cleaning methods, and approximate volumes of potential waste are detailed in Section 10.

Demolition of tanks, equipment, or other oil storage containers listed in the Site SPCC Plan will be coordinated with Lutjen Inc. before demolition so that the closure of these storage systems can be documented as part of the current SPCC Plan closure process.

On site utilities not referenced in Section 5.1 will be demolished in accordance with the procedures outlined in Section 10.

The boundaries of areas work will commence as part of this Plan is as follows:



Brandenburg® Industrial Service Company
2625 S. Loomis
Chicago, IL 60608
Phone (312) 326-5800
FAX (312) 326-5055

8.0 AREAS TO BE PROTECTED

The following areas are not included as part of demolition work and are to be protected:

- Site railroad infrastructure including track, ties, and switches are to remain and be protected during demolition. The areas of rail storage are identified in the Traffic Control Plan.
- Kansas City Power & Light Switchyard located approximately 400 feet east of Troost Avenue; work/access may commence within this area by the Utility
- Groundwater monitoring wells, piezometers, recovery wells, and permitted outfalls. These structures will be flagged in the field by Brandenburg and free access to these structures will be maintained to allow continuous access during demolition. If removal or altering of these structures is to occur, it will be under coordination with Brandenburg to facilitate work in order to minimize undesired damage. Any modification, abandonment, or reinstallation of monitoring wells or recovery wells shall comply with Missouri Well Construction Rules contained in 10 CSR 23-4.

Brandenburg® Industrial Service Company
2625 S. Loomis
Chicago, IL 60608
Phone (312) 326-5800
FAX (312) 326-5055

9.0 ONGOING OPERATIONS

The BFC has stopped all production operations including the operation of the oil fired steam plant and central utility plants. However, one ongoing operation is continuing and may overlap with the decontamination and demolition activities.

9.1 Wastewater Treatment Operations

The existing wastewater treatment plant will remain active during the course of demolition to continue operation of the groundwater treatment system. Prior to utility disconnections as part of the pre-demolition activities, a temporary electrical system will be fed and dedicated to the operation of this plant to avoid an interruption in service. The wastewater treatment plant will not be used to treat sanitary wastes generated during the demolition protect or to treat wastewaters or rinse waters generated during the decontamination or demolition activities. The primary objective of the wastewater treatment plant is to continue treatment operations of the groundwater system.

10.0 GENERAL INFORMATION AND PROCEDURES

The following sections provide general information and procedures for the demolition of the Site.

10.1 Temporary Facilities/Utilities and Installations Required to Conduct the Work

Brandenburg will coordinate utility isolation/verification from incoming electrical and potable water utility services if necessary; if the utility or independent feed remains, individual buildings/operations will be isolated from the site distribution. Brandenburg will assume that temporary lighting, convenience power and water services must be provided at individual work areas at a minimum. Brandenburg will investigate accessibility of existing electrical and water services at individual buildings, and any modifications to access these services would be its responsibility and would require coordination and approval with CenterPoint Properties. Permanent de-activation of these services will be the responsibility of Brandenburg before initiation of physical demolition. Services will be isolated and removed sequentially as necessary to support the work as part of the overall phasing plan.

Active utility services will be painted red at the building service entrance to signify that they are active or “hot” per the Zero Energy Standard Operating Procedure (See Attachment 2 for Brandenburg Standard Operating Procedure Manual). Prior to initiating structural dismantlement, project personnel will verify the disconnection of any utility service (temporary or otherwise), which may have serviced structures to be removed. SOPs mandate that all utility isolations be performed with a physical air gap separation, which may be visually verifiable. All de-energized power sources are then marked with green paint to signify that they are ready for demolition.

The use of the following temporary systems will be required for the completion of the project:

10.1.1 Temporary Power

It is anticipated that portable generators will be used to provide local power to temporary power panels, as required to power temporary lighting, machines and/or tools required to support the contracted activities. Power system modifications will be performed by an appropriately licensed electrical Subcontractor if necessary.

10.1.2 Temporary Water

A supply of non-potable water from the local municipality will be retained on site by Brandenburg that Subcontractors can access. Initial investigation of this system indicated a number of below-grade leaks. Brandenburg and CenterPoint Properties will evaluate as needed and, if necessary, install a new system. As it is anticipated that multiple concurrent activities will require water consumption, all Subcontractors must share and coordinate access to the available non-potable water source on site. Subcontractors shall provide water to their individual work areas utilizing trucks, portable tanks or hoses. Final water utility termination at individual buildings/operations will be isolated by Brandenburg by cutting and capping the incoming service at the building entrance at

locations to be determined. All disconnection points will be documented on utility plan drawings to be submitted to CenterPoint Properties.

10.1.3 Storm Water Pollution Prevention Plan (SWPPP)

Erosion and sedimentation control devices will be installed per the *Storm Water Pollution Prevention Plan* developed by Lutjen Inc. It is the purpose of this plan to control or eliminate the migration of silt or sediment from the site and into the area waterways or streets utilizing a series of engineering controls. Prior to initiating dismantlement, devices will be installed as detailed in the *Storm Water Pollution Prevention Plan*. Selective demolition may be completed of above or below grade structures, site utilities, or impervious surfaces to facilitate installation of temporary sediment basins prior to the initiation of the vertical demolition sequence described in Section 11. In addition, trucks leaving the site that have the potential to track dirt or mud onto the streets will be required to exit through an onsite truck wash and across an engineered track out pad. Daily inspections of the roadways adjacent to the Site will be performed. Street sweeping will be performed as needed to maintain clean roadways.

10.1.4 Bicron Radiation Detection System

In addition to the truck wash and track out pads, trucks will be required to proceed through a Bicron radiation detector station prior to exiting the site. The Bicron will be calibrated and detection levels set based on manufacturers recommendations. If the Bicron alarm is sounded, the truck driver will stop and immediately contact Brandenburg personnel for further direction. See Attachment 3 for additional information on the Bicron system.

An additional Bicron station will be installed on the rail system described in Section 5.1. Railcars containing material from BFC will be transported through the detection footprint of the Bicron. If the Bicron alarm is sounded, the rail engineer will be signaled to stop and Brandenburg personnel will be immediately contacted for assistance.

10.1.5 Environmental Controls

Dust, noise, odor, and vibration are all inevitable by-products of demolition that have the potential to negatively impact the adjacent environment. A system of environmental engineering controls will be utilized to provide a demolition project that has a minimal impact on the surrounding community.

The following engineering controls and techniques will be utilized to control dust and fugitive emissions from the project site:

- Telescopic/Mobile Misters
- DustBoss stationary mister systems
- Manned fire hoses at ground level
- Manned or unmanned fire hoses elevated by manlifts
- Water Truck(s)

Personnel air monitoring of site workers may be performed consistent with the HASP. If employed, a representative number of personal air samples will be collected throughout the project for asbestos, lead, dust, or other airborne contaminant(s) encountered during the demolition activities. These samples will be used to demonstrate that employee exposure levels are in compliance with Occupational Health and Safety Administration (OSHA) acceptable levels. If the monitoring results indicate employee exposures in excess of the acceptable levels, work practices will be reviewed and necessary adjustments will be implemented to reduce exposure levels to within acceptable limits.

Baseline perimeter air monitoring has been completed by Auxier and Associates in order to achieve a baseline for particulates and other potential contaminant(s) in the ambient air surrounding the BFC. Brandenburg will perform additional air monitoring at the perimeter of the BFC while demolition activities are being conducted. Additional information on air monitoring and constituents involved will be addressed in the HASP.

Work will be performed within allowable work hours and in accordance with applicable local noise control regulations.

10.1.6 Surface Water Control

Temporary drainage ditches may be constructed by Brandenburg as needed to prevent damage from surface water to ongoing work, the Site, and adjoining properties. Surface runoff and storm water runoff prevention and controls are outlined in the Storm Water Pollution Prevention Plan generated by Lutjen Inc.

10.2 Sequencing Demolition to Minimize Contaminated Material Storage

Work will be sequenced in a manner that will allow for the bulk shipment of contaminated wastes whenever possible. Tasks involving the removal and disposal of homogenous contaminated materials will be sequenced together, allowing for the shipment of the waste stream to occur in a continuous and economical manner. In some stances, contaminated material removal can be suspended or sequenced later in the schedule (rather than removed and stored on site) until sufficient quantities can be generated to allow for efficient shipment and disposal. Storage of contaminated materials will be according to applicable regulations and is discussed further in the *Waste Operations Manual*.

10.3 Hazardous and/or Environmentally Impacted Removal

The following will serve to outline the means and methods that will be used so that hazardous/contaminated materials are properly identified, contained and removed from the Site. Due to the nature of the industrial manufacturing process that occurred at the Site, it is anticipated that materials designated as hazardous and/or contaminated may be encountered within piping, equipment or structures to be demolished. The removal of these materials will require special attention so that workers remain protected from possible exposures, contaminants are not released offsite, and that waste is disposed properly. Use of Personal Protective Equipment (PPE) and control of worker exposure during these activities is covered in-depth in the HASP. Work will be performed by OSHA Hazardous Waste operations (HAZWOPER) trained workers and supervisors.

Brandenburg® Industrial Service Company
2625 S. Loomis
Chicago, IL 60608
Phone (312) 326-5800
FAX (312) 326-5055

10.3.1 Asbestos

A survey of the BFC was completed by Brandenburg to investigate the presence of asbestos containing materials. The Missouri Department of Natural Resources defines asbestos containing materials as any material or product which contains more than one percent (1%) asbestos. The *Environmental Assessment – CenterPoint NNSA* dated August 11, 2015 describes in detail the locations and quantities of asbestos containing materials located within the identified work boundaries referenced in Section 7.0. Attachment 2 depicts Brandenburg Standard Operating Procedures for abatement practices for asbestos containing materials.

Brandenburg has established the following work procedures for performing asbestos abatement operations in compliance with the Occupational Safety and Health Administrations' Revised Standards for Asbestos in Construction 29 CFR 1926.1101, the National Emission Standards for Hazardous Air Pollutants 40 CFR 61.145, Missouri Air Quality Regulations 10 CSR 10-6, Missouri Air Conservation Section 643, and Kansas City Code of Ordinances 8-9.

Brandenburg considers regulatory compliance and a proactive approach to worker safety to be essential components of our operation. The following sections specifically address all aspects of responsible abatement work practices.

Brandenburg will utilize the following procedures for the removal of asbestos containing materials within the Bannister Federal Complex. This work plan will be strictly adhered to whether Brandenburg elects to self perform the asbestos abatement activities or subcontract the asbestos containing materials.

1.1 Initial Exposure Assessment

An Initial Exposure Assessment will be performed at the initiation of the abatement operation to ascertain expected exposures during said operation.

1.2 Negative Exposure Assessment

A Negative Exposure Assessment will be performed at the initiation of the abatement operation if such assessment is applicable to the operation pursuant to 1926.1101 (2)(iii)(B).

1.3 Periodic Monitoring

Brandenburg will perform daily monitoring which is representative of the exposure of each employee assigned to work in regulated area performing Class I or Class II work unless a negative exposure assessment has been made for the entire operation.

Brandenburg will institute/resume exposure monitoring whenever there is a change in process, control equipment, personnel or work practices that may result in new or additional exposures above the PEL and/or excursion limit.

Brandenburg® Industrial Service Company
2625 S. Loomis
Chicago, IL 60608
Phone (312) 326-5800
FAX (312) 326-5055

1.4 Regulated Areas:

All Class I and II asbestos work will be conducted within regulated areas. Access to the regulated area shall be limited to authorized persons
.

1.5 Demarcation:

Warning signs that demarcate the regulated area will be provided and displayed at each location where a regulated area is required to be established. The warning signs shall bear the following information: Danger, Asbestos, Cancer and Lung Disease Hazard, Authorized Personnel Only, Respirators and Protective Clothing Are Required in This Area.

1.6 Respiratory Selection:

Brandenburg will ensure that the subcontractor will provide appropriate respirator as specified in Table 1 paragraph (h)(2)(iii), (iv),(v)-(h)(4)(ii) of 29 CFR 1926.1101 and maintain a respirator program in accordance with 1910.134(b), (d), (e), and (f).
Brandenburg will ensure that the proper respiratory protection will be used for the following.

During all Class I work.

During all Class II work where ACM is not removed in a “substantially intact state”.

During all Class II work which is not performed using wet methods.

During Class II work where a “negative exposure assessment” has not been prepared.

During any work where exposure occurs above the PEL or excursion limit.

Brandenburg will provide and require the use of an approved half-face air purifying respirator for Class II jobs where a negative exposure assessment has not been performed.

1.7 Protective Clothing

Brandenburg will ensure the use of protective clothing, such as Tyvek coveralls, head coverings, gloves and foot coverings for all employees performing abatement activities. The competent person will examine work suits worn by employees at least once per work shift for rips or tears that may occur during performance of work and will mend or replace work suits immediately if needed.

1.8 Hygiene Facilities and Practices:

Will be provided and performed as required in section (j) of 29 CFR 1926.110. The decontamination trailer will be established near the all class I activities.

The connected (3) staged decontamination unit constructed in conformance with part (j) of 29 CFR 1926.110, will be connected to the work area.

1.9 Engineering Controls:

HEPA vacuums will be used as needed.

Wet methods will be used.

Prompt clean up and disposal of waste in leak tight containers.

Local exhaust ventilation equipped with HEPA filters as needed.

Enclosures will be used whenever feasible.

1.10 Prohibited Work Practices

High speed abrasive disc saws not equipped with point of cut ventilator or used in an enclosure with HEPA filtered exhaust air will not be used

Compressed air unless used in conjunction with an enclosed ventilation system designed to capture any emission created will not be used

Dry sweeping, shoveling or other dry clean-up of ACM dust and debris will not be used

Employee rotation to reduce exposure levels will not occur

1.11 General Class I Removal Procedures:

Will be supervised by a “Competent Person”

Critical barriers will be placed over all openings

HVAC systems will be sealed with a double layer of 6 mil poly

Impermeable drop cloths or plastic sheeting secured by duct tape will be used

The regulated area will be ventilated to move contaminated air away from the breathing zone of employees toward a filtration or collection device equipped with a HEPA filter.

Negative pressure enclosures will be established where feasible:

Incorporating at least 4 air changes per hour

With a minimum of 0.02 column inches of water pressure differential relative to outside pressure

NPE will be inspected for breaches and smoke tested for leaks and kept under negative pressure throughout the period of its use

Brandenburg® Industrial Service Company
2625 S. Loomis
Chicago, IL 60608
Phone (312) 326-5800
FAX (312) 326-5055

1.12 General Class II Removal Procedures and Engineering Controls

Will be supervised by a “Competent Person”

Will utilize critical barriers

Impermeable drop cloths or plastic sheeting will be placed beneath all removal activity

Will utilize material specific work practices as referenced below

Italicized procedures are only required when a “Negative Exposure Assessment” has not been demonstrated

National Emission Standards for Hazardous Air Pollutants Revision Final Rule dated November 20, 1990 (40 CFR Part 61, subpart M)

1.13 General Asbestos Procedures:

Provide timely and complete written notification to authorities of intention to demolish or renovate a facility. The approved state forms shall be used to comply with local jurisdiction covering the work.

Secure a survey of asbestos containing materials in the facility including Category I and Category II nonfriable materials. (61.145a)

Comply with specific procedures for asbestos emission control and supervisor training. (61.145c)

Discharge no visible emissions to the outside air during the collection, processing, or transportation of asbestos containing material. (61.150a)

Label the containers or wrapped materials using warning labels specified by OSHA. (61.150a1iv)

Landfill asbestos containing materials as soon as practical at a waste disposal site licensed to receive such waste. (61.150b)

Label the containers or wrapped materials with the name and location of the generator. (61.150a1v)

Document each load of asbestos containing material landfilled with a Waste Shipment Record (61.150d)

1.14 Competent Person Supervisory Responsibilities

Set up procedures to control access and egress from the enclosure

Oversee all employee monitoring

Brandenburg® Industrial Service Company
2625 S. Loomis
Chicago, IL 60608
Phone (312) 326-5800
FAX (312) 326-5055

Ensure that workers wear PPE and utilize respiratory protection as required

Ensure that employees set up and remove engineering controls, use proper work practices and PPE in compliance with all requirements

Ensure that workers use hygiene facilities and observe the decontamination procedures specified

Ensure that engineering controls are functioning properly and employees are using proper work practices

Ensure that notification requirements are met at the federal, state and local level

1.15 Project Specific Asbestos Removal Procedures:

The following asbestos containing materials have been identified within the structures to be demolished. Brandenburg will identify the manner in which these materials will be abated and how they safely will be handled prior to the demolition procedures. Please note Brandenburg will remove all asbestos containing materials with the exception of category I non friable roofing materials as specified within the following removal procedures prior to the initiation of demolition work. The following materials are identified as asbestos containing materials. Items are listed according to provided survey results and phasing:

Brandenburg® Industrial Service Company
2625 S. Loomis
Chicago, IL 60608
Phone (312) 326-5800
FAX (312) 326-5055

Brandenburg®

www.Brandenburg.com

JHF Consulting Inc
NNSA
Quantities of ACM by Building 8/11/2015

Building	Floor Tile / Mastic sq ft	Cork Ceiling sq ft	Glue Dots	Transite Walls & Ceilings sq ft	Pipe Insulation Lin Ft	Transite Conduit	Mastic Coating/Duct Insul. Sq ft	Exterior Coating sq ft	Pipe Penetrations Loc	Roofing & Flashing	Flr Caulk Lin Ft	Flashing (Perimeter Ft)	Window Caulk	Lab Table	Drain Caulk ft	Exterior Wall Caulk Ft	Raised Floor ft	Fire Proof sq ft	Roof Steel Support Mastic
Bldg 1 GSA Bsmt	19,206		10,000		2,059														
Bldg 1 GSA 1 Flr					1,848	4,000										2,640			
Bldg 2 GSA Bsmt	101,376																		
Bldg 2 GSA 1 Flr	101,376																		
Bldg 2 GSA 2 Flr																			
Bldg 1 Main Flr	263,500			92,070	21,156	6,000			1,320					7					
Bldg 1 MEZZ	4,703			6,336	455														
Bldg 1 Roof							198,000			1,359,600									11,000
Bldg 13	38,075			3,960	18,909										3		13		
Bldg 14	13,125				2,703									13					
Bldg 15	792			1,584	79														
Bldg 1-Base	117,266	4,950		18,810	3,027														
Bldg 2 NNSA 1 Flr	52,800												7,920						
Bldg 2 NNSA 2 Flr	105,600			10,560	1,320														
Bldg 2 NNSA Bsmt	33,000				3,300														
Bldg 41 Bsmt/Ext					924														
Bldg 42										14,850									
Bldg 48				1,584															
Bldg 54	7,500			1,980	228								792						
Bldg 73					132														
Bldg 74									66										
Bldg 87	20,675			12,804	1,208					114,048									
Bldg 88					208														
Bldg 89					33						264							264	
Bldg 91							66												
Bldg 92 Bsmt	9,075																		
Bldg 92 1 Flr	72,600																		
Bldg 92 2 Flr	51,975											2,640							
Bldg 96								5,544											
Totals	**1,012,643**	**4,950**	**10,000**	**149,688**	**57,590**	**10,000**	**198,066**	**5,544**	**1,386**	**1,488,498**	**264**	**2,640**	**8,712**	**20**	**3**	**2,640**	**13**	**264**	**11,000**

Brandenburg® Industrial Service Company
2625 S. Loomis
Chicago, IL 60608
Phone (312) 326-5800
FAX (312) 326-5055

Brandenburg will first perform a hazard assessment to determine the risk associated with each type of asbestos containing materials. In addition, Brandenburg will assess how the following activities could potentially expose employees to asbestos. Once the evaluation has been completed Brandenburg will begin the work to remove the asbestos containing material. Brandenburg will utilize the following controls for the handling of asbestos containing materials throughout the project.

Roofing / flashing:

Brandenburg will identify the roofing paper / flashing. The materials will be removed and loaded during the demolition phase of the project utilizing wet work methods and immediate transportation and disposal to an approved landfill as general demolition debris.

Interior Tank or Duct Insulation:

Brandenburg will construct a negative pressure enclosure within the work area. The negative pressure enclosure will constructed of two layers of 6 millimeter polyethylene sheeting. Negative air machines of sufficient size and quantity will be utilized to keep the air pressure differential less than -0.2” of water. Brandenburg will then utilize wet work methods strip the materials and place them into approved disposal bag and place them into a lined roll of container.

Exterior Duct Insulation / Steel Support Paint / Coating:

The exterior duct insulation, steel support paint and the exterior coating on Building 92 will be removed following Section 8-9(c)(7)c of the Kansas City Code of Ordinances. The abatement work area will be demarcated with tape and a snow fence type material to keep all non-abatement personel at least 50’ from the work area. Any nearby windows or doors will be sealed with polyethylene sheeting. The ACM will be wetted, removed and contained within two layers of poly (bags or wrapped in sheeting). The contained material will be labeled and placed into containers for offsite disposition.

Fire Doors:

Fire doors will be removed intact from their locations by cutting the steel supports. Once removed, the doors will be wrapped in polyethylene sheeting, labeled, and placed into a lined roll off container for offsite disposition.

Window Caulk:

Brandenburg will place polyethylene sheeting on the ground surface immediately beneath windows to be removed. The window glazing will be adequately wetted prior to removal. The window frames will be pulled from the window structure through the use of hydraulic equipment. Once each frame is removed, the frame, window and glazing/caulk will be placed in a lined roll-off for offsite disposal. Once an area of windows has been completed the polyethylene sheeting will be picked up and placed in the lined roll-off for disposal as well. HEPA vacuums will also be utilized if necessary to collect any caulking or glazing that may have previously fallen from the windows.

Brandenburg® Industrial Service Company
2625 S. Loomis
Chicago, IL 60608
Phone (312) 326-5800
FAX (312) 326-5055

Floor / Wall Caulk:

Brandenburg will either sawcut, break or cut on either side of the caulking materials. The ACM caulk will be collected and placed into bags. HEPA vacuums will also be utilized if necessary to collect any caulking or glazing that may have previously fallen from the windows. The bagged material will be labeled and placed into containers for offsite disposition.

VAT and Associated Mastic:

Brandenburg will construct a negative pressure enclosure within the work area. The negative pressure enclosure will constructed of two layers of 6 millimeter polyethylene sheeting. Negative air machines of sufficient size and quantity will be utilized to keep the air pressure differential less than -0.2” of water. Brandenburg will utilize a combination of skid steer scrapers and hand scrapers to free the tile from the substrate. The materials and place them into approved disposal bag and place them into a lined roll of container. Brandenburg will then utilize a high flash mastic remover to the remaining adhesive. The mastic will be removed by a buffer equipped with an abrasive pad; any remaining liquid will be pushed to a corner of the structure and be solidified with oil dry and properly packaged for offsite disposal.

Transite Panels and Piping:

Brandenburg will demarcate the area utilizing caution tape. Next, Brandenburg will place a 6 millimeter polyethylene sheeting beneath the work area. Brandenburg will then wet the piping and remove said piping by laborers unbolting or torch cutting the heads off of the bolts holding the sheets in place. The sheets will be carefully lowered to the ground where they will be re wetted and wrapped in polyethylene sheeting labeled and placed into a lined roll off container for offsite disposition.

Glove Bagging or Wrapping Procedures:

Brandenburg will complete pipe wrapping or glove bagging procedures on asbestos pipe or ductwork which needs to be removed in order to complete the construction of containment areas. The wrapping techniques will be accomplished by placing 2 layers of 6 mil polyethylene sheeting surrounding the facility component or pipe. The unit would then be lowered to the ground and placed into a negative pressure enclosure which has been set up within the existing building for further abatement or will be placed into a lined roll off container for offsite disposition.

Gross Containment Methods:

This method will be utilized for the abatement of large areas containing large amounts of piping. Brandenburg shall construct a containment surrounding the area and complete the work in accordance to general industry standards. Containments will be constructed of 2” by 4” lumber (or utilize existing structures within the building) with 6 mil poly sheeting. Each containment will have sufficient negative air machines to provide a negative .02” of water column of air pressure

Brandenburg® Industrial Service Company
2625 S. Loomis
Chicago, IL 60608
Phone (312) 326-5800
FAX (312) 326-5055

10.3.2 Paint with Lead and other RCRA Metals

Missouri Department of Natural Resources has determined that there are eight (8) heavy metals of concern in 40 CFR Part 261, Table 1 – Maximum Concentration of Contaminants for the Toxicity Characteristic. These metals are commonly referred to as the Resource Conservation and Recovery Act (RCRA) metals. They are: arsenic, barium, cadmium, chromium, lead, mercury, selenium, and silver. Brandenburg has completed a survey of the BFC and determined areas upon which painted surfaces on media to be reused as clean fill contain these RCRA heavy metals above the maximum approved levels designated by the Missouri DNR. A summary of these findings is included as part of this Plan.

Results of this survey indicated the following approximate quantities for media painted with what MDNR classifies as “lead-based paint”:

Color	**Substrate**	**Quantity (SF)**
White	Concrete Ceiling	27,000
Tan	Block Wall	18,000
Yellow	Floor	6,000
White	Block / Concrete Wall	22,000
Yellow	Column	1,000
Grey	Floor	2,000
Pink	Concrete Wall	4,000
Tan	Concrete Ceiling	7,000
Black	Block Wall	4,000
Green	Block/Concrete Wall	10,000
Yellow	Floor	4,000
Beige	Block Wall	4,000
White	Column	1,000
Grey	Column	1,000
Orange	Column	1,000

Yellow	Column	1,000

In addition, the following are quantities for media of which the additional metal content (As, Ba, Cd, Cr, Hg, Se, Ag) exceeded the maximum approved levels for reuse:

Color	**Substrate**	**Quantity (SF)**
Red	Concrete Floor	8,463
Red	Concrete Column	822
Tan	CMU Wall	1,500

With the exception of lead, results of the RCRA Heavy Metal survey indicated the red paint used to demarcate space around life safety and fire protection items generally located in main hallways of Building 1 exceeded Missouri DNR reuse criteria.

Removal of paint containing these RCRA heavy metals will vary depending on adhered-to media per the following:

- CMU – CMU blocks will be segregated as a separate waste stream and disposed of in a solid waste landfill
- Concrete – removal of the painted surfaces on concrete will be conducted by the use of a Needlegun scaler or similar equipment with appropriate Personal Protective Equipment, ventilation, and negative pressure to capture the paint and any particulate generated.

10.3.3 Beryllium Decontamination

Beryllium is a silver-gray metallic element that occurs naturally in about 30 minerals. Minerals containing beryllium are found in rocks, coal, oil, soil, and volcanic dust. From these sources, beryllium is emitted into the air and water by natural processes, such as erosion, and by the burning of coal and oil.

Beryllium metal has been produced for various industrial uses to strengthen other metals. As an industrial material, beryllium possesses some uncommon qualities, such as its ability to withstand extreme heat, remain stable over a wide range of temperatures, and function as an excellent thermal conductor.

Beryllium becomes a health hazard when particles of the metal become airborne in the form of dusts, mists or fumes that can be inhaled. Inhalation of beryllium particles can result in beryllium sensitization which can lead to chronic beryllium disease.

The results of the Facility *Environmental Assessment* has designated areas where Brandenburg has found trace amounts of beryllium on building surfaces including but not

limited to concrete, CMU, structural members, ferrous utilities, etc. Brandenburg will delineate areas in the field and install water management practices such as temporary berms and utility plugs to control water being generated. Brandenburg will decontaminate these surfaces by the use of manned pressure washers with non-potable water and if necessary detergent, and collect the wash water. Wash water will be transported and disposed of offsite.

10.3.4 Universal Waste

***PCB light ballasts*;** These materials will be removed from the fixture and staged within a waste storage area. Brandenburg will then package the materials into 17- H DOT drums and labeled with the appropriate DOT and EPA labels. The hazard description for the materials will be RQ Polychlorinated Biphenyls solid, 9, UN2315, PG II.

Non PCB light ballasts: These materials will be removed from the fixture and it will be verified that the ballasts are marked non PCB or produced after 1983. If the ballasts are not marked in such a manner they will be handled as PCB light ballasts. If the appropriate marking exists Brandenburg will package the materials into roll off containers and recycle the materials as scrap metals.

Lead Acid Batteries: These materials will be removed from the structure and placed on wooden pallets. The batteries will be stacked a maximum height of 3 layers with cardboard separating each layer. The batteries will then be banded and shrink wrapped. These materials will be recycled and the appropriate DOT information on the package will be RQ Batteries, wet filled with acid 8, UN2794, PGIII.

Nickel Cadmium batteries: These materials will be removed from the fixture and staged within a waste storage area. Brandenburg will then package the materials into 17- H DOT drums and labeled with the appropriate DOT and EPA labels. These materials will be shipped as Nickel Cadmium batteries under the universal waste regulations.

Hydraulic oils: These materials will be drained into 55 gallon drums and staged in the waste marshalling area until Brandenburg determines there is sufficient enough material to call a used oil reclaimer. Brandenburg shall then utilize a tank truck to pump the drums free and recycle the oils.

Non PCB dielectric fluids: These materials will be managed as used oils under the used oil regulations said materials will be shipped via vacuum trucks to a Brandenburg approved used oil reclaimer.

Mercury light bulbs: These materials will be removed from the light fixtures intact and placed into DOT approved cardboard containers and labeled with the appropriate DOT and EPA labels. The hazard description for the materials will be RQ Mercury contained in manufactured articles 8, UN2809, PGIII.

Mercury Switches / other items:
HID bulbs: These materials will be removed from the light fixtures intact and placed into DOT approved cardboard containers, and labeled with the appropriate DOT and EPA

labels. The hazard description for the materials will be RQ Mercury contained in manufactured articles 8, UN2809, PGIII.

Exit Signs *(radioactive):* The tritium containing exit signs will be removed from the structure intact. These units will be returned to the manufacturer for proper disposition.
TVs / Screens: Television and screens will be collected and shipped to an approved E-Waste recycling company.

Compressed Nitrogen Cylinders: The nitrogen cylinders will be brought to the exterior of the building structure and vented. Once vented, the cylinder valves will be removed and the cylinder body and valve will be recycled as scrap metal.

Fire Extinguishers: Chemical fire extinguishers will be brought to a staging area, where they will be loaded and reclaimed at an approved vendor for reuse.

10.3.5 Hazardous Waste Sludge

Results of the *Facility Environmental Assessment* indicated one (1) area of the BFC that would be classified as a hazardous waste. This area contains plating and etching sludge contaminated with lead. An estimated 30 tons of this impacted material will be removed for disposal.

10.3.6 Residual Removal, Characterization, and Disposal

Fluids and residues will be characterized previously and disposed in accordance with the procedures outlined in the *Waste Operations Manual* and Brandenburg Standard Operating Procedure Manual (Attachment 2).

BFC has undertaken a program to purge, clean, and make existing tanks and vessels access-ready. In addition, BFC has also purged and flushed select utility and raw material and product process piping. Tanks, equipment, and piping systems that have not been purged or flushed by the BFC are to be drained as part of the contracted work before demolition. Purging and cleaning methods are detailed in Section 9.5. It is anticipated the following approximate volumes of residual material are to be disposed of as part of the BFC demolition:

- 3,435 gallons caustic rinse
- 5,941 gallons acid rinse
- 1,421 gallons cyanide rinse
- 1,633 gallons chromium rinse

10.3.6.1 Line Breaking

Prior to demolition in process areas, line breaking activities will be performed as a means to capture (or verify the absence of) residual fluids or sludge that may remain in the process systems.

The line breaking process will occur as follows:

- Prior to beginning line breaking work in any area, the chemicals or process-related fluids or materials that are expected to be encountered in the work area will be reviewed with operational personal and the Field Supervisor.
- Process lines and vessels will be differentiated from non-process lines (steam, water, etc). Process lines will be identified traced out, and marked in the field.

10.3.6.2 Containment for Line-Breaks and Other Activities Where Liquids Are Handled

Before beginning line breaking in any work area, all potential points of migration (drains, trenches, etc) to the storm sewers will be identified. The work area will be isolated from the storm sewer systems by plugging or sealing the appropriate collection points in the vicinity of the Work. Primary containment and capture of fluids generated during line breaking will be by buckets or drain pans. Containment systems in each work area will be removed upon the completion of activities that have the potential to generate a release (i.e. line breaking and vertical demolition in process areas).

10.3.6.3 Spill Containment and Cleanup Procedures and Supplies

A supply of spill response materials, such as absorbent pads, socks, and booms, will be maintained by Brandenburg in the event a spill needs to be contained, as detailed in the HASP. Spill response Subcontractors may be mobilized in the event of a large scale spill that cannot be managed by site personnel. Refer to the Site SPCC for additional information of spill countermeasures and cleanup procedures.

- Piping low points, valves, and termination points (vessels, blind flanges) will be identified and marked in the field.
- The lines will be opened at low and termination points by opening valves, removing blinds, disconnecting flanged connections, drilling and/or removing sections of piping.
- Upon breaking of the line, residuals that drain from the openings will be collected. Lines will be allowed to drain and residuals collected for a period of 24 hours.
- At the completion of line breaking and residual collection activities in a given area and before turning the area over for demolition, the area will be walked down to verify all potential collection points for residuals have been opened.

10.3.7 Above-grade Impacted Concrete, Brick, CMU

Concrete, brick, and CMU were used in the construction of many of the structures on site. At each location where it has been identified that concrete, brick, and/or CMU are unable to be recycled, they will be disposed of offsite in accordance with the procedures presented in the *Waste Operations Manual*. Materials will be segregated and transported in the most cost effective way to separate the material so that its method of disposition is consistent with its level and nature of contamination that will be assessed.

The results of the *Facility Environmental Assessment* will be used to identify the extent and nature of contamination that may exist in slabs or masonry block systems to be removed as part of this scope of work. As recycling is the most cost-effective method of offsite disposition, wherever practical, contaminated concrete will be isolated and selectively removed from non-contaminated material.

Small areas of contamination will be evaluated on a case by case basis to determine if selective removal of contamination for waste segregation purposes is cost effective. In small areas where it is cost effective, the material may be isolated and removed by saw cutting an/or other selective demolition techniques (mini excavators, skid steers with hammers, hand labor, etc.). This will allow gross structural demolition to proceed in an uninterrupted manner and will prevent the potential for cross contamination of waste streams. In cases where the contamination exists throughout a larger area of the structure, or selective removal would not be safe, practical or cost-effective, the entire structure will be demolished in place with all resulting non-metallic debris being disposed of at a landfill appropriate for the contamination present.

10.3.7.1 PCB Remediation Waste

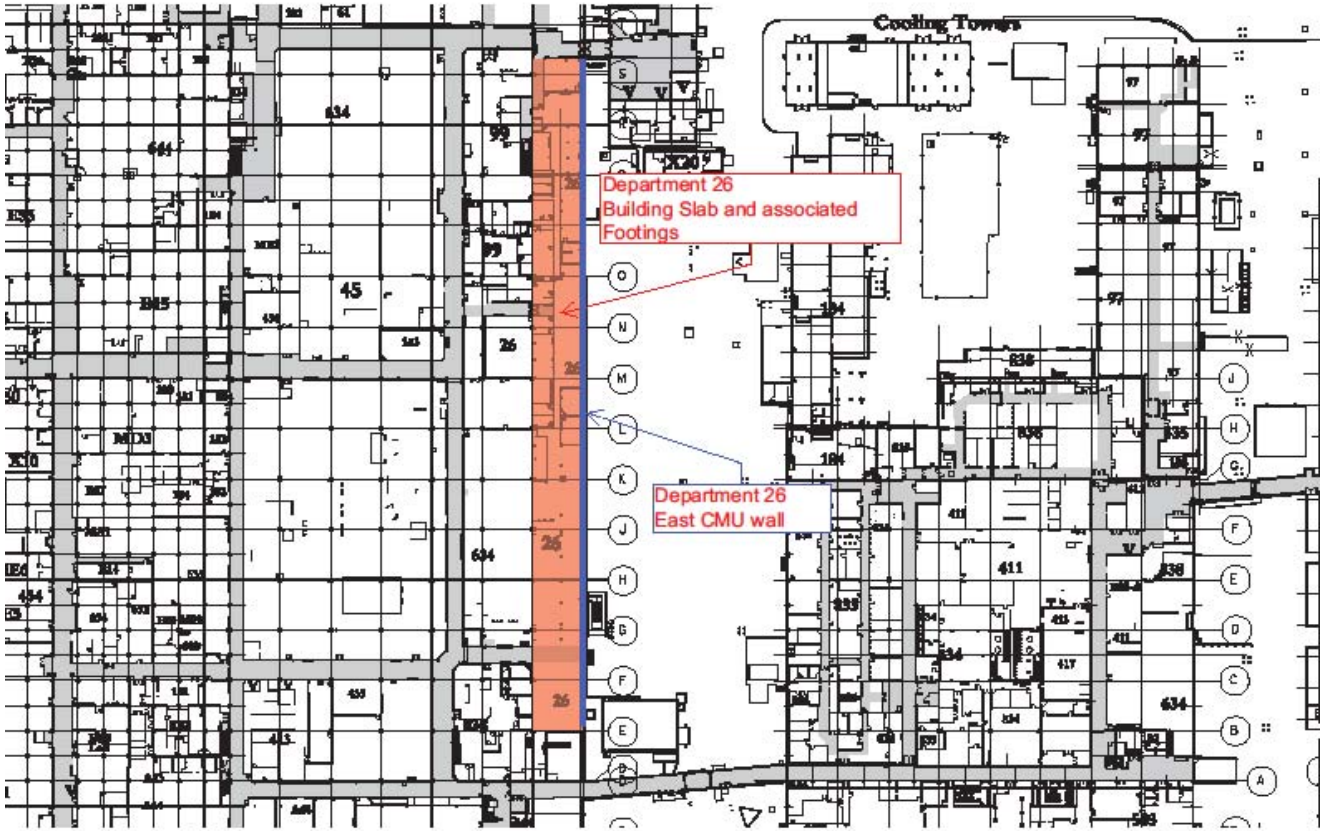
For the sake of this plan, PCB Remediation Waste is defined as any concrete, brick, or CMU block categorized as a waste stream of which material sampling would result in a PCB concentration of 50 mg/kg or more. The following are areas confirmed by results of the *Facility Environmental Assessment* and in conjunction by information from NNSA that would be considered a part of this waste stream:

Brandenburg® Industrial Service Company
2625 S. Loomis
Chicago, IL 60608
Phone (312) 326-5800
FAX (312) 326-5055

Brandenburg®

www.Brandenburg.com

- Department 26
  - East CMU Wall
  - Floor Slab and associated footings

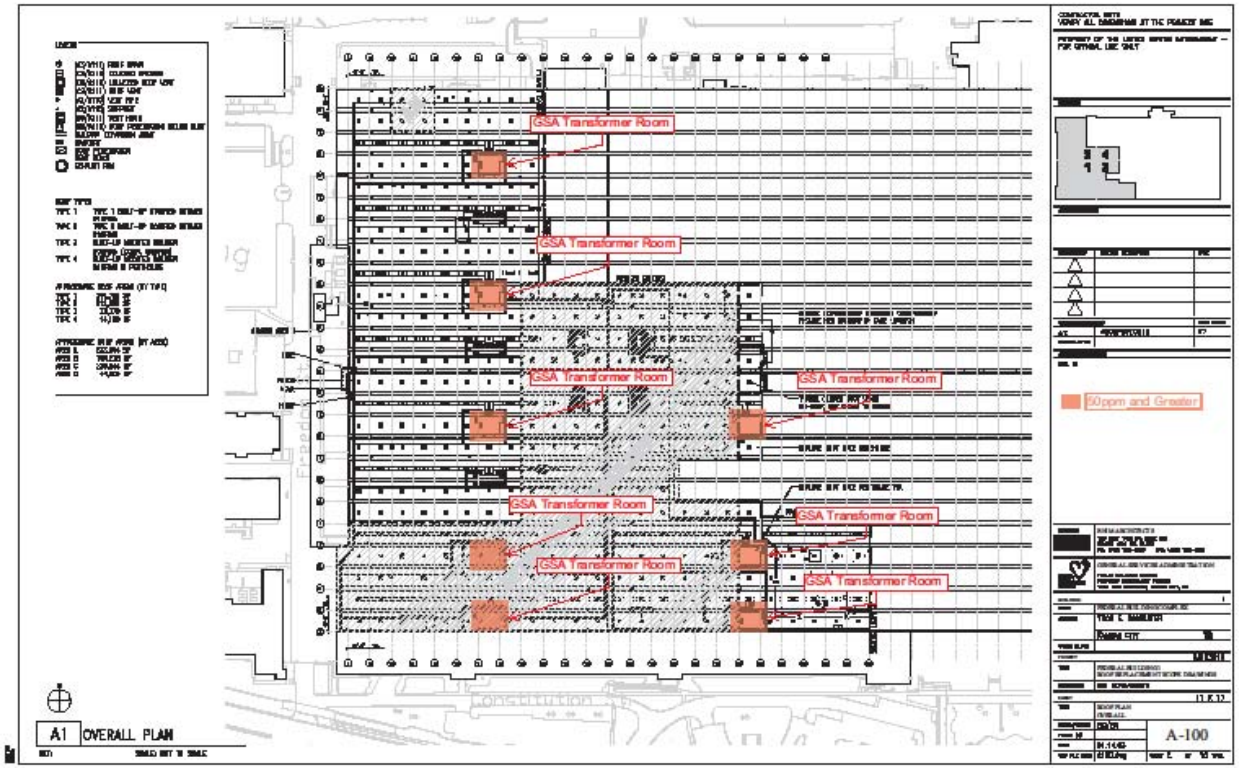


Brandenburg® Industrial Service Company
2625 S. Loomis
Chicago, IL 60608
Phone (312) 326-5800
FAX (312) 326-5055

Brandenburg®

www.Brandenburg.com

- (8) GSA Transformer Rooms

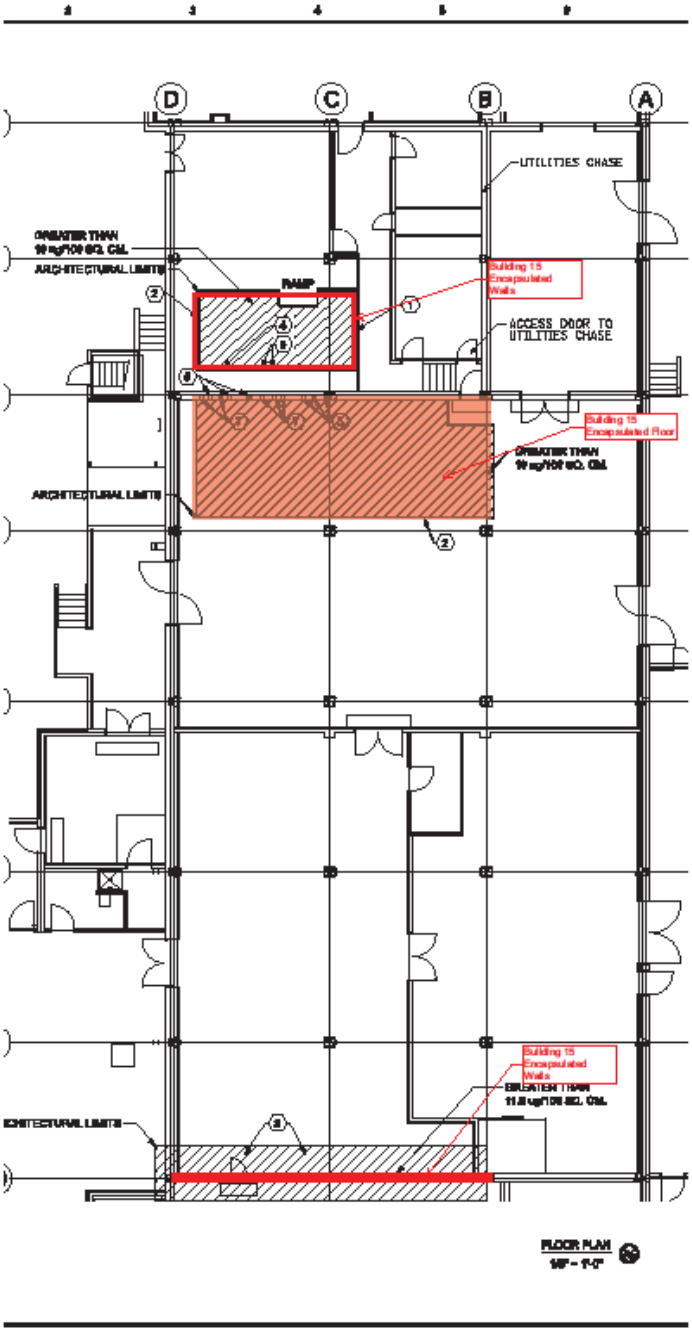


Brandenburg® Industrial Service Company
2625 S. Loomis
Chicago, IL 60608
Phone (312) 326-5800
FAX (312) 326-5055

Brandenburg®

www.Brandenburg.com

- Building 15
  - Select interior walls/floors that have been encapsulated



10.3.7.2 PCB-impacted Material

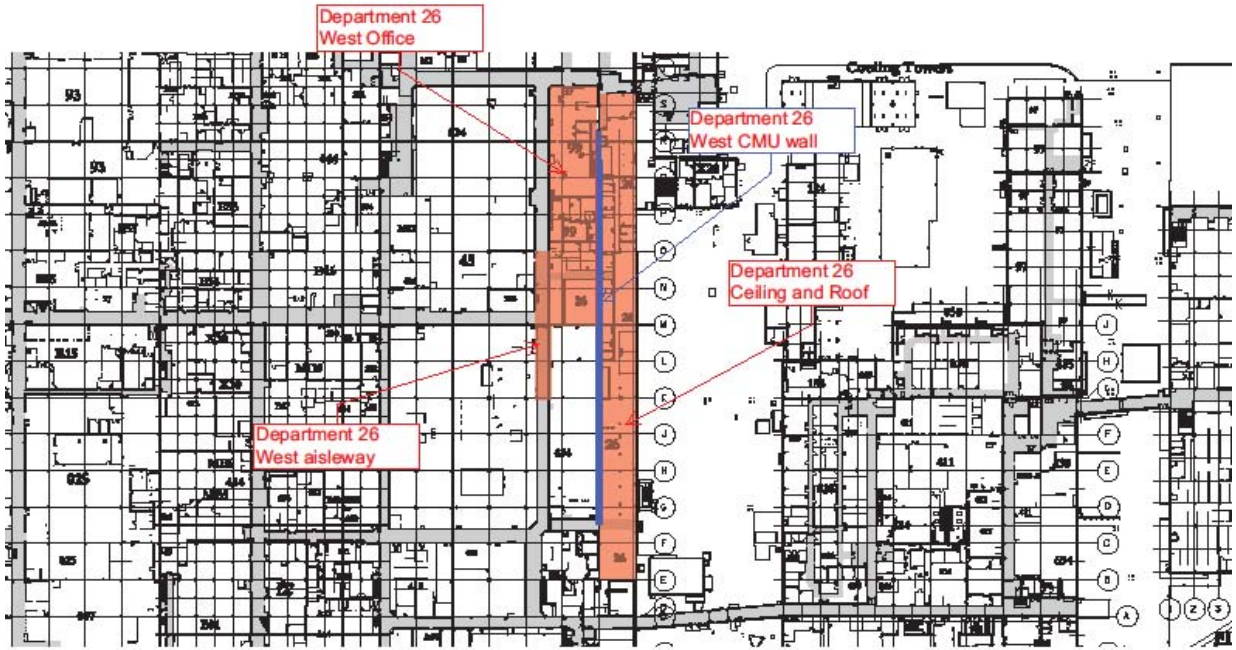
For the sake of this plan, PCB-impacted Material is definite as any concrete, brick, or CMU block categorized as a waste stream of which material sampling would result in a PCB concentration >1 mg/kg but <50 mg/kg. The following area areas confirmed by results of the *Facility Environmental Assessment* and in conjunction by information from NNSA that would be considered a part of this waste stream:

Brandenburg® Industrial Service Company
2625 S. Loomis
Chicago, IL 60608
Phone (312) 326-5800
FAX (312) 326-5055

Brandenburg®

www.Brandenburg.com

- Department 26
  - Ceiling
  - West CMU wall
  - West Office
  - West aisleway

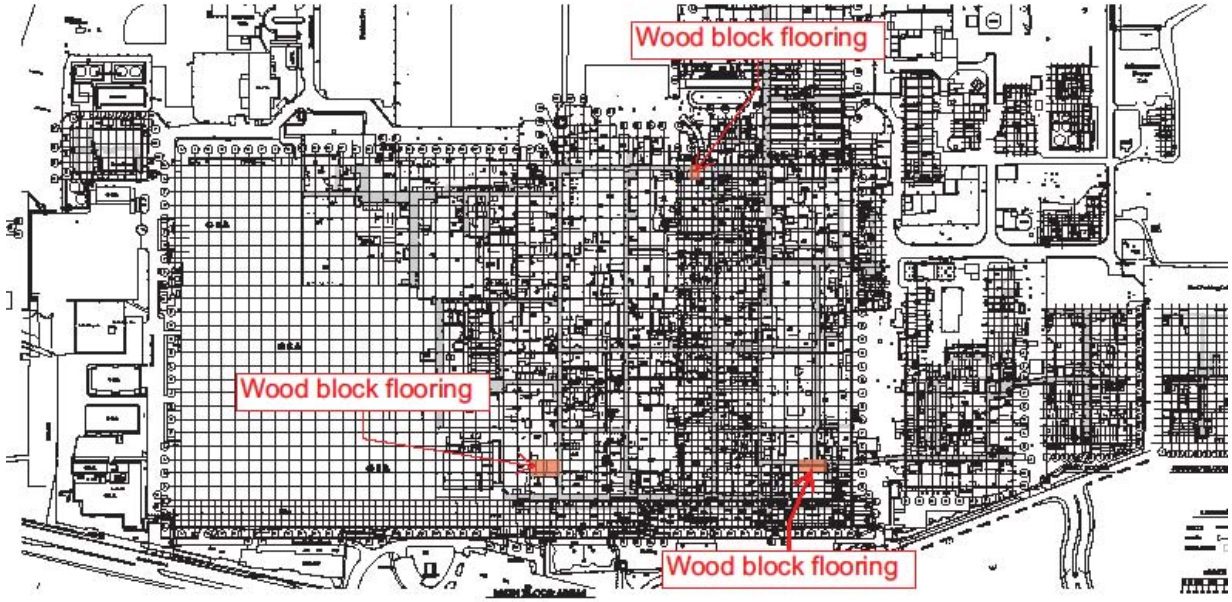


Brandenburg® Industrial Service Company
2625 S. Loomis
Chicago, IL 60608
Phone (312) 326-5800
FAX (312) 326-5055

Brandenburg®

www.Brandenburg.com

- Old Wood Block Flooring and Associated Mastic
  - Multiple Areas

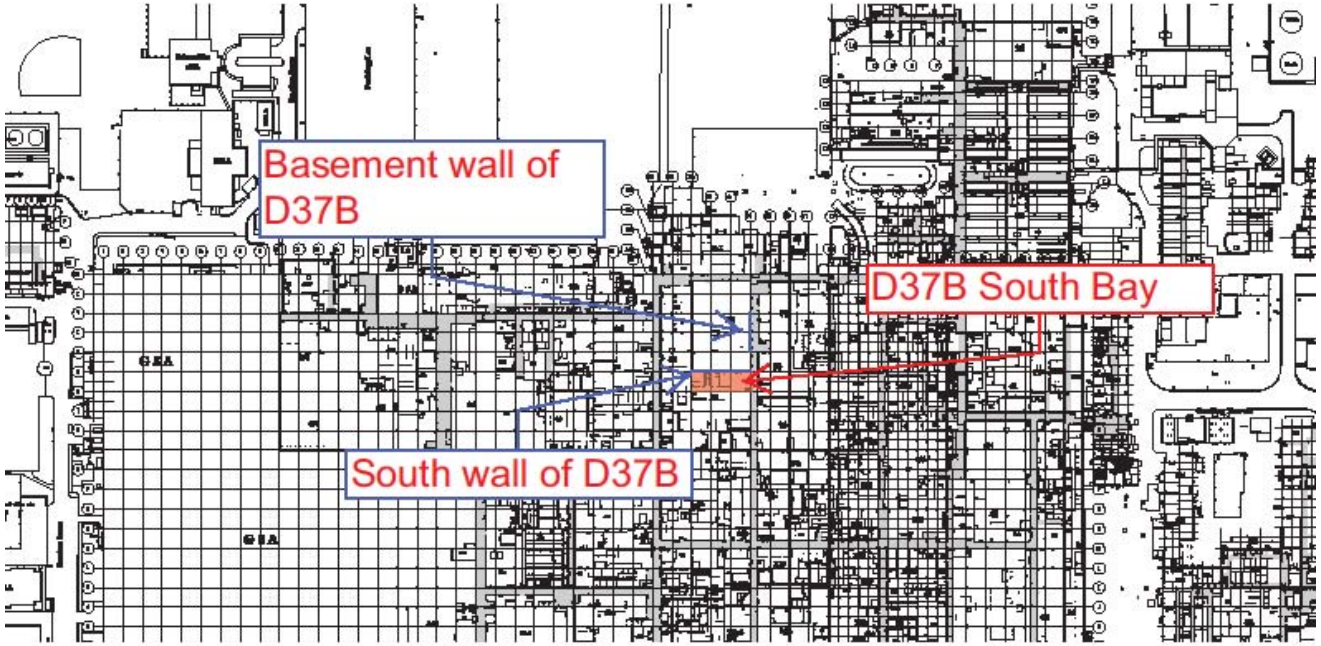


Brandenburg® Industrial Service Company
2625 S. Loomis
Chicago, IL 60608
Phone (312) 326-5800
FAX (312) 326-5055

Brandenburg®

www.Brandenburg.com

- Department 37B
  - South CMU Wall and associated south bay
  - Basement CMU Wall

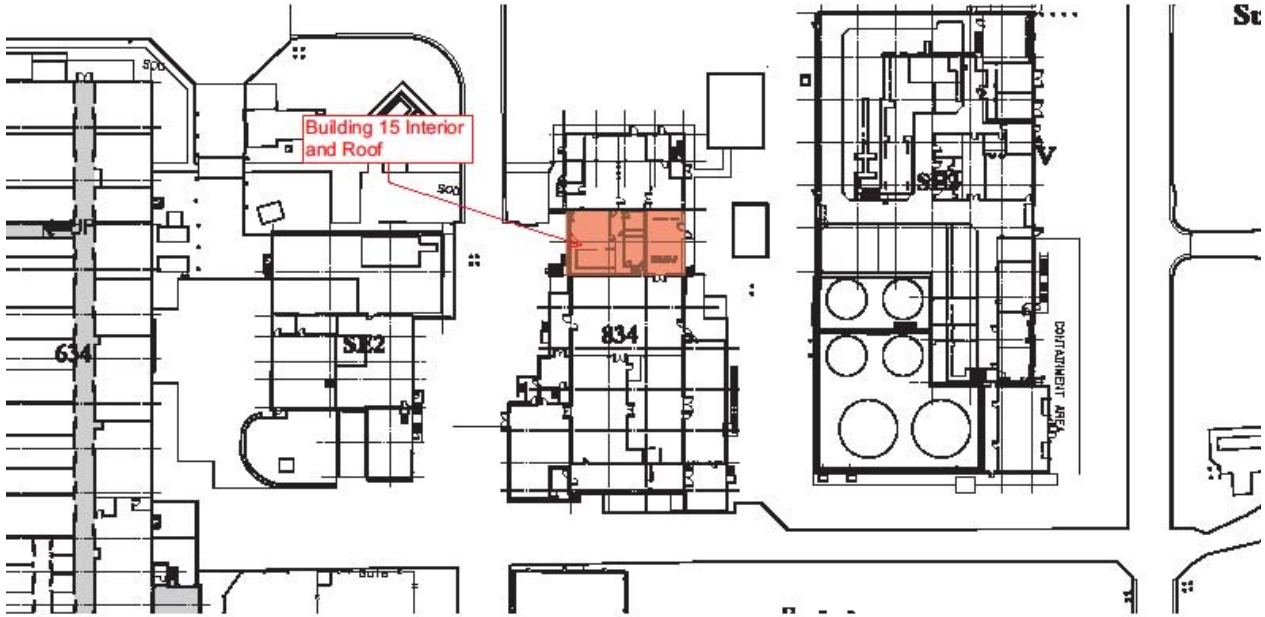


Brandenburg® Industrial Service Company
2625 S. Loomis
Chicago, IL 60608
Phone (312) 326-5800
FAX (312) 326-5055

Brandenburg®

www.Brandenburg.com

- Building 15
  - Roof
  - Select interior walls/floors and building materials



10.3.7.3 NNSA Building 1 Roof

Results of the *Facility Environmental Assessment* of the NNSA Building 1 roof membrane and mastic found levels of PCBs less than 50 mg/kg. Because of a potential increase in financial impact stemming from an attempt to segregate this material from the NNSA Building 1 roof concrete, as vertical demolition progresses, the entirety of concrete, mastic, and roof membrane of NNSA-controlled Building 1 will be segregated and sent offsite for disposal.

10.3.7.4 NNSA Building 1 Floor Slab

Results from the *Facility Environmental Assessment*s of the NNSA Building 1 concrete floor slab, in addition to information provided by NNSA, Brandenburg found levels of PCBs containing less than 50 mg/kg within a residual mastic layer approximately 2-3 inches below the surface. In addition to this information, an inspection of coring efforts by S.S. Papadopulos and Associates noted areas that displayed visual evidence of this residual mastic layer. In conjunction of three-dimensional modeling by Lutjen Inc., selective areas of this floor slab will be delineated by Brandenburg prior to floor slab removal. Upon commencement of floor slab removal, Brandenburg will segregate this material and be crushed for beneficial reuse. Based on anticipated approval from the Missouri Department of Natural Resources, this crushed material will be placed in a designated area within the original BFC footprint

10.3.8 Elevator Piston and Casing

Special care will be taken during the removal of elevator pistons and casing to prevent a release of hydraulic fluid into the groundwater. Elevator piston and casing removal will occur as follows:

- Prior to beginning vertical demolition in any area containing an elevator, all hydraulic fluid reservoirs will be drained and/or verified to be empty.
- Vertical demolition of the above grade elevator shaft and car will be performed by mechanical means to allow access to the elevator piston and casing for removal.
- The elevator piston will be extracted from the elevator casing. Any residual fluids which have drained to the casing will be pumped out and collected.
- The casing will be extracted from the boring.
- The bore hole will be closed with grout.

10.3.9 Radiation

The BFC has removed radioactive sources from the site. A confirmation survey by CenterPoint Properties Subcontractors has been completed, and the results from this survey are pending submittal and analysis. If this confirmation survey results in radiological contamination, this Plan is subject to change.

10.4 Material Segregation and Handling

Contaminated materials will be handled per the *Waste Operations Manual*. Special care will be taken so that documented environmentally impacted materials are segregated from non-impacted or recyclable materials, most commonly by selective removal of the impacted materials before removal of the non-impacted materials.

Brandenburg® Industrial Service Company
2625 S. Loomis
Chicago, IL 60608
Phone (312) 326-5800
FAX (312) 326-5055

11. VERITICAL DEMOLITION

Vertical demolition is defined herein as the physical demolition of removal of structures, equipment, or other man-made improvements to the top of slab on grade or ground elevation. The following outlines the steps and procedures to be employed during the vertical demolition process.

11.1 Work Area Preparation

Prior to commencement of vertical demolition operations in any area, the area will be regulated as a demolition or active work area. The demolition/abatement areas will be considered restricted access zones with access limited only to those required to support project specific activities. Any required, access to the area will be coordinated and communicated with the Field Supervisor. Individual work areas will be demarcated with temporary fencing, caution/danger tape, or barriers as required. Appropriate signage will be displayed to identify the limits of the work zone and to notify site personnel of the area's status as an active demolition/work site.

Before beginning work that has the potential to cause a release from the site (line breaking, demolition of pipe racks, etc), spill containment countermeasures such as plugging of local chemical sewer drains and protecting local storm water drains will be implemented.

11.2 Demolition Equipment

Major equipment (with quantify) to be used on site in the performance of the demolition and abatement scope of work will be identified and listed as a future revision to this work plan. Examples of this equipment and estimated quantities are as follows:

Brandenburg® Industrial Service Company
2625 S. Loomis
Chicago, IL 60608
Phone (312) 326-5800
FAX (312) 326-5055

Brandenburg®

www.Brandenburg.com

Liebherr 984 Hydraulic Excavator with universal attachments (grapple, bucket, hydraulic hammer, cutting shear, etc)
Estimated Quantity: 1-2

Brandenburg® Industrial Service Company
2625 S. Loomis
Chicago, IL 60608
Phone (312) 326-5800
FAX (312) 326-5055

Brandenburg®

www.Brandenburg.com

Liebherr 954 Hydraulic Excavator with universal attachments (grapple, bucket, hydraulic hammer, cutting shear, concrete jaw processor, etc)
Estimated Quantity: 10-12

Liebherr 924 Hydraulic Excavator with universal attachments (grapple, bucket, hydraulic hammer, cutting shear, etc)
Estimated Quantity: 3-5

Brandenburg® Industrial Service Company
2625 S. Loomis
Chicago, IL 60608
Phone (312) 326-5800
FAX (312) 326-5055

Brandenburg®

www.Brandenburg.com

Kamatsu 430/500 Front-end Wheel Loaders
Estimated Quantity: 5-6

5-6 Caterpillar 973 Front-end Track Loader
Estimated Quantity: 5-6

Brandenburg® Industrial Service Company
2625 S. Loomis
Chicago, IL 60608
Phone (312) 326-5800
FAX (312) 326-5055

Brandenburg®

www.Brandenburg.com

Bobcat Skid Steer Loaders with universal attachments (biter bucket, cutting shear, hydraulic hammer, etc)
Estimated Quantity: 8-10

Concrete Crusher
Estimated Quantity: 2-3

Brandenburg® Industrial Service Company
2625 S. Loomis
Chicago, IL 60608
Phone (312) 326-5800
FAX (312) 326-5055

Brandenburg®

www.Brandenburg.com

DustBoss articulating mister
Estimated Quantity: 4-5

Brandenburg Dump Trailer
Estimated Quantity: 5-10

Brandenburg® Industrial Service Company
2625 S. Loomis
Chicago, IL 60608
Phone (312) 326-5800
FAX (312) 326-5055

Brandenburg®

www.Brandenburg.com

Railcar
Estimated Quantity: 50-100

Off-road Dump Trailers
Estimated Quantity: 3-5 (variable)

Brandenburg® Industrial Service Company
2625 S. Loomis
Chicago, IL 60608
Phone (312) 326-5800
FAX (312) 326-5055

Brandenburg®

www.Brandenburg.com

Liebherr PR 754 Dozer
Estimated Quantity: 3-4

Brandenburg Rolloff Toolbox
Estimated Quantity: 5-7

Brandenburg® Industrial Service Company
2625 S. Loomis
Chicago, IL 60608
Phone (312) 326-5800
FAX (312) 326-5055

Brandenburg®

www.Brandenburg.com

Manlift
Estimated Quantity: 8-10

Miscellaneous Support Equipment: Burning cart/skid, Air Compressor, Fuel Skid, etc
Estimated Quantity: Various

11.3 Interior Demolition & Preparation

Where applicable, vertical demolition operations will begin by removing all non-recyclable construction and demolition debris from the structures to be demolished. Examples include removing tenant debris or drywall partitions walls from structures otherwise composed of concrete and/or steel. In certain areas, piping or equipment located within structures to be demolished may be selectively removed before demolition where these activities would increase the efficiency of gross demolition operations. This work will be performed by laborers and skid steer loaders. The removal of these materials will facilitate the structural demolition by reducing the number of components that need to be segregated from the debris pile and minimizing the amount of debris that must be shipped to the landfill.

11.4 Structural Demolition

The demolition of structures at the Site will be a mechanized effort performed using the equipment described previously. Sequencing and work flow information is provided in Section 11.6 and per the construction sequence plan drawing provided as a supplemental reference document to this Plan.

Primary dismantlement of structures, tanks, and equipment will be performed by hydraulic excavators outfitted with shears and/or mechanical grapple attachments. The structural members will be systematically dismantled from top to bottom. Structural members may be cut and dropped, or grabbed and folded to facilitate removal from the structure by a hydraulic shear or grapple. The sequence and locations of the physical removal process will be dictated by the Field Supervisor's and heavy equipment operator's judgment. Dismantlement of structures will proceed in a bay-by-bay manner. Prior to the end of each work shift, the area will be evaluated by the Field Supervisor for any potentially unsafe conditions (i.e. loose siding). No persons will access the work area during off work hours, unless escorted by authorized personnel.

11.5 Material Segregation and Handling

During the course of dismantlement, debris will be segregated into three primary components:

- Concrete/brick/CMU block to be recycled,
- Metallic Debris to be recycled, and
- General Construction and Demolition debris (C&D), which will be disposed at a landfill.

The machine used for the primary dismantling will be used to perform the first level of segregation during the demolition process. Structural members will be segregated from the remaining debris and stockpiled as dismantled. Where removed intact, other components (e.g. concrete floor sections) may be segregated at the point of dismantlement.

The remaining materials will be demolished into a debris field adjacent to the area of active demolition. Debris will not be placed in SWMUs, AOCs, or RCRA areas. The

Brandenburg® Industrial Service Company
2625 S. Loomis
Chicago, IL 60608
Phone (312) 326-5800
FAX (312) 326-5055

second level of segregation will be performed using a series of machines assisting the primary demolition excavator. Wheeled loaders with biter buckets, excavators with grapples, and skid steers will be used to remove and segregate the building components from the debris field into the waste/recyclable product components described previously.

Metallic debris will be loaded directly onto a truck for offsite recycling or transported by truck or wheel loader for further segregation and sizing. Recyclable concrete, brick and block will be stockpiled within the demolition area and live-loaded into trucks for offsite recycling or recycled onsite via portable crushing plant(s). C&D material, including small pieces of concrete/brick/block, which are unable to be cost-effectively segregated, will likewise be stockpiled within the demolition area and live-loaded into trucks for off-side disposal at a landfill as designated in the Waste Operations Manual.

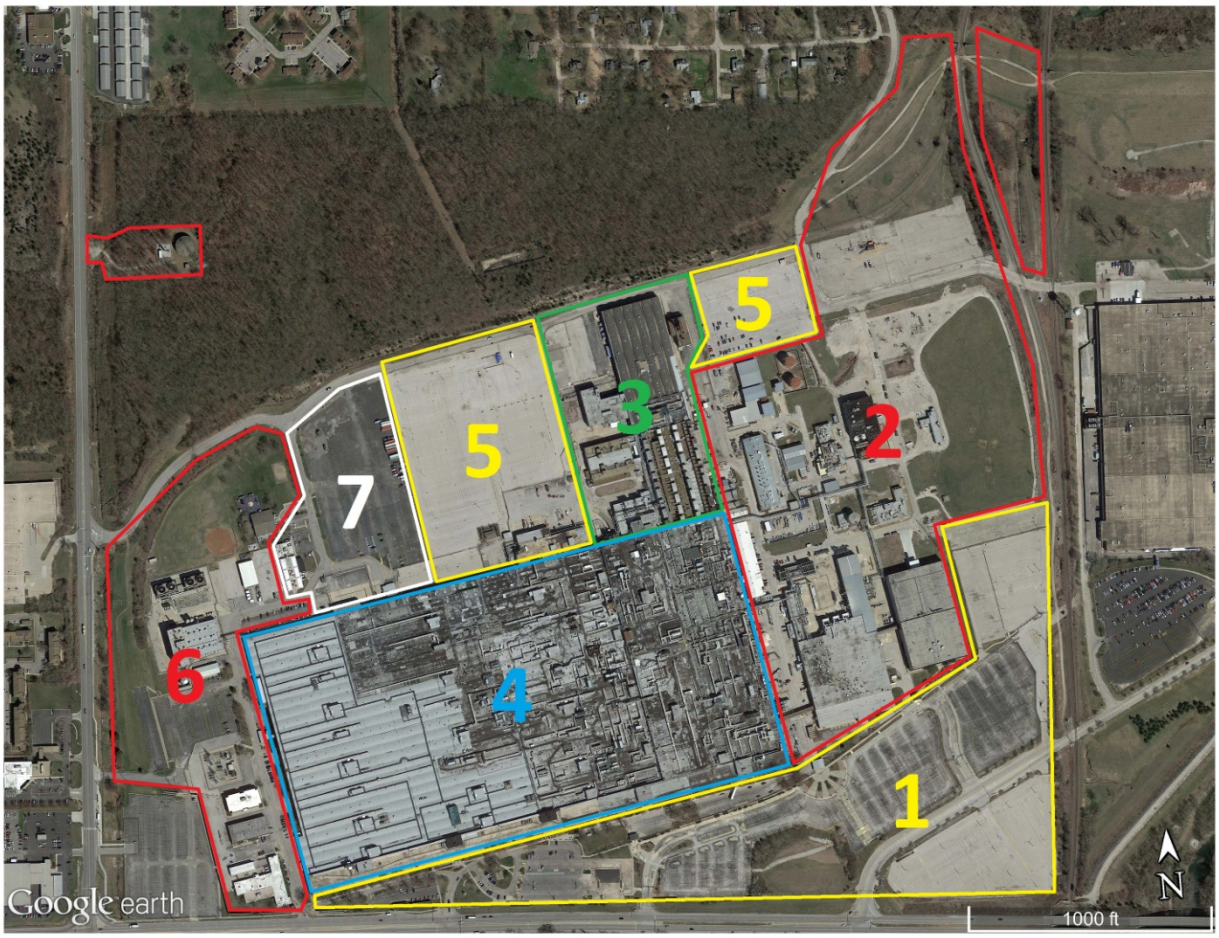
Brandenburg® Industrial Service Company
2625 S. Loomis
Chicago, IL 60608
Phone (312) 326-5800
FAX (312) 326-5055

11.6 Vertical Demolition Sequence

To help organize the dismantlement effort, the vertical demolition will be organized into a series of sections or phases. Below is a drawing illustration the location of this phasing. The sequence of work will be detailed and updated as necessary in the master project schedule.

The major goals of the vertical demolition sequencing plans are as follows:

- Develop a flow of work that will allow the project to be completed safely
- Work in multiple concurrent areas to maximize resources and decrease overall schedule length
- Allow for earliest start possible on structural demolition activities
- Develop a sequence within each phase that will allow hazardous/environmentally impacted removals to be performed as a standalone task before gross demolition to eliminate potential for cross contamination of debris and allow for efficiency of demolition operations.



11.7 Site Utility Removal

Non-contaminated underground utility systems include electrical, fire protection, sanitary, and potable water systems. The location of these systems can be found on drawings provided by CenterPoint Properties. These utility systems will be located in the field, removed from service, and where applicable, capped and abandoned in place. Removal of all the aforementioned utilities will take place within a 12 foot depth from grade. Soil will be excavated to field locate the utility will be removed, and the resulting clean fill will be placed back into the excavation. Utilities located deeper than 12 feet will be cut and capped or filled with controlled low-strength material as referenced in documentation provided by Lutjen Inc. Should any undocumented branches or systems be uncovered during the excavation process, they will be reported to Lutjen Inc. and documented. A an overall summary of excavation quantities is included as part of this Plan.

11.7.1 Site Utility Contaminated Soil

During the site utility excavation process, below-grade utility footprints will be compared to that of the Final RCRA Corrective Measures Plan by S.S. Papadopulos and Associates. If a utility is to be removed within the footprint of impacted soil, the resulting excavated soil will be classified in conjunction with the *Waste Operations Manual,* and hauled offsite for disposal.

11.7.2 Site Utility Contaminated Bedding

Contaminated media has been known to circulate through the following BFC utilities:

- Industrial Wastewater
- Storm Sewer
- Sanitary Sewer

Examples of the constituents in these systems include PCBs and chlorinated solvents. Upon excavation and removal of these utilities, the bedding below the utility footprint will be characterized in conjunction with the *Waste Operations Manual* and RCRA Corrective Measures Plan, and hauled offsite for disposal.

11.7.3 Underground Storage Tanks (USTs)

While in production, the BFC operated a number of underground storage tanks. According to NNSA, many underground storage tank systems have been closed; however, a number of tank system closures did not remove the tank system. As a part of this Plan, Brandenburg will file the necessary permits and notifications with the State of Missouri and City of Kansas City and remove the remaining UST systems.

11.8 Identification of Impacted Soils for Removal

The Corrective Measures Plan identifies potentially impacted soils in SWMUs or AOCs that will be evaluated as they are exposed. S.S. Papadopulos & Associates, Inc will complete field screening procedures in areas designated for removal as part of this Plan

as the soil is exposed. The *Waste Operations Manual* provides procedures to be followed for segregating, storing, and disposal of suspect and confirmed contaminated soils.

11.9 Backfilling Excavations

All excavations will be backfilled as soon as practical after completion of removal work. Planning and sequencing will be used to coordinate horizontal demolition and other land disturbing activities so that no more than 50 acres is disturbed at one time. New backfill material will meet the material specifications for backfill will be obtained in the following order of precedent:

- Excavation spoils from excavation to be backfilled
- Excess or overburden material from within the same grading zone in which the backfill is being performed or from an area onsite but outside of the grading zone boundaries
- Imported fill material from offsite source(s)

Backfill material obtained from a designated grading zone other than the grading zone in which the backfill work is being performed may be used. Backfilling of excavations will occur as follows:

- Fill material will be placed in the excavation in 8-inch lifts with +/- 6 inch flexibility
- Fill material will be compacted by vibratory roller or excavator mounted plate compactor to 90% compaction in the upper 3 feet of backfill and 95% compaction below 3 feet of maximum dry density
- Excavations will be backfilled up to within +/- 6 inches of adjacent grade elevation providing that no ponding of water shall be allowed.

Brandenburg® Industrial Service Company
2625 S. Loomis
Chicago, IL 60608
Phone (312) 326-5800
FAX (312) 326-5055

12.0 SITE GRADING

This section describes the requirements for rough grading following demolition activities. Final site grading will be completed on an ongoing basis. Erosion control measures will be installed by Brandenburg before land disturbing activities. Final inspection of the site by Kansas City will be coordinated by Brandenburg before removal of erosion and sediment control provisions.

12.1 Clean Fill

Clean concrete compatible for reuse or acceptable off site borrow sources will be suitable material for onsite grading operations. Concrete will be crushed through multiple onsite mobile crushing plants to various volumes of 6” minus, 3” minus, and crusher run according to material requirements specified in subsequent documentation from Lutjen Inc.

The specified requirements for quality control testing of proposed fill materials will be conformed to during placement. Imported fill must be certified clean.

12.2 Slope Requirements

Areas within the limits of grading will be constructed to maintain positive drainage and a maximum slope of 3 horizontal to 1 vertical in rough grading areas. Additional grading, sloping, and compaction will be at the direction of CenterPoint Properties and/or its Subcontractors.

12.3 Items to be Protected

Groundwater monitoring wells, piezometers and remediation system components to remain will be protected throughout grading activities. Final grades may be adjusted through coordination with CenterPoint Properties, in localized areas surrounding these features so long as positive drainage is achieved and the features remain functional and accessible.

Brandenburg® Industrial Service Company
2625 S. Loomis
Chicago, IL 60608
Phone (312) 326-5800
FAX (312) 326-5055

13.0 SITE SURVEYING

This section describes the procedures for the control and documentation of the lines and elevations of the work. As-built survey documentation is described in Section 14 of this Plan.

13.1 Surveying Requirements

Surveys of the site will:

- Utilized recognized engineering survey practices appropriate for the work to be performed
- Located and protect survey control and reference points
- Replace any dislocated survey reference points based on original survey control
- Establish elevations, lines, levels, and temporary benchmarks required to execute the work
- Be prepared by, and signed and sealed by a Registered Professional Land Surveyor licensed in the State of Missouri.

13.2 Surveying of Disturbed Acreage

Prior to any demolition activities, an initial topographic survey will be conducted to document baseline site conditions and surface elevations. During demolition, contracted surveys will be onsite to maintain disturbed acreage as demolition proceeds, in accordance with the land disturbance permit requirements. The ongoing measurements will allow for a continually updated sum of the disturbed acreage which will be used to determine when and where restoration is needed to ensure that no more than 50 acres are disturbed at any time.

Brandenburg® Industrial Service Company
2625 S. Loomis
Chicago, IL 60608
Phone (312) 326-5800
FAX (312) 326-5055

14.0 AS-BUILT DOCUMENTATION

This section describes the as-built documentation that will be provided for the construction of permanent features.

14.1 As-built Documentation

For constructed permanent features, as-built documentation will be prepared and submitted to CenterPoint properties including, but not limited to, the following:

- Construction photographs
- Compiled copies of regular reports submitted to the regulatory agencies during the Work
- Warranties, if applicable
- As-built surveys

As-built drawings and documentation will be submitted for review and approval at milestones to be mutually agreed upon by CenterPoint Properties, its Subcontractors, and Brandenburg. Electronic files of the as-built drawings in AutoCAD format will be submitted.

14.2 As-built Surveys

As-built surveys will be performed in accordance with the minimum survey requirements included in Section 13 of this Plan and will include the following information:

- Appropriate scale and North arrow
- Property boundary
- Benchmarks
- Other appropriate reference information

As-built surveys will be prepared to document the following components of the Work:

- Modifications to the existing groundwater systems (location, alignment, and other pertinent data for related piping)
- Elevations of graded areas. Topographic surveys will be prepared for each area, as it is completed and will be combined to represent the overall grading completed at the time of Substantial Completion of the Work. At a minimum, surface elevations will be collected on a 100-foot grid pattern. Survey data will also be collected at the top and bottom of all slopes, drainage ditches, stormwater pond berms, and at other locations required to define grades
- Locations and limits of areas of visibly contaminated soil, including locations of samples and other information required by information and documentation provided by S.S. Papadopolus and Associates.
- Permanent benchmarks

Brandenburg® Industrial Service Company
2625 S. Loomis
Chicago, IL 60608
Phone (312) 326-5800
FAX (312) 326-5055

15.0 DEMOBILIZATION

This section provides a description of demobilization procedures following the completion of demolition activities.

15.1 Removal of Equipment and Materials

During demolition, Lutjen Inc. will be notified of materials and/or oil filled equipment containing greater than 55 gallons that are removed from Site to assist with updating the Site's SPCC Plan based on current Site conditions.

15.2 Removal of Temporary Facilities and Materials

The temporary field office trailers and security trailers, as well as associated temporary utilities, will be removed as part of demobilization activities, excluding that which is agreed upon with CenterPoint Properties and/or its Subcontractors.

15.3 Cleaning of the Site

Debris shall be removed from the site in an ongoing effort upon the initiation of demolition. All debris will be removed from each area after the completion of horizontal demolition and before final grading/restoration in that area. Prior to demobilization, all remnant debris generated from the demolition work shall be removed from the Site. A walk-through will be conducted with CenterPoint Properties representative(s) in advance of the scheduled demobilization to ensure that this has been performed to a satisfactory condition.

15.4 Site Maintenance

The Site will be maintained until a Notice of Substantial Completion is issued by CenterPoint Properties.

15.5 Required Documentation

The NPDES Notice of Termination (NOT) or any modifications to this permit will be prepared by others.

Brandenburg® Industrial Service Company
2625 S. Loomis
Chicago, IL 60608
Phone (312) 326-5800
FAX (312) 326-5055

Brandenburg®

www.Brandenburg.com

RCRA HEAVY METAL SUMMARY

Date	Test #	Building #	Section & Floor	Location	Int (I) Ext (E)	Substrate	Rough (R) Smooth (S)	Color	Type Gloss (G) Flat (F)	As (ppm)	Ba (ppm)	Cd (ppm)	Cr (ppm)	Hg (ppm)	Se (ppm)	Ag (ppm)
12/17/2014	77	1	Basement	C	I	Cement Wall	S	Beige	F	0.98	0	0	51.9	0	0	0
12/17/2014	78	1	Basement	C	I	Cement Wall	S	Beige	F	0	0	2.2	64.8	0	0.01	0
12/17/2014	79	1	Basement	C	I	Cement Floor	S	Grey	F	0	0	0	0	0	0	0
12/17/2014	80	1	Basement	C	I	Cement Floor	S	Grey	F	0	0	0	0	0	0	0
12/17/2014	81	1	Basement	C	I	Cement Block Wall	S	Beige	F	0	0	6.9	66.1	0.34	0.02	0
12/17/2014	82	1	Basement	C	I	Cement Wall	S	Beige	F	0	0	2.7	10	0	0.7	0
12/17/2014	83	1	Basement	C	I	Cement Block Wall	S	Beige	F	0	0	3.1	51	0.01	0.11	0
12/17/2014	84	1	Basement	C	I	Cement Floor	S	Grey	F	0	0	0	0	0	0	0
12/17/2014	85	1	Basement	Stair Rail	I	Cement Hand Rail	S	Beige	F	0	0	0	801.7	0	0	0
12/17/2014	86	1	Basement	Srair Step	I	Cement Stair	S	Tan	F	0	0	0	49.2	0	0	0
12/17/2014	87	1	Basement	C	I	Cement Block Wall	S	Beige	F	0	0	0	6.2	0	0	0
12/17/2014	88	1	Basement	C	I	Cement Block Wall	S	Beige	F	0	0	17.2	3.7	0	0	0
12/17/2014	89	1	Basement	C	I	Cement Wall	S	Beige	F	0	0	0	0	0	0	0
12/17/2014	90	1	Basement	C	I	Cement Floor	S	Grey	F	0	0	0	0	0	0	0
12/17/2014	91	1	Basement	C	I	Cement Wall	S	Tan	F	0	0	0	0.89	0	0	0
12/17/2014	92	1	Basement	C	I	Brick Wall	S	Beige	F	0	0	0	10.21	0	0	0
12/17/2014	93	1	Basement	C	I	Cement Block Wall	S	Beige	F	0	0	0	0	0	0	0
12/17/2014	94	1	Basement	C	I	Brick Wall	S	Beige	F	0	0	0	0	0	0	0
12/17/2014	95	1	Basement	C	I	Cement Block Wall	S	Beige	F	0	0	0	0	0	0	0
12/17/2014	96	1	Basement	C	I	Cement Block Wall	S	Beige	F	0	0	0	0	0	0	0
12/17/2014	97	1	Basement	C	I	Cement Block Wall	S	Beige	F	0	0	0	18.1	0	0	0
12/17/2014	98	1	Basement	C	I	Cement Column	S	Beige	F	0	0	4.1	0	0	0	0
12/17/2014	99	1	Basement	C	I	Cement Block Wall	S	Beige	F	0	0	0	0	0	0	0
12/17/2014	100	1	Basement	C	I	Cement Block Wall	S	Beige	F	0	0	0	0	0	0	0
12/17/2014	101	1	Basement	C	I	Cement Block Wall	S	Beige	F	0	0	0	0	0	0	0
12/17/2014	102	1	Basement	A	I	Cement Block Wall	S	Beige	F	0	0	0	0	0	0	0
12/17/2014	103	1	Basement	A	I	Cement Floor	S	Grey	F	0	0	0	0	0	0	0
12/17/2014	104	1	Basement	A	I	Cement Block Wall	S	Light Grey	F	0	590	0	0	0	0.03	0.22
12/17/2014	105	1	Basement	A	I	Cement Column	S	Light Grey	F	0	610	0	0	0	0	0
12/17/2014	106	1	Basement	A	I	Cement Block Wall	S	Light Grey	F	0	700	0	14.8	0.56	0.07	0
12/17/2014	107	1	Basement	A	I	Cement Block Wall	S	Light Grey	F	0	54	0	19.1	0.01	0.01	0
12/17/2014	108	1	Basement	A	I	Cement Block Wall	S	Light Grey	F	0	190	0	46	0	0	0
12/17/2014	109	1	Basement	A	I	Cement Block Wall	S	Light Grey	F	0	617	0	33.9	0	0	0
12/17/2014	110	1	Basement	A	I	Cement Wall	S	Beige	F	0	0	0	0	0	0	0
12/17/2014	111	1	Basement	Men's Locker	I	Cement Block Wall	R	Beige	F	0	0	0	0	0	0	0
12/17/2014	112	1	Basement	B	I	Cement Block Wall	R	Mint Green	F	0	89	68.7	499.6	0	0	0
12/17/2014	113	1	Basement	B	I	Cement Block Wall	R	Beige	G F	0	0	0	37	0	0	0
12/17/2014	114	1	Basement	B	I	Cement Wall	S	Beige	F	0	0	0	40.5	0	0	0

Date	Test #	Building #	Section & Floor	Location	Int (I) Ext (E)	Substrate	Rough (R) Smooth (S)	Color	Type Gloss (G) Flat (F)	As (ppm)	Ba (ppm)	Cd (ppm)	Cr (ppm)	Hg (ppm)	Se (ppm)	Ag (ppm)
12/17/2014	115	1	Basement	B	I	Cement Floor	S	Light Grey	G	0	107	0	0	0	0	0
12/17/2014	116	1	Basement	B	I	Cement Wall	S	Tan	F	0	0	0	0	0	0	0
12/17/2014	117	1	Basement	B	I	Brick Wall	S	Tan	G	0	0	0	0	0	0	0
12/17/2014	118	1	Basement	B	I	Cement Block Wall	R	Beige	F	0	0	2.3	0	0	0	0
12/17/2014	119	1	Basement	B	I	Cement Block Wall	R	Beige	F	0	0	1.1	0	0	0	0
12/17/2014	120	1	Basement	B	I	Cement Block Wall	R	Beige	F	0	0	6.2	0	0	0	0
12/17/2014	121	1	Basement	B	I	Cement Floor	S	Grey	G	0	780	0	212	0	0	0.34
12/17/2014	122	1	Basement	B	I	Cement Floor	S	Grey	G	0	901	0	0	0	0	0
12/17/2014	123	1	Basement	B	I	Cement Block Wall	R	Baby Blue	F	0	312	0	0	0	0	0
12/17/2014	124	1	Basement	B	I	Cement Block Wall	R	Beige	F	0	0	0	0	0	0	0
12/17/2014	125	1	Basement	D	I	Cement Block Wall	R	Yellow	F	0	891	0	897.1	0	0	0
12/17/2014	126	1	Basement	D	I	Cement Block Wall	R	Green	F	0	68	0	419	0	0	0
12/17/2014	127	1	Basement	D	I	Cement Block Wall	R	Blue	F	0	271	0	30	0	0.039	0
12/17/2014	128	1	Basement	D	I	Cement Block Wall	R	Yellow	G F	0	900	0	601.7	0	0	0
12/17/2014	129	1	Basement	D	I	Cement Floor	S	Grey	G	0	91	0	0	0	0	0
12/17/2014	130	1	Basement	D	I	Cement Block Wall	R	Beige	F	0	0	3.1	32	0	0	0
12/17/2014	131	1	Basement	D	I	Cement Block Wall	R	Beige	F	0	0	2.7	438	0	0	0
12/17/2014	132	1	Basement	Bottom	I	Cement Block Wall	R	Beige	F	0	0	9.5	23	0	0	0
12/17/2014	133	1	Basement	Top	I	Cement Block Wall	R	Tan	F	0	0	0	0	0	0	0
12/17/2014	134	1	Basement	D	I	Brick Wall	R	Tan	F	0	0	0	286	0	0	0
12/17/2014	135	1	Basement	D	I	Cement Block Wall	R	Tan	F	0	0	0	0	0	0	0
12/17/2014	136	1	Basement	D	I	Cement Floor	S	Maroon	F	0	0	31	441	0.04	0	0
12/17/2014	137	1	Basement	D	I	Cement Wall	S	Beige	F	0	0	8.8	0	6	0	0
12/17/2014	138	1	Basement	D	I	Cement Block Wall	R	Beige	F	0	13	14.3	77	7.3	0	0
12/17/2014	139	1	Basement	D	I	Cement Block Wall	R	Tan	F	0	0	0	416	5.5	0	0
12/17/2014	140	1	Basement	Bottom	I	Cement Block Wall	R	Tan	F	0	0	0	385	6.1	0	0
12/17/2014	141	1	Basement	Top	I	Cement Block Wall	R	Beige	F	0	0	0	340	1.2	0	0
12/17/2014	142	1	Basement	CD	I	Cement Block Wall	R	Beige	F	0	0	0	283	0.09	0	0
12/17/2014	143	1	Basement	AB	I	Cement Block Wall	R	Beige	F	0	0	0	298	3.1	0	0
12/22/2014	23	1	Basement	O - 27	I	Brick Wall	R	Biege	F	0	0	0	0	0	0	0
12/22/2014	24	1	Basement	O -28	I	Cement Floor	S	Biege	F	0	0	0	0	0	0	0
12/22/2014	25	1	Basement	P - 27	I	Cement Block Wall	R	Biege	F	0	0	0	465	0	0	0
12/22/2014	26	1	Basement	P - 28	I	Cement Block Wall Bottom	R	Green	F	0	325	13.9	0	0	0	0
12/22/2014	27	1	Basement	P - 29	I	Cement Block Wall Top	R	Biege	F	0	0	0	0	0	0	0
12/22/2014	28	1	Basement	P - 30	I	Cement Block Wall	R	Biege	F	0	0	0	0	0	0	0
12/22/2014	29	1	Basement	P - 31	I	Cement Floor	S	Gray	F	0	10.5	0	0	0	0	0
12/22/2014	30	1	Basement	P - 32	I	Cement Block Wall	R	Biege	F	0	0	0	0	0	0	0
12/22/2014	31	1	Basement	P - 33	I	Cement Block Wall Bottom	R	Tan	F	0	0	0	127	0	0	0
12/22/2014	32	1	Basement	P - 34	I	Cement Block Wall Top	R	Biege	F	0	0	0	0	0	0	0
12/22/2014	33	1	Basement	A - 31	I	Cement Block Wall Bottom	R	Tan	F	0	0	0	0	0	0	0

Date	Test #	Building #	Section & Floor	Location	Int (I) Ext (E)	Substrate	Rough (R) Smooth (S)	Color	Type Gloss (G) Flat (F)	As (ppm)	Ba (ppm)	Cd (ppm)	Cr (ppm)	Hg (ppm)	Se (ppm)	Ag (ppm)
12/22/2014	34	1	Basement	A - 30	I	Cement Block Wall Top	R	Biege	F	0	0	0	0	0	0	0
12/22/2014	35	1	Basement	B - 30	I	Collumn Steal Beam	S	Blue	F	0	0	0	182	0	0	0
12/22/2014	36	1	Basement	C - 30	I	Cement Floor	S	Maroon	F	0	8.7	40.1	684	0	0	0
12/22/2014	37	1	Basement	D - 31	I	Cement Block Wall Top	R	Biege	F	0	0	0	0	0	0	0
12/22/2014	38	1	Basement	D - 30	I	Cement Block Wall Bottom	R	Tan	F	0	0	0	0	0	0	0
12/22/2014	39	1	Basement	F - 30	I	Cement Floor	S	Gray	F	0	101	0	332	0	0	0
12/22/2014	40	1	Basement	H - 30	I	Cement Block Wall	R	Biege	F	0	0	13.9	114	0.11	0	0.7
12/22/2014	41	1	Basement	K - 30	I	Cement Floor	S	Gray	F	0	88	0	21	0	0	0
12/22/2014	42	1	Basement	D - 27	I	Brick Wall	R	Biege	F	0	0	0	96	0	0	0
12/22/2014	43	1	Basement	N - 29	I	Cement Block Wall	R	Biege	F	0	0	0	403	0	0	0
12/22/2014	44	1	Basement	M - 29	I	Cement Block Wall	R	Biege	F	0	0	0	382	0	0	0
12/22/2014	45	1	Basement	M - 29	I	Cement Floor	S	Gray	F	0	91	0	18	0	0	0
12/22/2014	46	1	Basement	M - 27	I	Cement Floor	S	Maroon	F	0	12.3	16	92	0	0	0
12/22/2014	47	1	Basement	K - 27	I	Cement Floor	S	Biege	F	0	0	0	82	0	0	0
12/22/2014	48	1	Basement	H - 27	I	Cement Floor	S	Biege	F	0	0	0	415	0	0	0
12/22/2014	49	1	Basement	D - 29	I	Cement Block Wall	R	Tan	F	0	0	0	0	0	0	0
12/22/2014	50	1	Basement	D - 28	I	Cement Floor	S	Red	F	0	1903	173	7025.3	3.9	21	2.6
12/22/2014	51	1	Basement	C - 29	I	Cement Block Wall	R	Tan	F	0	0	0	0	0	0	0
12/22/2014	52	1	Basement	A - 29	I	S? Cement Block Wall	R	Tan	F	0	0	0	404	0.11	0	0
12/22/2014	53	1	Basement	B - 27	I	S? Cement Block Wall	R	Tan	F	0	0	0	971	0	0	0
12/22/2014	54	1	Basement	B - 27	I	Cement Block Wall	R	Tan	F	0	0	11.7	0	0	0	0
12/22/2014	55	1	Basement	B - 27	I	S? Cement Block Wall	R	Black	F	0	0	0	0	0	0	0
12/22/2014	56	1	Basement	K - 28	I	Cement Block Wall	R	Tan	F	0	0	0	0	0.74	0	0
12/22/2014	57	1	Basement	Bottom	I	Cement Block Wall	R	Biege	F	0	0	0	0	0	0	0
12/22/2014	58	1	Basement	TOP	I	Cement Block Wall	R	Tan	F	0	0	0	0	0	0	0
12/22/2014	59	1	Basement	N - 29	I	Cement Floor	R	Dark Gray	F	0	911	0	430	0	0	0
12/22/2014	60	1	Basement	O - 29	I	S? Cment Block Wall	R	Dark Gray	F	0	67	0	443	4.7	0.09	0.67
12/22/2014	61	1	Basement	N - 28	I	S? Cment Block Wall	R	Tan	F	0	0	0	0	0	0	0
12/22/2014	62	1	Basement	P - 30	I	S? Cment Block Wall	R	Tan	F	0	0	0	0	0	0	0
12/22/2014	63	1	Basement	O - 30	I	S? Cment Block Wall	R	Tan	F	0	0	0	0	0	0	0
12/22/2014	65	1	Basement	P - 25	I	Cement Block Wall	R	Tan	F	0	0	0	0	0	0	0
12/22/2014	66	1	Basement	O - 26	I	S? Cment Block Wall	R	White	F	0	1106	0	488	0	0	0
12/22/2014	67	1	Basement	N - 31	I	Cement Block Wall	R	Tan	F	0	0	0	0	0	0	0
12/22/2014	68	1	Basement	M - 31	I	S? Cment Block Wall	R	White	F	0	1384	0	220	0	0	0
12/22/2014	69	1	Basement	J - 31	I	S? Cment Block Wall	R	White	F	0	1790	0	299	0	0	0
12/22/2014	70	1	Basement	L - 30	I	S? Cment Block Wall	R	White	F	0	1106	0	305	0	0	0.4
12/22/2014	71	1	Basement	J - 31	I	Cement Block Wall	R	White	F	0	1326	0	343	0	0	0
12/22/2014	72	1	Basement	J - 31	I	Cement Block Wall	R	Green	F	0	0	67	1180	0.04	0	0
12/22/2014	73	1	Basement	J - 30	I	Cement Block Wall	R	White	F	0	1104	0	391	0	0	0
12/22/2014	74	1	Basement	H - 31	I	Cement Block Wall	R	White	F	0	993	0	152	0	0	0

Date	Test #	Building #	Section & Floor	Location	Int (I) Ext (E)	Substrate	Rough (R) Smooth (S)	Color	Type Gloss (G) Flat (F)	As (ppm)	Ba (ppm)	Cd (ppm)	Cr (ppm)	Hg (ppm)	Se (ppm)	Ag (ppm)
12/22/2014	75	1	Basement	G - 31	I	Cement Block Wall	R	Green	F	0	0	0	0	0	0	0
12/22/2014	76	1	Basement	F - 31	I	Cement Block Wall	R	Beige	F	0	0	1.15	0	0	0	0
12/22/2014	77	1	Basement	F - 31	I	Cement Block Wall	R	Tan	F	0	0	0	0	0	0	0
12/22/2014	78	1	Basement	F - 30	I	Cement Block Wall	R	Off-White	F	0	46	0	0	0	0	0
12/22/2014	79	1	Basement	D - 31	I	Cement Block Wall	R	White	F	0	187	0	321	0	0	0
12/22/2014	80	1	Basement	D - 30	I	Cement Block Wall	R	Tan	F	0	0	0	0	0	0	0
12/22/2014	81	1	Basement	C - 30	I	Cement Block Wall	R	White	F	0	40	0	273	0	0	0
12/22/2014	82	1	Basement	B - 30	I	Cement Block Wall	R	White	F	0	39	1.63	73	0	0	0
12/22/2014	83	1	Basement	B - 30	I	Cement Block Wall	R	Yellow	F	0	560	0	0	0	0	0
12/22/2014	84	1	Basement	B - 30	I	Cement Floor	R	Gray	F	0	23	0	0	0	2	0
12/22/2014	85	1	Basement	A - 29	I	Cement Floor	R	Gray	F	0	19.4	0	0	0	2	0
12/22/2014	86	1	Basement	A - 29	I	Cement Hand rail	R	Tan	F	0	0	0	0	0	0	0
12/22/2014	87	1	Basement	B - 29	I	Cement Block Wall	R	Tan	F	0	1.1	13.8	0	0.79	0	0
12/22/2014	88	1	Basement	B - 29	I	Cement Block Wall	R	Tan	F	0	0	0	0	0	0	0
12/22/2014	89	1	Basement	C - 29	I	Cement Floor	R	Beige	F	0	0	0	0	0	0	0
12/22/2014	90	1	Basement	F - 30	I	Cement Floor	R	Gray	F	0	1.25	0	0	0	0	0
12/22/2014	91	1	Basement	F - 30	I	Cement Block Wall	R	Tan	F	0	0	0	0	0	0	0
12/22/2014	92	1	Basement	H - 29	I	Cement Pillar	R	Mint Green	F	0	240	0	0	0	0	0
12/22/2014	93,94	1	Basement	J - 29	I	Cement Block Wall	R	Tan	F	0	0	0	0	0	0	0
1/6/2015	12	1	Basement	Z - 29	I	Concrete Ceiling	S	Off-White	F	0	1.5	0	0	0	0	0
1/6/2015	13	1	Basement	S - 29	I	Concrete Ceiling	S	Off-White	F	0	3.7	0	0	0	0	0
1/6/2015	14	1	Basement	Q - 29	I	Concrete Ceiling	S	Off-White	F	0	6.6	0	0	0	0	0
1/6/2015	15	1	Basement	R - 29	I	Concrete Ceiling	S	Off-White	F	0	9.1	0	0	0	0	0
1/6/2015	16	1	Basement	R - 30	I	Concrete Ceiling Column	S	Off-White	F	0	4.1	0	0	0	0	0
1/6/2015	17	1	Basement	Q - 31	I	Concrete Ceiling	S	White	F	0	16	0	59	0	0	0
1/6/2015	19	1	Basement	S - 30	I	Concrete Ceiling	S	White	F	0	11.6	0	144	0.11	0	0
1/6/2015	20	1	Basement	R - 29	I	Concrete Ceiling	S	White	F	0	30	0	494	0	0	0
1/6/2015	21	1	Basement	Q - 31	I	Concrete Ceiling	S	Off-White	F	0	67	0	0	0	0	0
1/6/2015	23	1	Basement	U - 30	I	Concrete Ceiling	S	Off-White	F	0	92	0	0	0	0	0
1/6/2015	24	1	Basement	R - 28	I	Concrete Ceiling	S	Off-White	F	0	88	0	0	0	0	0
1/6/2015	25	1	Basement	Q- 29	I	Concrete Ceiling	S	Off-White	F	0	81	0	0	0	0	0
1/6/2015	33	1	Basement	R - 30	I	Concrete Ceiling	S	Tan	F	0	0	0	0	0	0	0
1/6/2015	34	1	Basement	R - 28	I	Concrete Ceiling	S	Off-White	F	0	13	0	0	0	0	0
1/6/2015	35	1	Basement	Q - 29	I	Concrete Ceiling	S	White	F	0	1.4	54.8	392	0	0	0
1/6/2015	36	1	Basement	Q - 28	I	Concrete Ceiling	S	White	F	0	3.7	70	172	0	0	0
1/6/2015	37	1	Basement	R - 28	I	Concrete Ceiling	S	White	F	0	18.1	88	127	0	0	0
1/6/2015	38	1	Basement	R - 29	I	Concrete Ceiling	S	Off-White	F	0.09	38	104	0	0	0	0
1/6/2015	39	1	Basement	R - 30	I	Concrete Ceiling	S	White	F	0	17	38	60	0	0	0
1/6/2015	40	1	Basement	S - 31	I	Concrete Ceiling	S	Tan	F	0	3.1	0	0	2.7	0	0
1/6/2015	41	1	Basement	S - 32	I	Concrete Ceiling	S	White	F	0	5.7	60	89	0	0	0

Date	Test #	Building #	Section & Floor	Location	Int (I) Ext (E)	Substrate	Rough (R) Smooth (S)	Color	Type Gloss (G) Flat (F)	As (ppm)	Ba (ppm)	Cd (ppm)	Cr (ppm)	Hg (ppm)	Se (ppm)	Ag (ppm)
1/6/2015	42	1	Basement	Q - 32	I	Concrete Ceiling	S	White	F	0	6.1	64	241	0	0	0
1/6/2015	43	1	Basement	Q - 31	I	Concrete Ceiling Column	S	Black	F	0	1.2	11.7	0	0	0	0
1/6/2015	44	1	Basement	R - 31	I	Concrete Ceiling	S	White	F	0	11.4	101	272	3.9	0	0.38
1/6/2015	45	1	Basement	X - 31	I	Concrete Ceiling	S	White	F	0	15.8	117	80	0	0	0
1/6/2015	46	1	Basement	AA - 31	I	Concrete Ceiling	S	Off-White	F	0	93	0	90	0	0	0
1/6/2015	47	1	Basement	AA - 28	I	Concrete Ceiling	S	Off-White	F	0	118	0	50	0	0	0
1/6/2015	49	1	Basement	Y - 29	I	Concrete Ceiling	S	Off-White	F	0	67	0	333	0	0	0
1/6/2015	50	1	Basement	Y - 28	I	Concrete Ceiling	S	Off-White	F	0	88	0	25	0	0	0
1/6/2015	51	1	Basement	X - 29	I	Concrete Ceiling	S	Tan	F	0	0	0	516	0	0	0
1/6/2015	52	1	Basement	W - 29	I	Concrete Ceiling	S	Off-White	F	0	207	8.9	2108	8.25	0	0
1/6/2015	53	1	Basement	V - 28	I	Concrete Ceiling	S	White	F	0	41	1.46	480	6.77	0	0.22
1/12/2015	87	1	Section 1	Z 1/2 - 45 1/2	I	Cpncrete Ceiling	S	White	F	0	20.2	2.8	548	3.8	0	0
1/12/2015	88	1	Section 1	Z 1/2 - 49 3/4	I	Cpncrete Ceiling	S	White	F	0	66	1.1	200	3.9	0	0
1/12/2015	89	1	Section 1	X - 49	I	Cpncrete Ceiling	S	White	F	1.3	37	7	241	9.1	0	0
1/12/2015	90	1	Section 1	W - 49	I	Cpncrete Ceiling	S	White	F	0	40	14.7	40	2.11	0.08	0
1/12/2015	91	1	Section 1	T 3/4 - 49 1/2	I	Cpncrete Ceiling	S	White	F	0	8	9	997	6	0	0
1/12/2015	92	1	Section 1	Z 1/2 - 51	I	Cement Block Wall	R	Tan	F	0	0	0	617	0	0	0
1/12/2015	93	1	Section 1	AA - 47	I	Concrete Wall	S	Tan	F	0	0	11.4	0	0	0	0
1/12/2015	94	1	Section 1	AA - 48	I	Cement Block Wall	R	Tan	F	0	0	0	0	0	0	0
1/12/2015	95	1	Section 1	Z 1/2 - 51	I	Cement Block Wall	R	Tan	F	0	0	0	0	0	0	0
1/12/2015	96	1	Section 1	Y - 50	I	Cement Block Wall	R	Tan	F	0	1.2	0	0	0	0	0
1/12/2015	97	1	Section 1	X - 49	I	Cement Block Wall	R	Tan	F	0	2.8	0	0	0	0	0
1/12/2015	98	1	Section 1	Z - 50	I	Cement Floor	S	Light Blue	F	0	168	0	0	0	0	0
1/12/2015	99	1	Section 1	Z-49	I	Cement Floor	S	Brown	F	0	0	0	0	0	0	0
1/12/2015	100	1	Section 1	Z 1/2 - 46 1/2	I	Cement Floor	S	Light Blue	F	0	210	0	0	0	0	0
1/12/2015	101	1	Section 1	X - 47 1/2	I	Cement Block Wall	R	Tan	F	0	0	6.8	0	0.11	0	0
1/12/2015	102	1	Section 1	X - 47	I	Cement Block Wall	R	Tan	F	0	0	0	0	0	0	0
1/12/2015	103	1	Section 1	W 1/2 - 46 1/2	I	Cement Floor	S	Blue	F	0	9.4	0	0	0	0	0
1/12/2015	104	1	Section 1	X 1/2 - 47	I	Cement Floor	S	Blue	F	0	5.1	0	0	0	0	0
1/12/2015	105	1	Section 1	X 1/2 - 46	I	Cement Floor	S	Blue	F	0	16	1.1	0	0	0	0
1/12/2015	106	1	Section 1	X - 46	I	Cement Block Wall	R	Tan	F	0	0	3.1	0	0	0	0
1/12/2015	107	1	Section 1	X - 45 1/2	I	Cement Block Wall	R	Tan	F	0	0	0	0	0	0	0
1/12/2015	108	1	Section 1	X 1/2 - 45 1/2	I	Cement Bfloor	S	Light Blue	F	0	980	47	406	0	0	0
1/12/2015	109	1	Section 1	W - 45	I	Cement Block Wall	R	Tan	F	0	0	0	0	0	0	0
1/12/2015	110	1	Section 1	T 1/2 - 45	I	Cement Block Wall	R	Tan	F	0	0	0	0	0	0	0
1/12/2015	111	1	Section 1	T - 46	I	Cement Block Wall	R	Tan	F	0	2.3	0	0	0.07	0.77	0
1/12/2015	112	1	Section 1	T - 47 1/2	I	Cement Block Wall	R	Tan	F	0	0.58	0	0	0	0	0
1/12/2015	113	1	Section 1	U 47 1/2	I	Cement Floor	S	Blue	F	0	0	0	0	0	0	0
1/12/2015	114	1	Section 1	U - 46 1/2	I	Cement Floor	S	Light Blue	F	6	1014	68	173	0	0	0
1/12/2015	115	1	Section 1	U - 3/4 - 46	I	Cement Floor	S	Light Blue	F	0	923	91	107	0	0	0

Date	Test #	Building #	Section & Floor	Location	Int (I) Ext (E)	Substrate	Rough (R) Smooth (S)	Color	Type Gloss (G) Flat (F)	As (ppm)	Ba (ppm)	Cd (ppm)	Cr (ppm)	Hg (ppm)	Se (ppm)	Ag (ppm)
1/12/2015	116	1	Section 1	W 1/2 - 50	I	Cement Block Wall	R	Black	F	0	0	0	0	0	0	0
1/12/2015	117	1	Section 1	W - 49	I	Cement Floor	S	Blue	F	0	0	0	0	0	0	0
1/12/2015	118	1	Section 1	V - 50	I	Cement Block Wall	R	Tan	F	0	0	0	0	0	0	0
1/12/2015	119	1	Section 1	T - 49 1/2	I	Cement Block Wall	R	Tan	F	0	0	0	0	0	0	0
1/12/2015	120	1	Section 1	T - 49	I	Cement Floor	S	Blue	F	0	0	0	0	0	0	0
1/12/2015	121	1	Section 1	V - 50	I	Cement Block Wall	R	Tan	F	0	0	0	0	0	0	0
1/12/2015	122	1	Section 1	V - 50 1/2	I	Cement Floor	S	Red	F	0	6780	147	6960.5	67.4	4.4	60
1/12/2015	123	1	Section 1	V 1/2 - 51	I	Cement Block Wall	R	Tan	F	0	0	0	0	0	0	0
1/13/2015	17	1	Section 1	S 50 1/2	I	Cement Floor	S	Dark Grey	F	0	23	0	267	0	0	0
1/13/2015	18	1	Section 1	R 1/2 - 51	I	Cement Block Wall	R	Tan	F	0	0	0	0	0	0	0
1/13/2015	19	1	Section 1	Q 1/2 - 50 1/2	I	Cement Floor	S	Light Grey	F	0	617	6.1	218	0	0	0
1/13/2015	20	1	Section 1	Q 1/2 - 50	I	Cement Block Wall	R	Tan	F	0	0	0	0	0	0	0
1/13/2015	21	1	Section 1	P - 50 1/2	I	Cement Floor	S	Grey	F	0	201	0	0	0	0	0
1/13/2015	22	1	Section 1	L 1/3 - 50 1/2	I	Cement Floor	S	Light Grey	F	0	804	3.3	428	0	0	0
1/13/2015	23	1	Section 1	J 1/2 - 50	I	Cement Block Wall	R	Tan	F	0	0	0	0	0	0.34	0
1/13/2015	24	1	Section 1	J 1/2 - 51	I	Cement Block Wall	R	Tan	F	0	67	0	0	0	0	0
1/13/2015	25	1	Section 1	F - 50 1/2	I	Cement Floor	S	Grey	F	2	204	0	26	0	0	0
1/13/2015	26	1	Section 1	F - 50 1/2	I	Cement Floor	S	Grey	F	0	270	0	382	0	0	0
1/13/2015	27	1	Section 1	E 1/2 - 51	I	Cement Block Wall	R	Tan	F	0	0	0	0	0	0	0
1/13/2015	28	1	Section 1	E - 51	I	Concrete Wall	S	Tan	F	0	0	0	0	0	0	0
1/13/2015	29	1	Section 1	G - 49	I	Cement Floor	S	Grey	F	0	0	0	455	0	0	0
1/13/2015	30	1	Section 1	G 1/2 - 48 1/2	I	Cement Block Wall	R	Tan	F	0	0	0	0	0	0	0
1/13/2015	31	1	Section 1	J - 49 1/2	I	Cement Floor	S	Grey	F	0	0	0	173	2.2	0	0.11
1/13/2015	32	1	Section 1	K - 50	I	Cement Block Wall	R	Tan	F	0	0	0	0	0	0	0
1/13/2015	33	1	Section 1	L 3/4 - 50	I	Cement Block Wall	R	Tan	F	0	0	0	0	0	0	0
1/13/2015	34	1	Section 1	M 1/2 - 49 1/2	I	Cement Floor	S	Grey	F	0	0	2.1	56	0	0	0
1/13/2015	35	1	Section 1	M 1/2 - 50	I	Cement Block Wall	R	Tan	F	0	0	0	0	0	0	0
1/13/2015	36	1	Section 1	N 3/4 - 50	I	Cement Block Wall	R	Beige	F	0	0	0	0	0	0	0
1/13/2015	37	1	Section 1	N 1/2 - 49	I	Cement Floor	S	Light Grey	F	0	594	1.14	44	0	0	0
1/13/2015	38	1	Section 1	O 1/2 - 49 1/2	I	Cement Floor	S	Beige	F	0	0	0	0	0	0	0
1/13/2015	39	1	Section 1	P - 48 1/2	I	Cement Floor	S	Grey	F	0	32	0	452	0	0	0
1/13/2015	40	1	Section 1	O 1/2 - 50	I	Cement Floor	S	Grey	F	0	67	0	104	0	0	0
1/13/2015	41	1	Section 1	P 1/2 - 49 3/4	I	Cement Block Wall	R	Tan	F	0	0	0	0	0	0.9	0
1/13/2015	42	1	Section 1	O 1/2 - 48 3/4	I	Cement Block Wall	R	Tan	F	0	4.7	0	0	0	0	0
1/13/2015	43	1	Section 1	O 1/2 -50	I	Cement Block Wall	R	Tan	F	1	61	4.3	0	9.3	0	0.04
1/13/2015	44	1	Section 1	Q 3/4 - 49	I	Cement Floor	S	Grey	F	0	16.7	2.2	213	0	0	0
1/13/2015	45	1	Section 1	O 3/4 - 49	I	Cement Block Wall	R	Tan	F	0	0	0	0	0	0	0
1/13/2015	46	1	Section 1	R 1/2 - 50	I	Cement Block Wall	R	Tan	F	0	0	0	0	0	0	0
1/13/2015	47	1	Section 1	S 48 3/4	I	Cement Floor	S	Dark Grey	F	0	40	6	166	0	0	0
1/13/2015	48	1	Section 1	R 1/2 - 50	I	Cement Block Wall	R	Tan	F	0	0	0	0	0	0	0

Date	Test #	Building #	Section & Floor	Location	Int (I) Ext (E)	Substrate	Rough (R) Smooth (S)	Color	Type Gloss (G) Flat (F)	As (ppm)	Ba (ppm)	Cd (ppm)	Cr (ppm)	Hg (ppm)	Se (ppm)	Ag (ppm)
1/13/2015	49	1	Section 1	R 1/2 - 50	I	Cement Floor	S	Grey	F	0	17	3.8	269	0	0	0
1/13/2015	50	1	Section 1	N 1/2 - 46 1/2	I	Cement Floor	S	Maroon	F	0	86	17	1638	4.8	0	0.9
1/13/2015	51	1	Section 1	N - 47 1/2	I	Cement Block Wall	R	Tan	F	0	0	0	0	0	0	0
1/13/2015	52	1	Section 1	Q 1/4 - 47 1/2	I	Cement Floor	S	Blue	F	0	237	0	0	0	0	0
1/13/2015	53	1	Section 1	Q 1/2 - 47 1/2	I	Cement Floor	S	Grey	F	0	345	0	258	0	0	0
1/13/2015	54	1	Section 1	M - 46	I	Cement Block Wall	R	Off-White	F	0	180	0	48	0	0	0
1/13/2015	55	1	Section 1	K - 47	I	Cement Block Wall	R	Off-White	F	0	211	0	92	0	0	0
1/13/2015	56	1	Section 1	L - 46	I	Cement Floor	S	Grey	F	0	638	0	20	16.7	2.2	2.7
1/13/2015	57	1	Section 1	E - 47	I	Cement Floor	S	Light Grey	F	0	465	0	37	0	0	0
1/13/2015	58	1	Section 1	D 1/2 - 45 1/2	I	Cement Floor	S	Dark Grey	F	0	31	0	1.2	0	0	0
1/13/2015	59	1	Section 1	E 1/2 - 45 3/4	I	Cement Floor	S	Blue	F	0	91	0	33	0	0	0
1/13/2015	60	1	Section 1	E - 45	I	Cement Floor	S	Blue	F	0	106	0	47	0	0	0
1/13/2015	61	1	Section 1	F - 44 1/2	I	Cement Floor	S	Light Grey	F	0	560	0	92	0	0	0
1/13/2015	62	1	Section 1	D 1/2 - 45 1/2	I	Craised Floor	S	Off-White	F	0	984	0	16	0	0	0
1/13/2015	63	1	Section 1	D 1/2 - 51	I	Cement Wall	S	Salmon	F	0	0	0	61.9	0	0	0
1/13/2015	64	1	Section 1	D 1/2 - 51	I	Cement Wall	S	White	F	0	0	0	48.2	0	0	0
1/13/2015	65	1	Section 1	D 1/2 - 50 1/2	I	Cement Floor	S	Light Grey	F	0	0	1.12	20.3	0	0	0
1/13/2015	66	1	Section 1	D 1/2 - 50 1/2	I	Cement Block Wall	R	Salmon	F	0	0	0	39.1	0	0	0
1/13/2015	67	1	Section 1	D 1/2 - 50 1/2	I	Cement Block Wall	R	White	F	0	3.7	0	14.7	0	0	0
1/13/2015	68	1	Section 1	D 1/2 - 50 1/4	I	Cement Wall	S	Tan	F	0	0	0	0	0	0	0
1/13/2015	69	1	Section 1	F 1/4 - 49 1/2	I	Cement Wall	S	Tan	F	0	0	0	0	0	0	0
1/13/2015	70	1	Section 1	D - 49 1/2	I	Cement Block Wall	R	Tan	F	0	0	0	30.1	0	0	0
1/13/2015	71	1	Section 1	E 1/2 - 49 1/2	I	Longbrick Wall	R	Tan	F	0	0	0	48.6	0	0	0
1/13/2015	72	1	Section 1	F - 49 1/2	I	Cement Block Wall	R	Tan	F	0	0	0	19.8	0	0	0
1/13/2015	73	1	Section 1	F - 50	I	Cement Block Wall	R	Tan	F	0	0	0	30	0	0	0
1/13/2015	74	1	Section 1	E 48 1/2	I	Cement Block Wall	R	Beige	F	0	0	0	47	0	0	0
1/13/2015	75	1	Section 1	B 1/2 - 46 1/2	I	Brick Wall	R	White	F	0	3.4	0	0	0	0	0
1/13/2015	76	1	Section 1	C 1/2 - 45	I	Cement Block Wall	R	Mint Green	F	0	740	18	892.7	0	0.11	8.1
1/13/2015	77	1	Section 1	C 1/2 - 45 1/2	I	Cement Block Wall	R	Mint Green	F	0	818	37	1138.1	0	0.42	6
1/13/2015	78	1	Section 1	C 1/2 - 45	I	Cement Block Wall	R	White	F	0	0	0	109	0	0	0
1/13/2015	79	1	Section 1	C 1/4 - 49 3/4	I	Cement Floor	S	Maroon	F	0	0	13	0	0	0	0
1/13/2015	80	1	Section 1	C 1/2 - 49 1/2	I	Cement Block Wall	R	Tan	F	0	0	0	412	0.94	0	0
1/13/2015	81	1	Section 1	C 1/2 - 49 1/2	I	Cement Block Wall	R	Beige	F	0	0	0	493	0	0	0
1/13/2015	82	1	Section 1	B 1/2 - 49	I	Cement Block Wall	R	Off-White	F	0	17.4	0	73	0	0	0
1/13/2015	83	1	Section 1	B 1/2 - 49	I	Cement Block Wall	R	Beige	F	0	0	0	0	0	0	0
1/13/2015	84	1	Section 1	J 1/2 - 48	I	Cement Block Wall	R	White	F	0	0	0	404	0	0	0
1/13/2015	85	1	Section 1	G - 44 1/2	I	Cement Block Wall	R	White	F	0	0	0	264	0.11	0	0
1/13/2015	86	1	Section 1	H -46	I	Cement Floor	S	Light Grey	F	0	0	0	398	0	0	0
1/13/2015	87	1	Section 1	C - 50	I	Cement Wall Border	S	White	F	0	0	0	217	0	0	0
1/13/2015	88	1	Section 1	C - 50 1/2	I	Cement Floor	S	Grey	F	0	0	0	427	0	0	0

Date	Test #	Building #	Section & Floor	Location	Int (I) Ext (E)	Substrate	Rough (R) Smooth (S)	Color	Type Gloss (G) Flat (F)	As (ppm)	Ba (ppm)	Cd (ppm)	Cr (ppm)	Hg (ppm)	Se (ppm)	Ag (ppm)
1/13/2015	89	1	Section 1	A 1/2 - 50 1/2	I	Cement Floor	S	Blue	F	0	0	0	354	0	0	0
1/13/2015	90	1	Section 1	A - 50 1/2	I	Cement Wall Border	S	White	F	0	6.7	32.7	400.8	0.6	0	0
1/13/2015	91	1	Section 1	A 1/2- 49 1/2	I	Cement Block Wall	R	White	F	0	340	10	216.3	0	0	0
1/16/2015	95	1	Section 2	Z - 38	I	Cement Block Wall	R	Tan	F	0.08	2.4	98.1	801	3.1	0	0
1/16/2015	96	1	Section 2	Z - 36 1/2	I	Cement Floor	S	Blue	F	0	88	207	2387	27.1	0	0
1/16/2015	97	1	Section 2	Z - 36	I	Cement Floor	S	Light Grey	F	0.3	380	180	1804	18	0	0.04
1/16/2015	98	1	Section 2	X 1/2 - 35	I	Cement Block Wall	R	Tan	F	0	4817	36	223	19.3	0	0
1/16/2015	99	1	Section 2	U 1/2 - 38	I	Cement Wall	S	Light Grey	F	0	349	3.7	461	47.8	0.48	0
1/16/2015	100	1	Section 2	U 35 1/2	I	Flooring	S	Grey	F	0	66	199	83	92.7	0	0
1/16/2015	101	1	Section 2	X 1/2 - 37	I	Cement Slab	S	Beige	F	0	3.3	245	4.9	80	0.7	0
1/16/2015	102	1	Section 2	W - 38	I	Cement Block Wall	R	Tan	F	0	5501	12.9	416.5	44.1	44.9	0
1/16/2015	103	1	Section 2	W - 37	I	Cement Floor (Upstairs)\	S	Beige	F	0.7	14.8	37	3.7	1.1	32.6	0
1/16/2015	104	1	Section 2	U 1/2 - 38	I	Cement Block Wall	R	Tan	F	0	0	10.2	501.8	16.2	87.2	0
1/16/2015	105	1	Section 2	T - 36 1/2	I	Flooring over Cement Floor	S	Light Grey	F	0	730	66	0	34.1	0.34	0
1/16/2015	106	1	Section 2	R 1/2 - 35	I	Flooring over Cement Floor	S	Light Grey	F	2.4	904	19.2	0	20	0.99	0
1/16/2015	107	1	Section 2	R - 35 1/2	I	Cement Block Wall	R	Tan	F	0	2.2	98	2760	47.9	22.7	0
1/16/2015	108	1	Section 2	S - 38	I	Cement Block Wall	R	Tan	F	3	0	49	3890.2	63	60.1	0
1/16/2015	109	1	Section 2	R - 36 1/4	I	Cement Block Wall	R	Tan	F	7	3.8	70	2943.7	94	49.3	0.8
1/16/2015	110	1	Section 2	Q 1/2 - 37 1/4	I	Cement Floor Raised	S	Blue	F	0	19	67	1867	0.23	16.8	0
1/16/2015	111	1	Section 2	P 1/2 - 37 1/2	I	Flooring	S	Light Grey	F	0	0	11	0	0	0	0
1/16/2015	112	1	Section 2	O - 38	I	Cement Block Wall	R	Tan	F	0	0	0	17	0	0	0
1/16/2015	113	1	Section 2	M 1/2 - 36 3/4	I	Cement Floor	S	Blue	F	0	0	3.8	101.3	0	0	0
1/16/2015	114	1	Section 2	M 1/2 - 36	I	Cement Block	S	Light Grey	F	0	0	0	89	0	0	0
1/16/2015	115	1	Section 2	M - 35 1/2	I	Cement Block Wall	R	Tan	F	0	44	19.1	14.8	0	0	0
1/16/2015	116	1	Section 2	M - 38	I	Cement Floor	S	Maroon	F	0	0	0	0	0	0.7	0
1/16/2015	117	1	Section 2	M - 38	I	Cement Block Wall	R	Beige	F	0	0	0	37.1	0	0	0
1/16/2015	118	1	Section 2	M - 38	I	Cement Block Wall	R	Tan	F	0	0	0	85	0	0	0
1/16/2015	119	1	Section 2	M - 39 1/4	I	Cement Block Wall	R	White	F	0	32	0	60.9	0	0	0
1/16/2015	120	1	Section 2	M - 42	I	Cement Block Wall	R	Tan	F	0	0	43	62	0	0	0
1/16/2015	121	1	Section 2	L - 43 1/2	I	Cement Block Wall	R	White	F	0	93	0	194.1	0	0	0
1/16/2015	122	1	Section 2	J 1/2 - 43 1/2	I	Cement Floor	S	Grey	F	0	12.2	0	109.3	0.83	0	0
1/16/2015	123	1	Section 2	J 1/2 - 44	I	Cement Block Wall	R	Tan	F	0	0	0	0	0	0	0
1/16/2015	124	1	Section 2	L 1/2 - 44	I	Cement Block Wall	R	Tan	F	0	3.8	0	0	0	0	0
1/16/2015	125	1	Section 2	L 1/2 - 43	I	Cement Floor	S	Blue	F	0	1.4	10.8	88.3	0	0	0
1/16/2015	126	1	Section 2	L 1/2 - 43 1/2	I	Cement Block Wall	R	Tan	F	0	0	0	0	0	0	0
1/16/2015	127	1	Section 2	L 1/2 - 42 1/2	I	Cement Block Wall	R	White	F	0	39	0	0	0	0	0
1/16/2015	128	1	Section 2	J 1/2 - 35	I	Cement Floor	S	Light Grey	F	0	0	0	1.3	0	0	0
1/16/2015	129	1	Section 2	J 1/2 - 35	I	Cement Floor	S	Grey	F	0	0	0	14.8	0	0	0
1/16/2015	130	1	Section 2	H 1/2 - 38	I	Cement Block Wall	R	Tan	F	0	0	0	0	0	0	0
1/16/2015	131	1	Section 2	G 3/4 - 38	I	Cement Block Wall	R	White	F	0	88	0	0	0	0	0

Date	Test #	Building #	Section & Floor	Location	Int (I) Ext (E)	Substrate	Rough (R) Smooth (S)	Color	Type Gloss (G) Flat (F)	As (ppm)	Ba (ppm)	Cd (ppm)	Cr (ppm)	Hg (ppm)	Se (ppm)	Ag (ppm)
1/16/2015	132	1	Section 2	H 1/2 - 37 1/2	I	Cement Floor	S	Light Grey	F	0	412	17.9	401.6	16.7	0	6.3
1/16/2015	133	1	Section 2	H 1/2 - 36	I	Flooring	S	Beige	F	0	0	11.1	807	0	0	0
1/16/2015	134	1	Section 2	F - 38	I	Cement Block Wall	R	Tan	F	0	0	0	0	0	0	0
1/16/2015	135	1	Section 2	E - 37	I	Cement Block Wall	R	Tan	F	0	0	0	0	0	0	0
1/16/2015	136	1	Section 2	F - 36 1/2	I	Cement Floor	S	Light Grey	F	0	630	47	1107.2	11.9	0	0
1/16/2015	137	1	Section 2	J 1/2 - 38	I	Cement Block Wall	R	White	F	0	55	0	0	0	0	0
1/16/2015	138	1	Section 2	D 1/2 - 36 1/2	I	Cement Floor	S	Light Grey	F	0	19	31	900.3	11.4	0	0
1/16/2015	139	1	Section 2	D 1/2 - 36 1/2	I	Cement Floor	S	Grey	F	0	0	39	2100.1	16.5	0	0.11
1/16/2015	140	1	Section 2	E - 36 1/2	I	Cement Block Wall	R	Tan	F	0	0	0	0	0	0	0
1/16/2015	141	1	Section 2	C 1/2 - 38	I	Cement Block Wall	R	Yellow	F	0	0	0	856	0	0	0
1/16/2015	142	1	Section 2	C - 35 1/2	I	Cement Block Wall	R	Tan	F	0	0	0	0	0	0	0
1/16/2015	143	1	Section 2	C - 35 1/2	I	Cement Wall Base	S	Tan	F	0	0	0	0	0	0	0
1/16/2015	144	1	Section 2	C - 35 1/4	I	Cement Floor	S	Tan	F	0	0	0	0	0	0	0
1/16/2015	145	1	Section 2	A 1/2 - 34 1/2	I	Cement Floor	S	Beige	F	0	0	0	0	0	0	0
1/16/2015	146	1	Section 2	C 1/2 34 1/2	I	Cement Floor	S	Light Grey	F	0	1.8	0	53	0	0	0
1/16/2015	147	1	Section 2	A - 38 1/2	I	Cement Column	S	Red	F	0	418	301	7462.5	61.1	0	0
1/16/2015	148	1	Section 2	A - 39 1/2	I	Cement Column	S	Yellow	F	0	0	91	900	0	0	0
1/16/2015	149	1	Section 2	A - 39	I	Cement Block Wall	R	Tan	F	0	0	0	0	0	0	0
1/16/2015	150	1	Section 2	B - 38	I	Cement Block Wall	R	Tan	F	0	0	0	0	0	0	0
1/16/2015	151	1	Section 2	F - 39 1/2	I	Cement Block Wall	R	Tan	F	0	0	0	0	0	0	0
1/16/2015	152	1	Section 2	E - 38	I	Cement Block Wall	R	White	F	0	3.7	1.4	483	0	0	0
1/16/2015	153	1	Section 2	E - 38	I	Cement Block Wall	R	Tan	F	0	0	0	0	0	0	0
1/16/2015	154	1	Section 2	D 1/2 - 38 1/2	I	Cement Block Wall	R	Tan	F	0	0	0	0	0	0	0
1/16/2015	155	1	Section 2	G 1/2 - 38	I	Cement Block Wall	R	Tan	F	0	0	0	0	0	0	0
1/16/2015	156	1	Section 2	G 1/2 - 38 1/2	I	Cement Block Wall	R	White	F	0	840	2.2	148	0	0	0
1/16/2015	157	1	Section 2	G - 44	I	Cement Block Wall	R	Tan	F	0	0	0	0	0	0	0
1/16/2015	158	1	Section 2	F - 43	I	Cement Block Wall	R	Tan	F	0	333	0	0	0	0	0
1/16/2015	159	1	Section 2	E 1/2 - 42	I	Cement Floor	S	Blue	F	0	0	0	0	0	0	0
1/16/2015	160	1	Section 2	F - 42	I	Cement Column	S	Yellow	F	0	5.1	16.3	82	0	0	0
1/16/2015	161	1	Section 2	F - 41	I	Cement Block Wall	R	Tan	F	0	0	0	0	0	0	0
1/16/2015	162	1	Section 2	C 1/2 - 43 1/2	I	Cement Block Wall	R	Tan	F	0	0	0	0	0	0	0
1/16/2015	163	1	Section 2	A - 41 1/2	I	Cement Column	S	Teal	F	0	90	43	0	3.3	0.84	0.23
1/16/2015	164	1	Section 2	A - 42	I	Cement Block Wall	R	Tan	F	0	0	0	0	0	0	0
1/17/2015	14	1	Section 2	Z - 40 Column	I	Concrete	S	Tan	F	0	0	0	0	0	0	0
1/17/2015	15	1	Section 2	Z - 40 Upper Column	I	Concrete	S	White	F	0	45	2.1	80	0	0	0
1/17/2015	16	1	Section 2	Z - 40 Lower Column	I	Concrete	S	Tan	F	0	0	0	0	0	0	0
1/17/2015	17	1	Section 2	Z - 40 Wall	I	Concrete Block	R	Tan	F	0	3.3	0	0	0	0	0
1/17/2015	18	1		VOID	I E		R S		G F	0	0	0	0	0	0	0
1/17/2015	19	1	Section 2	Y - 41 1/2 Ceiling	I	Concrete	S	White	F	0	0	0	194	0	0	0
1/17/2015	20	1	Section 2	Z - 44 Ceiling	I	Concrete	S	Light Tan	F	0	0	0	0	0	0	0

Date	Test #	Building #	Section & Floor	Location	Int (I) Ext (E)	Substrate	Rough (R) Smooth (S)	Color	Type Gloss (G) Flat (F)	As (ppm)	Ba (ppm)	Cd (ppm)	Cr (ppm)	Hg (ppm)	Se (ppm)	Ag (ppm)
1/17/2015	21	1	Section 2	Z - 44 Column	I	Concrete	S	Beige	F	0	0	0	0	0	0	0
1/17/2015	22	1	Section 2	X - 41 Column	I	Concrete	S	Red	F	0	1940	315	6055.2	33.7	0	13.8
1/17/2015	23	1	Section 2	V - 42 Wall	I	Cement Block	S	White	F	0	61	21	418	0.66	0	0
1/17/2015	24	1	Section 2	W - 43 Column	I	Concrete	S	Beige	F	0	0	0	0	0	0	0
1/17/2015	25	1	Section 2	W - 44 Wall	I	Concrete	S	Yellow	F	0.09	618	40	212	0.12	0	0
1/17/2015	26	1	Section 2	X - 43 Column	I	Concrete	S	Beige	G	0	0	0	0	0	0.6	0
1/17/2015	27	1	Section 2	V - 43 Wall	I	Cement Block	S	Blue Grey	F	0	110	0	0	0	0	0
1/17/2015	28	1	Section 2	V - 42 Column	I	Concrete	S	Blue	F	0	0	0	0	0	0	0
1/17/2015	29	1	Section 2	V - 42 Upper Column	I	Concrete	S	White	F	0	30	2.8	302	3.17	0	0
1/17/2015	30	1	Section 2	S - 43 1/2 Column	I	Concrete	S	Light Grey	G	0	619	0	0	0	0	0
1/17/2015	31	1	Section 2	S - 43 Column	I	Concrete	S	Light Blue	G	0	540	0	0	0	0	0
1/17/2015	32	1	Section 2	R - 41 Ceiling	I	Concrete	S	Beige	F	0	0	0	0	0	0	0
1/17/2015	33	1	Section 2	R - 41 Ceiling	I	Concrete	R S	Beige	G F	0	0	0	0	0	0	0
1/17/2015	34	1	Section 2	R - 41 Ceiling	I	Concrete	S	Tan	F	0	0	0	0	0	0	0
1/17/2015	35	1	Section 2	R - 39 Column	I	Concrete	S	Red	G	0	6832	276	9237	38.1	0	16
1/17/2015	36	1	Section 2	O - 39 Column	I	Concrete	S	Light Blue	G	0	445	4.3	393	0	0	0
1/17/2015	37	1	Section 2	N - 37 Roof Deck	I	Concrete	S	White	F	0	34	16.7	44	0.44	2.7	0
1/17/2015	38	1	Section 2	N - 37 Ceiling	I	Concrete	S	White	F	0	18.1	0	184	0	2.8	0
1/17/2015	39	1	Section 2	N - 35 Column	I	Concrete	S	White	F	0	27	5.5	204	0	3.1	0
1/17/2015	40	1	Section 2	N - 35 Column	I	Concrete	S	Tan	F	0	16.3	0	0	0	0	0
1/17/2015	41	1	Section 2	P - 36 Roof Deck	I	Concrete	S	White	F	0	0	0	273	6.1	0	0
1/17/2015	42	1	Section 2	P - 36 Roof Deck	I	Concrete	S	White	F	0	1.4	2.9	128	0	0	0
1/17/2015	43	1	Section 2	R - 35 Ceiling	I	Concrete	S	White	F	0	9	4.7	251	0	0	0
1/17/2015	44	1	Section 2	S - 36 Ceiling	I	Concrete	S	White	F	0	0	8.1	374	0	0	0
1/17/2015	45	1	Section 2	K - 35 Ceiling	I	Concrete	S	White	F	0	27	0	311	0	0	0
1/17/2015	46	1	Section 2	E - 36 Ceiling	I	Concrete	S	White	F	0	3.9	0	495	0	0	0
1/17/2015	47	1	Section 2	F - 36 Ceiling	I	Concrete	S	Tan	F	0	0	0	0	0	0	0
1/17/2015	48	1	Section 2	F - 37 Ceiling	I	Concrete	S	White	F	0	0	0	0	0	0	0
1/17/2015	49	1	Section 2	D- 35 Ceiling	I	Concrete	S	White	F	0.6	8	0	485	0	0	0
1/17/2015	50	1	Section 2	E - 36 Ceiling	I	Concrete	S	White	F	0	19.1	3.3	3	0.9	0	0
1/17/2015	51	1	Section 2	E - 36 Wall	I	Cement Block	S	Tan	F	0	0	0	0	0	0	0
1/17/2015	52	1	Section 2	E - 36 Wall	I	Cement Block	S	Tan	F	0	0	0	0	0	0	0
1/17/2015	53	1	Section 2	R - 40 Column	I	Concrete	S	Yellow	G	0	88	4.7	0	0	0	0
1/17/2015	54	1	Section 2	D - 41 Base	I	Concrete	S	Tan	F	0	0	0	0	0	0	0
1/17/2015	55	1	Section 2	D - 41 Upper Column	I	Concrete	S	Red	G	0.58	4201	239	7006.2	19.1	0	17
1/17/2015	56	1	Section 2	D - 41 Lower Column	I	Concrete	S	Red	G	0	3694	402	6461.9	40.2	0	20.5
1/17/2015	57	1	Section 2	F - 41 Column	I	Concrete	S	Light Grey	F	0	18.4	2.7	0	0	14	0
1/17/2015	70	1	Section 2	Z - 35 Ceiling	I	Concrete	S	Light Tan	F	0.1	847	101	806.6	13.3	60.8	0.37
1/17/2015	71	1	Section 2	Z - 35 Wall	I	Concrete Block	S	Light Tan	F	6.1	280	140	97.7	8.9	80	0
1/17/2015	72	1	Section 2	Z - 35 Ceiling	I	Concrete	S	White	F	0	2290	193	49.8	2.3	44.7	0

Date	Test #	Building #	Section & Floor	Location	Int (I) Ext (E)	Substrate	Rough (R) Smooth (S)	Color	Type Gloss (G) Flat (F)	As (ppm)	Ba (ppm)	Cd (ppm)	Cr (ppm)	Hg (ppm)	Se (ppm)	Ag (ppm)
1/17/2015	73	1	Section 2	U - 35 Ceiling	I	Concrete	S	White	F	66	1807	166	57.1	0.47	19.8	2
1/17/2015	74	1	Section 2	Z - 37 Column	I	Concrete	S	Tan	F	70.4	1100	87	101.3	32.9	46	13
1/19/2015	165	1	Section 3	V - 32 1/2	I	Cement Block Wall	R	White	F	0	0	13.1	237	0.11	19	6.1
1/19/2015	166	1	Section 3	X - 31	I	Cement Block Wall	R	White	F	0	13.2	2.5	28	0.37	28.1	0
1/19/2015	167	1	Section 3	Y 1/2 - 31	I	Cement Block Wall	R	Tan	F	0	47	0	0	0	0	0
1/19/2015	168	1	Section 3	Y 1/2 - 30	I	Cement Floor	S	Blue	F	0	0	0	0	0	0	0
1/19/2015	169	1	Section 3	W 1/2 - 31	I	Cement Block Wall	R	Tan	F	0	0	2.7	400	9.9	0	0.8
1/19/2015	170	1	Section 3	V 1/2 - 31	I	Cement Block Wall	R	Tan	F	0	0	0	0	0	0	0
1/19/2015	171	1	Section 3	V 1/2 - 30 1/2	I	Cement Floor	S	Blue	F	0	8.7	0	0	0	0	0
1/19/2015	172	1	Section 3	U 1/2 - 31 1/4	I	Cement Floor	S	Dark Green	F	0	0	13.2	0	0	0	0
1/19/2015	173	1	Section 3	V - 32	I	Cement Wall	S	Tan	F	0	0	0	0	0	0	0
1/19/2015	174	1	Section 3	V - 31 1/2	I	Cement Block Wall	R	Tan	F	0	0	0	0	0	0	0
1/19/2015	175	1	Section 3	V - 33 1/2	I	Cement Block Wall	R	Tan	F	0	0	80	1930	17	0	0.14
1/19/2015	176	1	Section 3	T 1/2 - 34	I	Cement Block Wall	R	Tan	F	0	0	0	0	0	0	0
1/19/2015	177	1	Section 3	S - 33 1/2	I	Cement Block Wall	R	Tan	F	0	0	0	0	0	0	0
1/19/2015	178	1	Section 3	S - 32 1/2	I	Cement Block Wall	R	Tan	F	0	0	0	0	0	0	0
1/19/2015	179	1	Section 3	S - 29 1/2	I	Cement Block Wall	R	Tan	F	0	0	0	0	0	0	0
1/19/2015	180	1	Section 3	S - 31	I	Cement Block Wall	R	Beige	F	0	0	2.7	801	0	0	0
1/19/2015	181	1	Section 3	R - 30 1/2	I	Cement Wall	S	Beige	F	0	0	9.4	64	0.88	0	0.17
1/19/2015	182	1	Section 3	R - 31 1/2	I	Cement Floor	S	Maroon	F	0	0	0	0	0	0	0
1/19/2015	183	1	Section 3	R - 32 1/2	I	Cement Floor	S	Light Grey	F	0	700	2.1	498	4.1	0	0
1/19/2015	184	1	Section 3	R - 32 1/2	I	Cement Block Wall	R	Tan	F	0	0	0	0	0	0	0
1/19/2015	185	1	Section 3	S - 33 1/2	I	Cement Block Wall	R	Tan	F	0	0	0	0	0	0	0
1/19/2015	186	1	Section 3	R 1/4 - 33 3/4	I	Cement Floor	S	Light Grey	F	0	598	0	51	0	0	0
1/19/2015	187	1	Section 3	Q 1/2 - 33 3/4	I	Cement Block Wall	R	Tan	F	0	0	0	0	0	0	0
1/19/2015	188	1	Section 3	Q 1/2 - 33 1/2	I	Cement Floor	S	Beige	F	0	0	0	0	0	0.5	0
1/19/2015	189	1	Section 3	O 1/2 - 34	I	Cement Block Wall	R	Tan	F	0	0	0	0	0	0	0
1/19/2015	190	1	Section 3	N 1/4 - 32	I	Cement Floor	S	Light Grey	F	0	691	0	367	0	0	0
1/19/2015	191	1	Section 3	P 1/2 - 32	I	Cement Floor	S	Light Grey	F	0	442	19.1	252	6.7	0	0
1/19/2015	192	1	Section 3	Q 1/2 - 30 1/2	I	Cement Floor	S	Light Grey	F	0	399	0	399	0	0	0
1/19/2015	193	1	Section 3	R - 30 1/4	I	Cement Wall	S	Tan	F	0.21	0	0	0	0	0	0
1/19/2015	194	1	Section 3	M 1/2 - 29 1/2	I	Cement Floor	S	Light Grey	F	0	200	21	407	0	0	0
1/19/2015	195	1	Section 3	M 30 1/2	I	Cement Block Wall	R	Tan	F	0	0	0	0	0	0	0
1/19/2015	196	1	Section 3	L - 32 1/2	I	Cement Block Wall	R	White	F	0	0	0	451	0	0	0.38
1/19/2015	197	1	Section 3	K - 32 1/2	I	Cement Block Wall	R	White	F	0	0	0	301	0	0	0
1/19/2015	198	1	Section 3	K - 31 1/2	I	Cement Floor	S	Beige	F	0	0	0	0	0	0	0
1/19/2015	199	1	Section 3	G - 30 1/2	I	Cement Block Wall	R	White	F	0	0	0	430	0	0	0
1/19/2015	200	1	Section 3	G - 32 1/2	I	Cement Block Wall	R	Beige	F	0	0	0	0	0	0	0
1/19/2015	201	1	Section 3	G 1/2 - 32 1/2	I	Cement Floor	S	Light Grey	F	0	46	2.3	189	0	0	0
1/19/2015	202	1	Section 3	F 1/2 - 30 1/2	I	Cement Floor	S	Light Grey	F	0	80	7.1	278	0	0	0

Date	Test #	Building #	Section & Floor	Location	Int (I) Ext (E)	Substrate	Rough (R) Smooth (S)	Color	Type Gloss (G) Flat (F)	As (ppm)	Ba (ppm)	Cd (ppm)	Cr (ppm)	Hg (ppm)	Se (ppm)	Ag (ppm)
1/19/2015	203	1	Section 3	F 1/2 - 30 1/2	I	Cement Floor	S	Grey	F	0	99	0	433	0	0	0
1/19/2015	204	1	Section 3	G - 31	I	Cement Block Wall	R	Tan	F	0	0	0	0	0	0	0
1/19/2015	205	1	Section 3	H 1/2 - 33	I	Cement Floor	S	Light Grey	F	0	203	14.1	476	0.22	0.89	0
1/19/2015	206	1	Section 3	G - 33 1/2	I	Cement Floor	S	Grey	F	0	287	11.7	294	4.3	0.63	0.41
1/19/2015	207	1	Section 3	G - 32 1/2	I	Cement Block Wall	R	White	F	0	14.7	0	165	0	0	0
1/19/2015	208	1	Section 3	K 1/2 - 32 1/2	I	Cement Block Wall	R	Yellow	F	0	68	0	0	0	0	0
1/19/2015	209	1	Section 3	M - 33	I	Cement Block Wall	R	Tan	F	0	0	0	0	0	0	0
1/19/2015	210	1	Section 3	E 1/2 - 30	I	Cement Floor	S	Blue	F	0	11.8	0	168	0	0	0
1/19/2015	211	1	Section 3	C 1/2 - 29 1/2	I	Cement Floor	S	Blue	F	0.33	0	0	75	0	0	0
1/19/2015	212	1	Section 3	E 1/2 - 31	I	Cement Floor	S	Dark Grey	F	0	0	0	0	0	0	0
1/19/2015	213	1	Section 3	D 1/2 - 31 1/2	I	Cement Block Wall	R	Yellow	F	0	184	37	1106	1.4	0	0
1/19/2015	214	1	Section 3	E - 31 1/2	I	Cement Floor	S	Blue	F	0.48	22	0	0	0	0	0
1/19/2015	215	1	Section 3	B 1/2 - 31 1/2	I	Cement Block Wall	R	Tan	F	0	0	0	0	0	0	0
1/19/2015	216	1	Section 3	A 1/2 = 32	I	Cement Block Wall	R	Tan	F	0	0	0	0	0	0	0
1/19/2015	217	1	Section 3	B - 34	I	Cement Block Wall	R	Tan	F	0.09	0	0	0	0	0	0
1/19/2015	218	1	Section 3	E - 34	I	Cement Block Wall	R	Tan	F	0	0	0	0	0	0	0
1/19/2015	219	1	Section 3	E - 33 1/2	I	Cement Floor	S	Blue	F	0	2.7	0	0	0	0	0
1/19/2015	220	1	Section 3	E 1/2 - 33	I	Cement Floor	S	Pink	F	0	0	41	0	0	0	0
1/19/2015	221	1	Section 3	D 1/2 - 31 1/2	I	Cement Block Wall	R	Tan	F	0	0	0	0	0	0	0
1/19/2015	222	1	Section 3	E - 32 1/2	I	Cement Floor	S	Grey	F	0	18.8	0	289	0	0	0
1/19/2015	223	1	Section 3	F - 32	I	Cement Floor	S	Light Grey	F	0	0	0	269	0	0	0
1/19/2015	224	1	Section 3	F - 3 3/4	I	Cement Block Wall	R	Tan	F	0	0	0	0	0	0	0
1/20/2015	7	1	Section 3	B - 30 Ceiling	I	Concrete	S	White	F	0	0	1.12	479	0.12	0	0
1/20/2015	8	1	Section 3	D - 30 Ceiling	I	Concrete	S	Yellow	F	0	7.3	6.7	0	0.88	0	0
1/20/2015	9	1	Section 3	C - 31 Wall	I	Concrete Block	S	Light Beige	F	0	0	0	0	0	0	0
1/20/2015	10	1	Section 3	C - 31 Wall	I	Concrete Block	S	Yellow	F	0	0	0	0	0	0	0
1/20/2015	11	1	Section 3	G - 30 Ceiling	I	Concrete	S	White	F	0	771	5.6	42	3.1	0	0
1/20/2015	12	1	Section 3	E - 22 Column	I	Concrete	S	Beige	F	0	0	0	0	0	0	0
1/20/2015	13	1	Section 3	E - 22 Roof Deck	I	Concrete	S	White	F	0	539	3	170	0.09	0	0
1/20/2015	14	1	Section 3	B - 33 Roof Deck	I	Concrete	S	White	F	0	602	1.4	365	0	0	0
1/20/2015	15	1	Section 3	B - 23 Column	I	Concrete	S	Beige	F	0	0	9.1	0	0	0	0
1/20/2015	16	1	Section 3	G - 33 Ceiling	I	Concrete	S	White	F	0	690	7.1	32	0	0	0
1/20/2015	17	1	Section 3	G - 32 Ceiling	I	Concrete	S	White	F	0	735	5.5	314	0	0	0
1/20/2015	18	1	Section 3	G-30 Solder	I	Concrete	S	White	F	0.49	1969	79	223	6.7	16	0.6
1/20/2015	19	1	Section 3	G - 30 Ceiling	I	Concrete	S	White	F	0	411	3.4	114	0	0	0
1/20/2015	20	1	Section 3	G - 30 Wall	I	Concrete Block	S	Light Grey	F	0	0	1.3	388	0.12	0	0
1/20/2015	21	1	Section 3	M - 34 Ceiling	I	Concrete	S	White	F	0	512	0	20	0	0	0
1/20/2015	22	1	Section 3	M - 34 Wall	I	Concrete Block	S	Tan	F	0	0	0	0	0	0	0
1/20/2015	49	1	Section 3	N - 34 Ceiling	I	Concrete	S	White	F	0	490	0	277	0	0	8.4
1/20/2015	50	1	Section 3	O - 32 Roof Deck	I	Concrete	S	White	F	0	457	0	330	0	0	0

Date	Test #	Building #	Section & Floor	Location	Int (I) Ext (E)	Substrate	Rough (R) Smooth (S)	Color	Type Gloss (G) Flat (F)	As (ppm)	Ba (ppm)	Cd (ppm)	Cr (ppm)	Hg (ppm)	Se (ppm)	Ag (ppm)
1/20/2015	51	1	Section 3	O - 32 Column	I	Concrete	S	Tan	F	0	0	0	0	0	0	0
1/20/2015	52	1	Section 3	P - 33 Column	I	Concrete	S	Tan	F	0	0	0	0	0	0	0
1/20/2015	53	1	Section 3	Q - 33 Column	I	Concrete	S	Tan	F	0	0	0	0	0	0	0
1/20/2015	54	1	Section 3	Q - 32 Ceiling	I	Concrete	S	White	F	0	350	0	495	0	0	0
1/20/2015	55	1	Section 3	R - 33 Wall	I	Concrete	S	Tan	F	0	33	0	0	6.6	4.7	0
1/20/2015	56	1	Section 3	R - 32 Ceiling	I	Concrete	S	White	F	0	401	17.3	305	3.2	0	0
1/20/2015	57	1	Section 3	S - 30 Roof Deck	I	Concrete	S	White	F	0	422	32	100	5.7	0	0.6
1/20/2015	58	1	Section 3	S - 30 Column	I	Concrete	S	Tan	F	0.98	0	6.1	0	0	5	0
1/20/2015	59	1	Section 3	T - 30 Ceiling	I	Concrete	S	White	F	0	601	29	478	3.3	0	0
1/20/2015	60	1	Section 3	T - 31 Column	I	Concrete	S	Tan	F	0	0	0	0	0	6.9	0
1/20/2015	61	1	Section 3	J - 32 Ceiling	I	Concrete	S	Tan	F	5	73	1.4	0	0	0	0
1/20/2015	62	1	Section 3	W - 31 Roof Deck	I	Concrete	S	White	F	0	557	31	309	4.1	0	0.15
1/20/2015	63	1	Section 3	W - 31 Wall	I	Concrete	S	Tan	F	6.7	91	3.1	0	1.7	0	0
1/20/2015	64	1	Section 3	Z - 33 Ceiling	I	Concrete	S	White	F	0	2.3	0	203	0	0	0
1/20/2015	65	1	Section 3	Z - 33 Roof Deck	I	Concrete	S	White	F	0	88	0	401	0	0	0
1/20/2015	66	1	Section 3	Z -33 Column	I	Concrete	S	White	F	0	7	0	428	0	0	0
1/20/2015	67	1	Section 3	X - 32 Ceiling	I	Concrete	S	Light Tan	F	0	0	1.2	0	0	0	0
1/20/2015	68	1	Section 3	W - 32 Ceiling	I	Concrete	S	White	F	0	4.9	0	174	0.11	0	0
1/20/2015	69	1	Section 3	X - 32 Wall	I	Concrete	S	Light Tan	F	0	0	3.7	0	0	0	0
1/22/2015	225	1	Section 4	X 1/2 - 26	I	Cement Block Wall	R	Tan	F	0	0	0	0	0	0	0
1/22/2015	226	1	Section 4	W - 25 1/2	I	Cement Block Wall	R	Tan	F	0	0	0	0	0	0	0
1/22/2015	227	1	Section 4	X - 25 1/2	I	Cement Floor	S	Blue	F	0	0	0	0	0	0	0
1/22/2015	228	1	Section 4	X - 22	I	Cement Floor	S	Maroon	F	0	0	0	617	0	0	0
1/22/2015	229	1	Section 4	W 1/4 - 22 1/2	I	Cement Floor	S	Blue	F	0	0	0	0	0	0	0
1/22/2015	230	1	Section 4	W - 21	I	Cement Block Wall	R	Black	F	0	0	0	0	0	0	0
1/22/2015	231	1	Section 4	V - 21	I	Cement Block Wall	R	Tan	F	0	0	0	0	0	0	0
1/22/2015	232	1	Section 4	V - 24	I	Cement Block Wall	R	Beige	F	0	0	0	0	0	0	0
1/22/2015	233	1	Section 4	V - 24	I	Cement Block Wall	R	Tan	F	0	0	1.1	0	0	0	0
1/22/2015	234	1	Section 4	W - 25 1/2	I	Cement Block Wall	R	Tan	F	0	0	0	0	0	0	0
1/22/2015	235	1	Section 4	V - 1/2 - 25 1/2	I	Cement Floor	S	Grey	F	0	11.1	0	158	0	0	0.88
1/22/2015	236	1	Section 4	V - 26	I	Cement Floor	S	Yellow	F	0	230	67	1486	48	0	7
1/22/2015	237	1	Section 4	W - 26 1/2	I	Cement Floor	S	Yellow	F	0	408	94	1907	60	0	3.3
1/22/2015	238	1	Section 4	U 1/2 - 26	I	Cement Block Wall	R	Tan	F	0	0	0	0	0	0	0
1/22/2015	239	1	Section 4	V 1/2 - 29	I	Cement Block Wall	R	Tan	F	0	0	0	0	0	0	0
1/22/2015	240	1	Section 4	T - 29	I	Cement Block Wall	R	Tan	F	0	0	0	0	0	0	0
1/22/2015	241	1	Section 4	Q 1/2 - 28 1/2	I	Cement Block Wall	R	Tan	F	0	0	0	0	0	0	0
1/22/2015	242	1	Section 4	R - 28 1/2	I	Cement Floor	S	Black	F	0.03	0	1.3	0	0	0	0
1/22/2015	243	1	Section 4	Q 1/2 - 28 1/2	I	Concrete Wall	S	Tan	F	0	0	0	0	0	0	0
1/22/2015	244	1	Section 4	Q - 26 1/2	I	Cement Block Wall	R	Tan	F	0	0	0	0	0	0	0
1/22/2015	245	1	Section 4	R - 26	I	Cement Block Wall	R	White	F	0	0	0	197	0	0	0

Date	Test #	Building #	Section & Floor	Location	Int (I) Ext (E)	Substrate	Rough (R) Smooth (S)	Color	Type Gloss (G) Flat (F)	As (ppm)	Ba (ppm)	Cd (ppm)	Cr (ppm)	Hg (ppm)	Se (ppm)	Ag (ppm)
1/22/2015	246	1	Section 4	S 1/2 - 26	I	Cement Block Wall	R	Tan	F	0	0	0	0	0	0	0
1/22/2015	247	1	Section 4	Q 1/2 - 25 1/2	I	Cement Block Wall	R	Tan	F	0	0	0	0	0	0	0
1/22/2015	248	1	Section 4	R - 26	I	Flooring	S	Maroon	F	0	0	1.12	0	0	0	0
1/22/2015	249	1	Section 4	Q - 25	I	Cement Block Wall	R	Tan	F	0	0	4.1	0	0	0.77	0
1/22/2015	250	1	Section 4	Q - 24	I	Cement Floor	S	Peach	F	0	0	0	0	0	0	0
1/22/2015	251	1	Section 4	Q 1/2 - 24 1/2	I	Cement Block Wall	R	Tan	F	0	0	0	0	0	0	0
1/22/2015	252	1	Section 4	R 1/2 - 25	I	Cement Block Wall	R	Tan	F	0	0	0	0	0	0	0
1/22/2015	253	1	Section 4	U - 25	I	Cement Block Wall	R	Tan	F	0	0	0	0	0	0	0
1/22/2015	254	1	Section 4	U - 25	I	Cement Block Wall	R	Beige	F	0	0	0	0	0	0	0
1/22/2015	255	1	Section 4	T 1/2 - 23 1/2	I	Cement Block Wall	R	White	F	0	77	7.1	17	2.7	0	0
1/22/2015	256	1	Section 4	T - 23 1/2	I	Cement Block Wall	R	Beige	F	0	0	0	0	0	0	0
1/22/2015	257	1	Section 4	T - 23 1/2	I	Cement Block Wall	R	Tan	F	0	0	0	0	0	0	0
1/22/2015	258	1	Section 4	R 1/2 - 23 1/2	I	Cement Block Wall	R	Tan	F	0	0	0	0	0	0	0
1/22/2015	259	1	Section 4	Q - 21 1/2	I	Cement Block Wall	R	Tan	F	0.9	0	0	0	0	0	0
1/22/2015	260	1	Section 4	S 1/2 - 21 1/2	I	Cement Floor	S	Blue	F	0	0	3.8	153	0	0	0
1/22/2015	261	1	Section 4	Q 1/2 - 22 1/2	I	Cement Floor	S	Blue	F	0	0	2.2	263	0	0	0
1/22/2015	262	1	Section 4	X - 21	I	Cement Block Wall	R	Tan	F	0	0	1.4	0	3.2	0.38	0
1/22/2015	263	1	Section 4	V - 19 1/2	I	Cement Block Wall	R	Tan	F	0	0	2.1	0	4.4	0	0
1/22/2015	264	1	Section 4	V 1/2 - 19	I	Cement Floor	S	Light Grey	F	0	203	0	119	0	0	0
1/22/2015	265	1	Section 4	V - 19	I	Cement Block Wall	R	Tan	F	0	0	4	0	0	0	0
1/22/2015	266	1	Section 4	R - 20 1/2	I	Cement Block Wall	R	Tan	F	0	0	3.3	0	0	0	0
1/22/2015	267	1	Section 4	Q - 20	I	Cement Block Wall	R	Tan	F	0	0	7.1	0	0	0	0
1/22/2015	268	1	Section 4	P 1/2 - 20 1/2	I	Cement Block Wall	R	White	F	0	117	0	0	0	0	0
1/22/2015	269	1	Section 4	O - 23 1/2	I	Cement Floor	S	Off-White	F	0	130	0	2	4.8	0	0
1/22/2015	270	1	Section 4	P 1/2 -29	I	Cement Block Wall	R	Tan	F	0	0	6.8	0	0	0	0
1/22/2015	271	1	Section 4	P 1/2 - 28 1//2	I	Cement Floor	S	Beige	F	0	0	0	0	0	0	0
1/22/2015	272	1	Section 4	O - 29	I	Cement Block Wall	R	Tan	F	1.27	0	0	0	0	0	0
1/22/2015	273	1	Section 4	O 1/2 - 28 1/2	I	Cement Floor	S	Dark Beige	F	0	0	0	0	0	0	0
1/22/2015	274	1	Section 4	P 1/2 - 26	I	Cement Floor	S	Dark Beige	F	0	0	0	0	0	0	0
1/22/2015	275	1	Section 4	P - 25	I	Cement Block Wall	R	Tan	F	0	0	0	0	0	0	0
1/22/2015	276	1	Section 4	P - 25 1/4	I	Cement Floor	S	Dark Beige	F	0	0	0	0	0	0	0
1/22/2015	277	1	Section 4	N 1/2 - 26	I	Cement Block Wall	R	Tan	F	0	0	0	0	0	0	0
1/22/2015	278	1	Section 4	N 1/2 - 22	I	Cement Block Wall	R	Tan	F	0	0	0	0	0	0	0
1/22/2015	279	1	Section 4	M 1/2 - 21	I	Cement Floor	S	Blue	F	0	0	0	0	0	0.07	0
1/22/2015	280	1	Section 4	M 1/2 - 20 1/2	I	Cement Block Wall	R	Tan	F	0	0	0	0	6.1	0.11	0
1/22/2015	281	1	Section 4	K - 20 1/2	I	Cement Block Wall	R	Tan	F	0	0	0	0	3.9	0.12	0
1/22/2015	282	1	Section 4	K - 22	I	Cement Floor	S	Red	F	2.7	387	318	6832.9	37.8	0.04	13.2
1/22/2015	283	1	Section 4	K - 21 3/4	I	Cement Wall	S	Tan	F	0	0	3.1	0	11.1	0.09	0
1/22/2015	284	1	Section 4	O - 20 1/2	I	Cement Block Wall	R	Tan	F	0	0	0	0	0	0	0
1/22/2015	285	1	Section 4	K 1/2 - 23 1/2	I	Cement Floor	S	Red	F	0	410	241	8111.8	40.1	0.67	9.9

Date	Test #	Building #	Section & Floor	Location	Int (I) Ext (E)	Substrate	Rough (R) Smooth (S)	Color	Type Gloss (G) Flat (F)	As (ppm)	Ba (ppm)	Cd (ppm)	Cr (ppm)	Hg (ppm)	Se (ppm)	Ag (ppm)
1/22/2015	286	1	Section 4	K - 24	I	Cement Block Wall	R	Tan	F	0	0	0	0	0	0.3	0
1/22/2015	287	1	Section 4	M - 29	I	Cement Block Wall	R	Tan	F	0	0	0	0	0	1.4	0
1/22/2015	288	1	Section 4	N 1/2 - 25	I	Cement Block Wall	R	Tan	F	0	0	0	0	0	1.1	0
1/22/2015	289	1	Section 4	L - 26	I	Flooring	S	Grey	F	0	22	0	397	0	1.89	0
1/22/2015	290	1	Section 4	L - 26 1/2	I	Flooring	S	Grey	F	0	18.7	0	131	0	1.74	0
1/22/2015	291	1	Section 4	L - 28	I	Cement Slab	S	Hazel	F	0	0	3.1	0	1.1	3.55	0
1/22/2015	292	1	Section 4	K - 25	I	Cement Block Wall	R	White	F	0	0	0	182	0	0	0
1/22/2015	293	1	Section 4	H 1/2 - 28 1/2	I	Cement Floor	S	Beige	F	0	0	0	0	0	0	0
1/22/2015	294	1	Section 4	H - 28	I	Cement Floor	S	Tan	F	0	0	0	0	0	0	0
1/22/2015	295	1	Section 4	H - 25 1/2	I	Cement Floor	S	Beige	F	0	0	0	0	0	0	0
1/22/2015	296	1	Section 4	H 1/2 - 25 1/2	I	Cement Block Wall	R	Tan	F	0	0	0	0	0	0	0
1/22/2015	297	1	Section 4	J - 28	I	Cement Floor	S	Hazel	F	0	0	3.7	0	0	0	0
1/22/2015	298	1	Section 4	F 1/2 - 25	I	Cement Floor	S	Grey	F	0	0	0	245	0	0	0
1/22/2015	299	1	Section 4	G 1/2 - 25	I	Cement Block Wall	R	Tan	F	0	0	0	0	0	0	0
1/22/2015	300	1	Section 4	J - 24	I	Cement Block Wall	R	Baby Blue	F	0	699	21	123	0	0	0
1/22/2015	301	1	Section 4	H 1/2 - 24	I	Cement Floor	S	Grey	F	0	0	0	180	1.1	0	0
1/22/2015	302	1	Section 4	G - 21	I	Cement Floor	S	Grey	F	0	0	0	145	3.6	0	0
1/22/2015	303	1	Section 4	11 1/2 - 20 1/2	I	Cement Floor	S	Blue	F	0	0	0	471	0	0	0
1/22/2015	304	1	Section 4	J - 21 1/2	I	Cement Block Wall	R	Baby Blue	F	0.11	870	36	442	0	0	0.7
1/22/2015	305	1	Section 4	J - 24	I	Cement Block Wall	R	Tan	F	0	0	0	0	0	0	0
1/22/2015	306	1	Section 4	G 1/2 - 29	I	Cement Floor	S	Blue	F	0	0	0	466	0	0	0
1/22/2015	307	1	Section 4	G 1/2 - 26 1/2	I	Cement Floor	S	Light Grey	F	0	0	6.7	53	0	0	0
1/22/2015	308	1	Section 4	H - 26	I	Cement Block Wall	R	tan	F	0	0	0	0	0	0	0
1/22/2015	309	1	Section 4	G 1/2 - 27 1/2	I	Cement Floor	S	Dark Grey	F	0	0	3.4	158	3.8	0	0
1/22/2015	310	1	Section 4	F - 28 1/2	I	Cement Floor	S	Light Grey	F	0	0	4	246	9.1	0	0
1/22/2015	311	1	Section 4	C 1/2 - 27 1/2	I	Brick Floor	R	Black	F	0	0	0	0	0	0	0
1/22/2015	312	1	Section 4	B - 25 1/2	I	Cement Floor	S	Light Grey	F	0.63	301	9.9	0	7	0	0
1/22/2015	313	1	Section 4	D 1/2 - 26 1/2	I	Cement Floor	S	Light Grey	F	0.89	280	13.6	0	8.4	0	0
1/22/2015	314	1	Section 4	C - 25	I	Cement Block Wall	R	Beige	F	0.71	0	0	0	0	0	0
1/22/2015	315	1	Section 4	D 1/2 - 25	I	Cement Block Wall	R	Tan	F	6.4	0	0	0	0	0	0
1/23/2015	316	1	Section 5	W 1/2 - 10	I	Cement Block Wall	R	Tan	F	0	0	0	0	0	0	0
1/23/2015	317	1	Section 5	S 1/2 - 10	I	Cement Block Wall	R	Tan	F	0	0	0	0	0	0	0
1/23/2015	318	1	Section 5	R - 12	I	Cement Block Wall	R	Tan	F	0.99	0	0	0	0	0	0
1/23/2015	319	1	Section 5	R - 16	I	Cement Block Wall	R	Tan	F	0	0	0	0	0	0	0
1/23/2015	320	1	Section 5	G - 19	I	Cement Block Wall	R	Tan	F	0.84	0	0	0	0	0	0
1/23/2015	321	1	Section 5	G - 18	I	Cement Block Wall	R	Tan	F	0	0	0	0	0	0	0
1/23/2015	322	1	Section 5	J - 18	I	Cement Block Wall	R	Tan	F	0.71	0	0	0	0	0	0
1/23/2015	323	1	Section 5	H 1/2 - 19 1/2	I	Cement Block Wall	R	Tan	F	0	0	0	0	0	0	0
1/25/2015	149	1	Section 5	U - 17 Column	I E	Concrete	S	Tan	F	0	0	0	0	0	0	0
1/25/2015	150	1	Section 5	U - 17 Ceiling	I E	Concrete	S	White	F	0	55	0	245	0.99	0	0.1

Date	Test #	Building #	Section & Floor	Location	Int (I) Ext (E)	Substrate	Rough (R) Smooth (S)	Color	Type Gloss (G) Flat (F)	As (ppm)	Ba (ppm)	Cd (ppm)	Cr (ppm)	Hg (ppm)	Se (ppm)	Ag (ppm)
1/25/2015	151	1	Section 5	U - 17 Roof Deck	I E	Concrete	S	White	F	0	47	0	337	6.7	0	0.33
2/17/2015	17	1	Section 4	G - 27 Roof Deck	I	Concrete	S	White	F	0	19.8	0	82	2.3	0	0
2/17/2015	18	1	Section 4	G - 25 Ceiling	I	Concrete	S	White	F	0	2.5	0	221	0.84	0	0.48
2/17/2015	19	1	Section 4	G - 25 Upper Wall	I	Concrete	R	Yellow	F	0	98	54	886	0	0	0
2/17/2015	20	1	Section 4	G - 25 Upper Wall	I	Concrete	R	Yellow	F	0	81	40	749	0	0	0
2/17/2015	21	1	Section 4	G - 25 Lower Wall	I	Concrete Block	R	Beige	F	0	0	0	0	0	0	0
2/17/2015	22	1	Section 4	G - 26 Lower Wall	I	Concrete	R	Beige	F	0	0	0	0	0	0	0
2/17/2015	23	1	Section 4	G - 26 Roof Deck	I	Concrete	S	White	F	0	37	0	443	0	0	0
2/17/2015	24	1	Section 4	E - 26 Roof Deck	I	Concrete	S	Beige	F	0	0	0	0	0	0	0
2/17/2015	25	1	Section 4	B - 27 Roof Deck	I	Concrete	S	Yellow	F	0	104	33	120	0	0	0
2/17/2015	26	1	Section 4	B - 27 Roof Deck	I	Concrete	S	Yellow	F	0	67	18	310	0	0	0
2/17/2015	27	1	Section 4	B - 27 Roof Deck	I	Concrete	S	Yellow	F	0	3.7	9.6	174	0.67	0.2	0
2/17/2015	28	1	Section 4	D - 25 Wall	I	Concrete Block	S	Yellow	F	0	6.6	24	26	0	0	0
2/17/2015	29	1	Section 4	D - 25 Wall	I	Concrete Block	S	White	F	0	50	0	254	0	0	0
2/17/2015	30	1	Section 4	E - 26 Ceiling	I	Concrete	S	White	F	0	2.7	0	150	0	0	0
2/17/2015	31	1	Section 4	E - 27 Ceiling	I	Concrete	S	White	F	0	3.8	0	279	3.7	0	0
2/17/2015	32	1	Section 4	E - 26 Column	I	Concrete	S	Dark Yellow	F	0	0	19.8	140	0	0	0
2/17/2015	33	1	Section 4	E - 26 Column	I	Concrete	S	Beige	F	0	0	0	0	0	0	0
2/17/2015	34	1	Section 4	F - 28 Roof Deck	I	Concrete	S	White	F	0.06	0	0	252	0	0	0
2/17/2015	35	1	Section 4	E - 29 Roof Deck	I	Concrete	S	White	F	3.1	0	0	175	0	0	0
2/17/2015	36	1	Section 4	J - 28 Column	I	Concrete	S	Tan	F	0	0	0	0	0	0	0
2/17/2015	37	1	Section 4	G - 21 Roof Deck	I	Concrete	S	White	F	0.01	0	0	150	0	0	0
2/17/2015	38	1	Section 4	G - 21 Column	I	Concrete	S	Light Blue	F	0	0	3.3	51	2.3	0	0
2/17/2015	41	1	Section 4	J - 22 Ceiling	I	Concrete	S	White	F	0.97	0	0	0	0	0.61	0.8
2/17/2015	42	1	Section 4	J - 22 Wall	I	Concrete Block	R	Light Blue	F	0	4.9	14	211	3.4	0	0
2/17/2015	43	1	Section 4	J - 22 Column	I	Concrete	S	Light Blue	F	0	0	7.9	482	4.1	0	0
2/17/2015	44	1	Section 4	J - 22 Column	I	Concrete	S	Light Blue	F	0	0	4.8	371	3.9	0	0
2/17/2015	45	1	Section 4	J - 24 Ceiling	I	Concrete	S	White	F	0	0	0	174	0	0	0
2/17/2015	46	1	Section 4	J - 24 Roof Deck	I	Concrete	S	White	F	0	0	0	24	0	0	0
2/17/2015	47	1	Section 4	H - 21 Wall	I	Concrete Block	S	Light Blue	F	0	0	5.1	495	4.1	0	0
2/17/2015	48	1	Section 4	H - 21 Wall	I	Concrete Block	S	Light Blue	F	0	0	1.9	366	6.9	0	0
2/17/2015	49	1	Section 4	J - 23 Ceiling	I	Concrete	S	White	F	0	0	0	209	0	0	0
2/17/2015	50	1	Section 4	J - 23 Roof Deck	I	Concrete	S	White	F	0	0	0	292	0	0	0
2/17/2015	51	1	Section 4	J - 23 Column	I	Concrete	S	Tan	F	0	0	0	0	0	0	0
2/17/2015	52	1	Section 4	J - 23 Column	I	Concrete	S	Tan	F	0	0	0	0	0	0	0
2/17/2015	53	1	Section 4	J - 22 Ceiling	I	Concrete	S	White	F	0	0	0	23	0	0	0
2/17/2015	54	1	Section 4	J - 22 Rood Deck	I	Concrete	S	White	F	0	0	0	397	0	0	0
2/17/2015	55	1	Section 4	J - 22 Wall	I	Concrete Block	S	Tan	F	0	0	0	0	0	0	0
2/17/2015	56	1	Section 4	L - 21 Roof Deck	I	Concrete	S	White	F	0	0	0	263	0	0.11	0
2/17/2015	57	1	Section 4	L - 21 Ceiling	I	Concrete	S	White	F	0	55	2.1	435	0	0	0

Date	Test #	Building #	Section & Floor	Location	Int (I) Ext (E)	Substrate	Rough (R) Smooth (S)	Color	Type Gloss (G) Flat (F)	As (ppm)	Ba (ppm)	Cd (ppm)	Cr (ppm)	Hg (ppm)	Se (ppm)	Ag (ppm)
2/17/2015	58	1	Section 4	L -21 Wall	I	Concrete Block	S	Tan	F	0	0	0	0	0	0	0
2/17/2015	59	1	Section 4	L - 22 Column	I	Concrete	S	Tan	F	0	0	0	0	0	0	0
2/17/2015	60	1	Section 4	N - 21 Ceiling	I	Concrete	S	White	F	0	68	3.7	320	0	0.48	6.1
2/17/2015	61	1	Section 4	N - 21 Roof Deck	I	Concrete	S	White	F	0	0	1.4	157	0	0	0
2/17/2015	62	1	Section 4	N - 21 Wall	I	Concrete Block	S	Tan	F	0	0	0	0	0	0	0
2/17/2015	63	1	Section 4	N - 21 Column	I	Concrete	S	Tan	F	0	0	0	0	0.18	0	0
2/17/2015	64	1	Section 4	N - 21 Roof Deck	I	Concrete	S	White	F	0	0	5	74	0	0	0
2/17/2015	65	1	Section 4	N - 21 Roof Deck	I E	Concrete	S	White	F	1	0	9.7	201	0	0.3	0
2/17/2015	66	1	Section 4	N - 21 Wall	I	Concrete Block	S	Tan	F	0	0	0	0	0	0	0
2/17/2015	67	1	Section 4	N - 21 Wall	I E	Concrete Block	S		F	0	0	0	144	0	0	0
2/17/2015	68	1	Section 4	N - 21 Ceiling	I	Concrete	S	White	F	0	104	0	261	2.1	0	0
2/17/2015	69	1	Section 4	O - 22 Column	I	Concrete	S	Tan	F	0.07	0	0	0	0	0	0
2/17/2015	121	1	Section 4	Q - 29 Wall	I	Concrete Block	S	Tan	F	0	0	0	0	0	0	0.33
2/17/2015	122	1	Section 4	O - 29 Ceiling	I	Concrete	S	White	F	0	211	0	82	3.1	0	0
2/17/2015	123	1	Section 4	L - 27 Roof Deck	I	Concrete	S	White	F	0	0	0	13	8.7	0	0
2/17/2015	124	1	Section 4	K - 26 Roof Deck	I	Concrete	S	White	F	0.08	0	0	15	6.6	0	0
2/17/2015	125	1	Section 4	K - 26 Roof Deck	I	Concrete	S	White	F	0	0	0	449	3.9	0	0
2/17/2015	126	1	Section 4	K - 25 Wall	I	Concrete Block	S	Tan	F	0	0	0	0	0	0	0
2/17/2015	127	1	Section 4	R - 28 Ceiling	I	Concrete	S	White	F	0	140	17.6	491	6.1	5.1	0
2/17/2015	128	1	Section 4	R - 28 Ceiling	I	Concrete Block	S	Tan	F	0	0	1.12	0	0	0	0
2/17/2015	129	1	Section 4	Q - 28 Roof Deck	I	Concrete	S	Tan	F	0	0	6.9	0	7.7	7	0.91
2/17/2015	130	1	Section 4	Q - 28 Wall	I	Concrete	S	Tan	F	0	0	0	0	0	0	0
2/17/2015	131	1	Section 4	S - 25 Roof Deck	I	Concrete	S	White	F	0	0	0	116	0	0	0
2/17/2015	132	1	Section 4	T - 24 Ceiling	I	Concrete	S	White	F	0	0	0	263	0	0	0
2/17/2015	133	1	Section 4	T - 24 Roof Deck	I	Concrete	S	White	F	0	0	0	457	0	0	0
2/17/2015	134	1	Section 4	V - 25 Wall	I	Concrete Brick	S	Beige	F	0	0	0	0	0	0	0
2/17/2015	135	1	Section 4	V - 25 Wall	I	Concrete Brick	S	Tan	F	0	0	0	0	0	0	0
2/17/2015	136	1	Section 4	V - 25 Wall	I	Concrete Brick	S	Light Beige	F	0	0	0	0	0	0	0
2/17/2015	137	1	Section 4	U - 25 Wall	I	Concrete Brick	S	Brown	F	0.6	0	3.1	0	3.7	0	0
2/17/2015	138	1	Section 4	U - 25 Wall	I	Concrete Brick	S	Brown	F	0	0	1.8	0	0	0	0
2/17/2015	139	1	Section 4	V - 25 Ceiling	I	Concrete	S	White	F	0	48	0	393	0	0	0
2/17/2015	140	1	Section 4	X 23 Ceiling	I	Concrete	S	White	F	0	92	0	340	0	0	0
2/17/2015	141	1	Section 4	X 23 Ceiling	I	Concrete	S	Tan	F	0	0	0	99	0	0	0
2/17/2015	142	1	Section 4	R - 22 Roof Deck	I	Concrete	S	White	F	0	0	0	114	0	0	0
2/17/2015	143	1	Section 4	R - 22 Column	I	Concrete	S	Beige	F	0	0	0	0	0	0	0
2/17/2015	144	1	Section 4	W - 21 Wall	I	Concrete Block	S	Tan	F	0	0	0	0	0	0	0
2/17/2015	145	1	Section 4	W - 21 Wall	I	Concrete Block	S	Beige	F	0	0	16.9	0	3.3	0.63	0
2/17/2015	146	1	Section 4	W - 21 Ceiling	I	Concrete	S	White	F	0	668	0	218	0	0	0
2/17/2015	147	1	Section 4	V - 19 Wall	I	Concrete Block	S	White	F	0	0	0	9	0	0	0
2/17/2015	148	1	Section 4	U - 20 Ceiling	I	Concrete	S	White	F	0	470	0	129	0	0	0

Date	Test #	Building #	Section & Floor	Location	Int (I) Ext (E)	Substrate	Rough (R) Smooth (S)	Color	Type Gloss (G) Flat (F)	As (ppm)	Ba (ppm)	Cd (ppm)	Cr (ppm)	Hg (ppm)	Se (ppm)	Ag (ppm)
2/23/2015	58	1	Section 1	E- 46 Ceiling	I	Concrete	S	White	F	0.03	336	0	263	0	0	0
2/23/2015	59	1	Section 1	E - 47 Column	I	Concrete	S	Light Beige	F	0	0	0	0	6	0	0
2/23/2015	60	1	Section 1	E - 47 Column	I	Concrete	S	Orange	F	0	0	83	44	0	0	0
2/23/2015	61	1	Section 1	E -47 Column	I	Concrete	S	Tan	F	0	0	7.3	0	6.8	0	0
2/23/2015	62	1	Section 1	H-49 Roof Deck	I	Concrete	S	White	F	0	501	0	166	0	0	0
2/23/2015	63	1	Section 1	H - 49 Column	I	Concrete	S	Tan	G	0	0	10.8	0	7.1	0	0
2/23/2015	64	1	Section 1	H - 49 Column	I	Concrete	S	Tan	F	0	0	4.1	0	3.8	0	0
2/23/2015	65	1	Section 1	F - 49 Roof Deck	I	Concrete	S	White	F	0	0	0	359	0	0	0
2/23/2015	66	1	Section 1	F - 49 Column	I	Concrete	S	Beige	F	0	0	0	0	4.2	0	0
2/23/2015	67	1	Section 1	F - 49 Column	I	Concrete	S	Tan	F	0	0	8.8	0	2.1	0	0
2/23/2015	68	1	Section 1	E - 50 Roof Deck	I	Concrete	S	White	F	0	0	0	249	0	0	0
2/23/2015	69	1	Section 1	F - 45 Roof Deck	I	Concrete	S	White	F	0	0	0	289	0	0	0
2/23/2015	70	1	Section 1	M - 46 Ceiling	I	Concrete	S	White	F	0.17	580	0	332	0	0	0
2/23/2015	71	1	Section 1	J - 46 Column	I	Cement Block	S	White	G	0	0	0	71	0	0	0
2/23/2015	72	1	Section 1	K - 47 Wall	I	Concrete	S	White	F	0	0	0	265	0	0	0
2/23/2015	73	1	Section 1	N- 49 Roof Deck	I	Concrete	S	White	F	0	0	0	180	0	0	0
2/23/2015	74	1	Section 1	O - 47 Roof Deck	I	Concrete	S	White	F	0	0	0	301	0	0	0
2/23/2015	75	1	Section 1	O - 48 Roof Deck	I	Concrete	S	Tan	F	0	0	0.73	0	0	0	0
2/23/2015	76	1	Section 1	R - 49 Roof Deck	I	Concrete	S	White	F	0	0	0	309	0	0	0
2/23/2015	77	1	Section 1	R - 49 Wall	I	Concrete	S	Tan	F	0	0	1.2	0	0	0	0
2/23/2015	78	1	Section 1	T - 50 Roof Deck	I	Concrete	S	White	F	0	319	0	287	0	0	0
2/23/2015	79	1	Section 1	S - 50 Wall	I	Cement Block	S	Beige	F	0	0	0	0	0	0	0
2/23/2015	80	1	Section 1	S- 50 Wall	I	Cement Block	S	Tan	F	0	0	0	0	0	0	0
2/24/2015	26	1	Section 1	S - 48 Column	I	Concrete	S	Tan	G	0	0	0	0	0	0	0
2/24/2015	27	1	Section 1	U - 49 Column	I	Concrete	S	Red	G	0	1190	270	5617.8	83	0	19.5
2/24/2015	28	1	Section 1	U - 49 Column	I	Concrete	S	Tan	F	0	0	1.6	0	0	0	0
2/24/2015	29	1	Section 1	U - 49 Ceiling	I	Concrete	S	White	F	0	308	0	401	0	0	0
2/24/2015	30	1	Section 1	X - 49 Roof Deck	I	Concrete	S	White	F	0	0	0	202	0	0	0
2/24/2015	31	1	Section 1	X - 49 Wall	I	Cement Block	S	Tan	F	0	0	8.3	0	0	0	0
2/24/2015	32	1	Section 1	AA - 50 Ceiling	I	Concrete	S	White	F	0	6.8	0	396	0	0	0
2/24/2015	33	1	Section 1	Z - 48 Column	I	Concrete	S	Tan	F	0	0	0	0	0	0	0
2/24/2015	34	1	Section 1	T - 48 Column	I	Concrete	S	Tan	F	0	0	0	0	0	0	0
4/11/2015	351	5		A10	I E	Cement Block Wall	R S	Off-White	G F	0	0	0	426	0	0	0
4/11/2015	352	5		B10	I E	Cement Floor	R S	Light Grey	G F	0	0	0	441	0	0	0
4/11/2015	353	5		E9	I E	Cement Floor	R S	Grey	G F	0	0	0	355	0	0	0
4/11/2015	354	5		F7	I E	Concrete Column	R S	Light Grey	G F	0	0	2.2	241	0	0	0.14
4/11/2015	355	5		F6	I E	Cement Block Wall	R S	Off-White	G F	0	0	3.1	0	0	0	0
4/11/2015	356	5		F5	I E	Raised Cement Floor	R S	Black	G F	0	0	0	0	0	0	0
4/11/2015	357	5		A4	I E	Cement Block Wall	R S	Dark Grey	G F	0	0	0	0	0	0	0
4/11/2015	358	5		A10	I E	Cement Block Wall	R S	Off-White	G F	0	0	5.1	300	0	0	0

Date	Test #	Building #	Section & Floor	Location	Int (I) Ext (E)	Substrate	Rough (R) Smooth (S)	Color	Type Gloss (G) Flat (F)	As (ppm)	Ba (ppm)	Cd (ppm)	Cr (ppm)	Hg (ppm)	Se (ppm)	Ag (ppm)
4/11/2015	359	5		AB1	I E	Cement Floor	R S	Grey	G F	0	0	0	64	0	0	0
4/11/2015	360	5		E1	I E	Cement Block Wall	R S	Off-White	G F	0	2	8.1	214	0	0	0
4/11/2015	361	5		E1	I E	Cement Floor	R S	Yellow	G F	0	0	0	48	0	0	0
4/11/2015	362	5		E4	I E	Cement Block Wall	R S	Off-White	G F	0	3.7	9	334	0	0	0
4/11/2015	363	5		Lower Level	I E	Concrete Wall	R S	Off-White	G F	0	0	10.3	170	0	0	0
4/11/2015	364	5		Lower Level	I E	Cement Floor	R S	Grey	G F	0	0	0	0	0	0.04	0
4/11/2015	365	5		Lower Level	I E	Concrete Wall	R S	Yellow	G F	0	417	44	361	0	0	0
4/11/2015	366	5		Lower Level	I E	Cement Block Wall	R S	Yellow	G F	0	501	80	375	0	0	0
4/11/2015	367	5		A4	I E	Cement Floor	R S	Dark Grey	G F	0	0	0	0	0	0	0
4/11/2015	368	5		A4	I E	Cement Block Wall	R S	Off-White	G F	0	0	6.1	458	0	0	0
4/11/2015	369	5		AB1	I E	Concrete Wall	R S	Tan	G F	0	0	0	0	0	0	0
4/11/2015	370	5		B2	I E	Cement Floor	R S	Yellow	G F	0	0	0	332	0	0	0
4/11/2015	371	5		C1	I E	Concrete Column	R S	Off-White	G F	0	0	0	177	0	0	0
4/11/2015	372	5		DE2	I E	Cement Block on Floor	R S	Yellow	G F	0	0	0	0	0	0	0
4/11/2015	373	5		F2	I E	Concrete Wall	R S	Off-White	G F	0	0	0	395	9.7	0	0
4/11/2015	374	5		D5	I E	Cement Floor	R S	Grey	G F	0	0	0	497	0	0	0
4/11/2015	375	5		F7	I E	Cement Floor	R S	Off-White	G F	0	0	0	217	8.8	0	0
4/11/2015	376	5		B9	I E	Cement Floor	R S	Grey	G F	0	0	0	335	0	0	0
4/11/2015	377	5		A9	I E	Concrete Wall	R S	Off-White	G F	0	13.1	6.7	264	11.4	0	0.59
4/11/2015	378	5		AB7	I E	Cement Block	R S	Tan	G F	0	0	0	0	0	0	0
4/2/2015	30	6		Stairwell 1	I	Cement Block Wall	R	Off-White	F	0.65	0	0	381	0	0	0
4/2/2015	31	6		Stairwell 2	I	Cement Block Wall	R	Off-White	F	0	0	0	290	0	0	0
12/11/2014	269	13		D 1	I	Cement Block Wall	R	Tan	F	0	0	1.1	0	6.9	0.11	0.73
12/11/2014	270	13		C 1	I	Cement Block Wall	R	Tan	F	0	0	0	0	4.1	0	0
12/11/2014	271	13		C 1	I	Cement Block Wall	R	Tan	F	0	0	0	0	19.8	0	0
12/11/2014	272	13		BC 3	I	Cement Block Wall	R	Tan	F	0	0	0	0	4.3	0	0
12/11/2014	273	13		C 3	I	Cement Block Wall	R	Tan	F	0	0	0	0	11.1	0	0
12/11/2014	274	13		G 3	I	Cement Block Wall	R	Tan	F	0	0	0	0	6.3	0	0
12/11/2014	275	13		H 3	I	Cement Block Wall	R	Tan	F	0	0	0	0	8.8	0	0
12/11/2014	334	13		G 3.5	I	Cement Floor	S	Maroon	F	0	88	0	296	0	0	0
12/11/2014	335	13		G 3.6	I	Cement Floor	S	Grey	F	0	0	0	234	0	0	0
12/11/2014	336	13		F 3.5	I	Cement Floor	S	Yellow	F	0	9.7	8.2	203	0	0	0
12/11/2014	337	13		F 3.5	I	Cement Floor	S	Red	F	2.08	14.1	270	6620.8	187	0	17.7
12/11/2014	338	13		F 3.5	I	Cement Block Wall	R	Tan	F	0	0	0	0	0	0	0
12/11/2014	339	13		C 3.5	I	Cement Block Wall	R	Tan	F	0	0	0	0	0	0	0
12/11/2014	340	13		C 3.5	I	Cement Floor	S	Maroon	F	0	0	0	0	0	0	0
12/11/2014	341	13		G 7	I	Cement Block Wall	R	Tan	F	0	0	0	0	0	0	0
12/11/2014	342	13		G 8	I	Cement Floor	S	Grey	F	0	0	0	122	0	0	0
12/11/2014	343	13		HJ 7	I	Cement Block Wall	R	Tan	F	0	0	1.6	0	0.87	0.36	0
12/11/2014	344	13		J 6	I	Cement Block Wall	R	Tan	F	0	0	0	0	0	0	0

Date	Test #	Building #	Section & Floor	Location	Int (I) Ext (E)	Substrate	Rough (R) Smooth (S)	Color	Type Gloss (G) Flat (F)	As (ppm)	Ba (ppm)	Cd (ppm)	Cr (ppm)	Hg (ppm)	Se (ppm)	Ag (ppm)
12/11/2014	345	13		J 6	I	Cement Floor	S	Yellow	F	0	0	0	213	0	0	0
12/11/2014	346	13		J 6	I	Cement Block Wall	R	Beige	F	0	0	0	0	0	0	0
12/11/2014	347	13		J 6	I	Cement Block Wall	R	Tan	F	0	0	0	0	0	0	0
12/11/2014	348	13		J 6	I	Cement Floor	S	Grey	F	0	0	0	69	0	0	0
12/11/2014	349	13		J 5.5	I	Cement Block Wall	R	Pink	F	0	0	0	0	0	0	0
12/11/2014	350	13		J 5.5	I	Cement Floor	S	Dark Grey	F	0	0	0	0	0	0	0
12/11/2014	351	13		J 4.5	I	Cement Floor	S	Grey	F	0	0	0	387	0	0	0
12/11/2014	352	13		J 5	I	Cement Floor	S	Dark Grey	F	0	0	0	0	0	0	0
12/11/2014	353	13		J 4	I	Cement Block Wall	R	Beige	F	0	0	0	0	0	0	0
12/11/2014	354	13		J 4	I	Cement Block Wall	R	Tan	F	0	0	0	0	0	0	0
12/11/2014	355	13		J 4	I	Cement Floor	S	Grey	F	0	0	0	10	0	0	0.08
12/11/2014	356	13		J 4.5	I	Cement Block Wall	R	Tan	F	0	0	0	0	0	0	0
12/11/2014	357	13		G 4	I	Cement Block Wall	R	Tan	F	0	0	0	0	0	0	0
12/11/2014	358	13		G 4	I	Cement Floor	S	Grey	F	0	0	0	17	0	0	0
12/11/2014	359	13		G 5.5	I	Cement Floor	S	Yellow	F	0	3.3	0	201	16.8	0	0
12/11/2014	360	13		G 7	I	Cement Floor	S	Grey	F	0	0	0	294	0	0	0
12/11/2014	361	13		HJ 6	I	Cement Block Wall	R	Tan	F	0	0	0	0	0	0	0
12/11/2014	362	13		FG 8.5	I	Cement Floor	S	Grey	F	0	18.7	0	417	0	0.71	0
12/11/2014	363	13		G 9	I	Cement Floor	S	Yellow	F	0	1.2	0	0	14.5	0	0
12/11/2014	364	13		F 8.5	I	Cement Floor	S	Light Brown	F	0	0	0	0	0	0	0
12/11/2014	365	13		F 8.5	I	Cement Floor	S	Dark Brown	F	0	0	0	0	0	0	0
12/11/2014	366	13		F 7	I	Cement Floor	S	Grey	F	0	0	0	217	0	0	0
12/11/2014	367	13		F 8	I	Cement Floor	S	Red	F	3.7	91	0	7489	140	0	6.1
12/11/2014	368	13		E 9	I	Cement Raised Floor (Slab)	S	Yellow	F	0	0	0	324	3.4	0	0
12/11/2014	369	13		E 9	I	Cement Floor	S	Grey	F	0	0	0	267	0	0	0
12/11/2014	370	13		EF 8	I	Cement Floor	S	Grey	F	0	0	0	371	0	0	0
12/11/2014	371	13		E 7	I	Cement Block Wall	R	Tan	F	0.5	0	0	0	0	0	0
12/11/2014	372	13		D 8	I	Cement Floor	S	Grey	F	0	0	0	498	0	0	0
12/11/2014	373	13		B 8	I	Cement Block Wall	R	Tan	F	0	0	3.8	144	0	0	0
12/11/2014	374	13		B 9	I	Cement Floor	S	Grey	F	0	0	0	356	0	0	0
12/11/2014	375	13		AB 8 (Upstair)	I	Cement Block Wall	R	White	F	0	0	0	254	0	0	0
12/11/2014	376	13		A 8.5	I	Cement Block Wall	R	White	F	0	0	0	425	0	0	0
12/11/2014	377	13		B 8	I	Cement Floor	S	Grey	F	0.61	0	0	360	0	0	0
12/11/2014	378	13		B 8	I	Cement Raised Floor	S	Yellow	F	0	0	30	1638	69	0	3.5
12/11/2014	379	13		B 7.5	I	Cement Floor	S	Grey	F	0	1.3	0	56	18.7	0	0
12/11/2014	380	13		B 7.5	I	Cement Block Wall	R	Tan	F	0	0	0	0	0	0	0
12/11/2014	381	13		A 7.5	I	Cement Block Wall	R	Tan	F	0	0	0	0	0	0	0
12/11/2014	382	13		B 7	I	Cement Block Wall	R	Brown	F	0	0	0	0	0	0	0
12/11/2014	383	13		B 7	I	Cement Floor	S	Grey	F	0	5.4	0	245	13.6	0	0
12/11/2014	384	13		Hallway D 7	I	Cement Floor	S	Grey	F	0	6.8	0	351	8.7	0	0

Date	Test #	Building #	Section & Floor	Location	Int (I) Ext (E)	Substrate	Rough (R) Smooth (S)	Color	Type Gloss (G) Flat (F)	As (ppm)	Ba (ppm)	Cd (ppm)	Cr (ppm)	Hg (ppm)	Se (ppm)	Ag (ppm)
12/11/2014	385	13		G 4.5	I	Cement Block Wall	R	Tan	F	0	0	0	0	0	0	0
12/11/2014	386	13		G 3.5	I	Cement Block Wall	R	Tan	F	0	0	0	0	0	0	0
12/11/2014	387	13		E 3.5	I	Cement Block Wall	R	Tan	F	0	0	4.1	0	0	0.08	0
12/11/2014	388	13		D 6.5	I	Cement Block Wall	R	Tan	F	0	0	0	0	0	0	0
12/11/2014	389	13		C 3.5	I	Cement Block Wall	R	Tan	F	0	0	0	0	0	0	0
12/11/2014	390	13		C 3.5	I	Cement Floor	S	Grey	F	0	14.7	5.9	239	19.1	0	0
12/11/2014	391	13		C 6	I	Cement Block Wall	R	tan	F	0	0	0	0	0	0	0
12/11/2014	392	13		D 6	I	Cement Floor	S	Maroon	F	0	0	16.7	259	14.1	0	0
12/11/2014	393	13		D 7	I	Cement Block Wall	R	Tan	F	0	0	0	0	0	0	0
12/11/2014	394	13		C 7	I	Cement Floor	S	Maroon	F	0.8	16.4	19.4	270	0	0	0
12/11/2014	395	13		C 65	I	Cement Block Wall	R	Tan	F	0	0	0	0	0	0	0
12/11/2014	396	13		C 6	I	Cement Block Wall	R	Tan	F	0	0	0	0	0	0	0
12/11/2014	397	13		A 7	I	Cement Block Wall	R	Tan	F	0	0	0	0	0	0.01	0
12/11/2014	398	13		A 5	I	Cement Block Wall	R	Tan	F	0	0	0	0	0	0	0
12/11/2014	399	13		Hallway A 6	I	Cement Block Wall	R	Tan	F	0	0	0	0	0	0	0
12/11/2014	400	13		Hallway A 4	I	Cement Block Wall	R	Tan	F	0	0	0	0	0	0	0
12/15/2014	442	14		B	I	Cement Wall	S	Tan	G F	0	0	0	0	0	0	0
12/15/2014	443	14		B	I	Cement Block Wall	R	Tan	G F	0	0	0	0	0	0	0
12/15/2014	444	14		B	I	Cement Wall	S	Tan	G F	0	0	0	0	0	0	0
12/15/2014	445	14		B	I	Cement Wall	S	Tan	G F	0	0	0	0	0	0	0
12/15/2014	446	14		B	I	Cement Floor	S	Grey	G F	0	7.7	0	63	0	0	0
12/15/2014	447	14		B	I	Cement Wall	S	Tan	G F	0	0	0	0	0	0	0
12/15/2014	448	14		D	I	Cement Block Wall	R	Tan	G F	0	0	0	0	0.25	0	0.03
12/15/2014	449	14		D	I	Cement Wall	S	Tan	G F	0	0	0	0	0	0	0
12/15/2014	450	14		D	I	Cement Floor	S	Grey	G F	0	3.5	2.4	26	0	0	0
12/15/2014	451	14		D	I	Cement Block Wall	R	Tan	G F	0	0	0	0	1.8	0	0
12/15/2014	452	14		D	I	Cement Wall	S	Tan	G F	0	0	0	0	0	0	0
12/15/2014	453	14		D	I	Cement Block Wall	R	Tan	G F	0	0	0	0	6.6	0	0
12/15/2014	454	14		D	I	Cement Floor	S	Grey	G F	0	9.9	1.8	374	0	0	0.7
12/15/2014	455	14		D	I	Cement Ceiling	S	Tan	G F	0	0	0	0	0	0	0
12/15/2014	456	14		B	I	Cement Block Wall	R	Beige	G F	0	0	0	0	5.1	0	0
12/15/2014	457	14		B	I	Cement Block Wall	R	Tan	G F	0	0	0	0	3.5	0	0
12/15/2014	458	14		B	I	Cement Wall	S	Tan	G F	0	0	0	0	0	0	0
12/15/2014	459	14		B	I	Cement Block Wall	R	Tan	G F	0	0	0	0	9.9	0	0
12/15/2014	460	14		B	I	Cement Block	S	Tan	G F	0.33	0	0	33	0	0	0
12/15/2014	461	14		B	I	Cement Floor	S	Grey	G F	0	14.6	3.1	292	0	0	0
12/15/2014	462	14		D	I	Cement Wall	S	Tan	G F	0	0	0	0	0	0	0
12/15/2014	463	14		D	I	Cement Floor	S	Grey	G F	0	2.2	0	489	0	0	0
12/15/2014	464	14		D	I	Cement Wall	S	Tan	G F	0	0	0	0	0	0	0
12/15/2014	465	14		D	I	Cement Wall	S	Yellow	G F	0	1.5	21	269	3.3	0.69	0.08

Date	Test #	Building #	Section & Floor	Location	Int (I) Ext (E)	Substrate	Rough (R) Smooth (S)	Color	Type Gloss (G) Flat (F)	As (ppm)	Ba (ppm)	Cd (ppm)	Cr (ppm)	Hg (ppm)	Se (ppm)	Ag (ppm)
12/15/2014	466	14		B	I	Cement Wall (upstairs)	S	Tan	G F	0	0	0	16.2	0	0	0
12/15/2014	467	14		D	I	Cement Wall (upstairs)	S	Tan	G F	0	0	0	0	0	0	0
12/15/2014	468	14		B	I	Cement Floor	S	Grey	G F	0	0	0	289	0.12	0	0
12/15/2014	469	14		B	I	Cement Wall	S	Tan	G F	0	0	0	0	0	0	0
12/15/2014	470	14		A	I	Cement Wall	S	Tan	G F	0	0	0	0	0	0	0
12/15/2014	471	14		A	I	Cement Wall	S	Grey	G F	0	0	0	65	0	0	0
12/15/2014	472	14		A	I	Cement Block Wall	R	Tan	G F	0	0	0	0	0	0	0
12/15/2014	473	14		A	I	Cement Wall	S	Dark Grey	G F	0	0	0	189	0.48	0	0
12/15/2014	474	14		A	I	Cement Floor	S	Yellow	G F	0	0	0	0	0	0	0
12/15/2014	475	14		C	I	Cement Wall	S	Grey	G F	0	3.4	0	204	0	0	0.82
12/15/2014	476	14		C	I	Cement Wall	S	Tan	F	0	0	0	0	0	0	0
12/15/2014	477	14		C	I	Cement Stairs	S	Yellow	F	0	47	6.9	410	0	0	0
12/15/2014	478	14		C	I	Cement Ceiling	S	Beige	F	0.26	0	0	77	0	0	0
12/15/2014	479	14		A	I	Cement Block Wall	R	Tan	F	0	0	0	0	0	0	0
12/15/2014	480	14		A	I	Cement Block Wall	R	Grey	F	0	3.7	0	335	0	0	0
12/15/2014	481	14		A	I	Cement Floor	S	Grey	F	0	2.2	0	201	9.7	0.98	0
12/15/2014	482	14		A	I	Cement Wall (Up)	S	White	F	0	94	0	199	0	0	0
12/15/2014	483	14		C	I	Cement Wall (Upstairs)	S	White	F	0	0	0	417	0	0	0
12/15/2014	484	14		C	I	Cement Wall (Upstairs)	S	White	F	0	0	0	261	0	0	0
12/15/2014	485	14		A	I	Cement Floor (Upstairs)	S	Grey	F	0	0	0	410	0	0	0
12/15/2014	486	14		C	I	Cement Wall	S	Grey	F	0	0	0	206	0	0	0
12/15/2014	487	14		C	I	Cement Wall	S	Grey	F	0	0	0	61	0	0	0
12/15/2014	488	14		C	I	Cement Block Wall	R	Tan	F	0	0	0	0	0	0	0
12/15/2014	Rd 441	14		B	I	Cement Floor	S	Grey	G F	0	0	31	437	0	0	1.4
12/18/2014	11	14	Gun Range	XM - A	I	Cement Block Wall	S	Beige	F	0	0	0	0	6.7	0	0
12/18/2014	12	14	Gun Range	XM - A	I	Cement Wall	S	Beige	F	0	0	0	0	3.8	0	0
12/18/2014	13	14	Gun Range	XM - A	I	Cement Floor	S	Light Grey	F	0	0	0	116	4.4	0	0
12/18/2014	14	14	Gun Range	XM - A	I	Cement Block Wall	S	Beige	F	0	0	0	0	16	0	0
12/18/2014	15	14	Gun Range	XM - A	I	Cement Wall	S	Beige	F	0	0	0	0	2.4	0	0
12/18/2014	16	14	Gun Range	XM - B	I	Cement Floor	S	Red	F	0	563	198	6814	91	0.88	13.4
12/18/2014	17	14	Gun Range	XM - C	I	Cement Wall	S	Beige	F	0	0	0	0	1.1	0	0
12/18/2014	18	14	Gun Range	XM - C	I	Cement Block Wall	S	Beige	F	0	0	0	0	3.4	0	0
12/18/2014	19	14	Gun Range	XM - C	I	Cement Floor	S	Red	F	0	480	241	7701	83	0	61
12/18/2014	20	14	Gun Range	XM - C	I	Cement Floor	S	Grey	F	0	0	0	167	1.4	0	0
12/18/2014	21	14	Gun Range	XM - D	I	Cement Floor	S	Silver	F	0	0	0	171	4.7	0	0
12/18/2014	22	14	Gun Range	XM - D	I	Cement Floor	S	Black	F	0	0	0	0	3.6	0	0
12/18/2014	23	14	Gun Range	XM - D	I	Cement Floor	S	Yellow	F	0	0	51	153	18	0	0
12/18/2014	24	14	Gun Range	VOID	I	Base Board	S	Grey	F	0	0	0	133	0	0	0
12/18/2014	25	14	Gun Range	VOID	I	Base Board	S	Grey	F	0	0	0	430	0	0	0
12/18/2014	26	14	Gun Range	XM - F	I	Cement Block Wall	S	Beige	F	0	0	0	0	0	0	0

Date	Test #	Building #	Section & Floor	Location	Int (I) Ext (E)	Substrate	Rough (R) Smooth (S)	Color	Type Gloss (G) Flat (F)	As (ppm)	Ba (ppm)	Cd (ppm)	Cr (ppm)	Hg (ppm)	Se (ppm)	Ag (ppm)
12/18/2014	27	14	Gun Range	XM - F	I	Cement Block Wall	S	Yellow	F	0	0	41	207	0	0	0
12/18/2014	28	14	Gun Range	XM - F	I	Cement Floor	S	Grey	F	0	0	0	43	0	0	0
12/18/2014	29	14	Gun Range	XM - F	I	Cement Floor	S	Brown	F	0	0	0	0	0	0	0
12/18/2014	30	14	Gun Range	XM - F	I	Cement Block Wall	S	Beige	F	0	2.1	0	5	0	0	0
12/18/2014	31	14	Gun Range	XM - F	I	Cement Block Wall	S	Beige	F	0	1.1	0	5	0	0	0
12/18/2014	32	14	Gun Range	XM - F	I	Cement Block Wall	S	Beige	F	0	0	0	0	0	0	0
12/18/2014	33	14	Gun Range	XM - F	I	Cement Floor	S	Yellow	F	0	0	38	134	0	0	0
12/18/2014	34	14	Gun Range	XM - F	I	Cement Floor	S	Grey	F	0	0	0	377	0	0	0
1/7/2015	46	14		XQ - 37	I	Concrete Ceiling	S	Gray	F	0	0	0	99	0	0	0
1/7/2015	47	14		XQ - 37	I	Concrete Ceiling	S	Tan	F	0	0	0	0	0	0	0
1/7/2015	49	14		XQ - 36	I	Concrete Ceiling	S	Gray	F	0	67	0	213	0	0	0
1/7/2015	50	14		XQ - 37	I	Concrete Ceiling	S	White	F	0	3.8	0	472	0	0	0.18
1/7/2015	51	14		XQ - 36	I	Concrete Ceiling	S	White	F	0	4.4	0	248	0	0	0
1/7/2015	52	14		XM - 35	I	Concrete Ceiling	S	Off-White	F	0	88	0	411	0	0	0
1/7/2015	53	14		XM - 35	I	Concrete Ceiling	S	Off-White	F	6.7	49	0	483	0	0	0
1/7/2015	54	14		XO - 37	I	Concrete Ceiling	S	Tan	F	0	0	0	0	5.7	0	0
1/7/2015	55	14		XO - 37	I	Concrete Ceiling	S	Tan	F	0	0	0	0	8.8	0	0
1/7/2015	56	14		XO - 37	I	Concrete Ceiling	S	Tan	F	0	0	9.1	0	3.1	0	0
1/7/2015	57	14		XP - 35	I	Concrete Ceiling	S	Off-White	F	0	30	27	38	0	0	0.66
1/7/2015	58	14		XM - 39	I	Concrete Ceiling	S	Off-White	F	0	18.7	0	450	0	0	0
1/7/2015	59	14		XO - 39	I	Concrete Ceiling	S	Off-White	F	0	41	0	212	0	0	0
12/10/2014	185	16		A	I	Cement Block Wall	R	Tan	F	0	0	0	0	0	0	0
12/10/2014	186	16		A	I	Cement Block Wall	R	Off-White	F	0	0	0	402	0	0	0.76
12/10/2014	187	16		A	I	Cement Floor	S	Grey	F	0	0	0	4	0	0	0
12/10/2014	188	16		A	I	Cement Wall	S	Off-White	F	0	0	0	196	0	0	0
12/10/2014	189	16		A	I	Cement Wall	S	Tan	F	0	0	0	0	1.4	0	0
12/10/2014	190	16		B	I	Cement Block Wall	R	White	F	0	0	0	293	0	0	0
12/10/2014	191	16		B	I	Cement Wall	S	Tan	F	0	0	0	0	0.89	0	0
12/10/2014	192	16		A	I	Cement Wall	S	Off-White	F	0	0	0	66	0	0	0
12/10/2014	193	16		B	I	Cement Floor	S	Grey	F	0	0	0	465	0	0	0
12/10/2014	194	16		A	I	Cement Tank Bulkhead	S	Tan	F	0	0	0	0	3.7	0	0
12/10/2014	195	16		A	I	Cement Tank Bulkhead	S	Off-White	F	8	0	36	154	40	16	0
12/10/2014	196	16		E	I	Cement Block Wall	R	White	F	0	0	0	87	0	0	0
12/10/2014	197	16		C	I	Cement Wall	S	Mint Green	F	0	42	0	0	0	0	0
12/10/2014	198	16		D	I	Cement Floor	S	Light Grey	F	0	0	0	33	0	0	0
12/10/2014	199	16		E	I	Cement Floor	S	Grey	F	0	0	0	121	0	0	0
12/10/2014	200	16		E	I	Cement Block Wall	R	Off-White	F	0	0	0	370	0	0	0
12/10/2014	201	16		E	I	Cement Block Wall	R	White	F	0	0	0	306	0	0	0
12/10/2014	202	16		F	I	Cement Floor	S	Grey	F	0	0	3.3	243	0	0	0
4/20/2015	429	41		E10	I	Brick Wall	R	Off-White	F	0	37	0	69	0	0	0

Date	Test #	Building #	Section & Floor	Location	Int (I) Ext (E)	Substrate	Rough (R) Smooth (S)	Color	Type Gloss (G) Flat (F)	As (ppm)	Ba (ppm)	Cd (ppm)	Cr (ppm)	Hg (ppm)	Se (ppm)	Ag (ppm)
4/20/2015	430	41		E10	I	Concrete Column	S	Off-White	F	0	0	1.4	155	0	0	0
4/20/2015	431	41		D10	I	Cement Block Wall	R	Off-White	F	0	0	0	96	0	0	0
4/20/2015	432	41		C10	I	Cement Floor	S	Yellow	F	4.3	19.1	9.5	373	18.1	0	17.9
4/20/2015	433	41		A10	I	Cement Block Wall	R	White	F	0	0	0	320	0	0	0
4/20/2015	434	41		A8	I	Cement Block Wall	R	Off-White	F	0	0	0	131	0	0	3.2
4/20/2015	435	41		A6	I	Cement Block Wall	R	White	F	0	0	0	453	0	0	0
4/20/2015	436	41		C6	I	Cement Block Wall	R	Off-White	F	0	0	0	393	0	0	0
4/20/2015	437	41		C5	I	Cement Block Wall	R	Off-White	F	0	0	0	184	0	0	0
4/20/2015	438	41		A4	I	Cement Block Wall	R	Teal	F	0	0	11.8	0	47	0.8	0
4/20/2015	439	41		A4	I	Cement Block Wall	R	Baby Blue	F	0	0	0	0	0	0	0
4/20/2015	440	41		A4	I	Concrete Column	S	Baby Blue	F	0	550	0	0	0	0	0
4/20/2015	441	41		A4	I	Concrete Column	S	Hazel	F	0	417	0	0	0	0	0
4/20/2015	442	41		B4	I	Concrete Column	S	Green	F	0	8.8	0	0	0	0	0
4/20/2015	443	41		C4	I	Concrete Column	S	hazel	F	0	0	0	0	0	0	0
4/20/2015	444	41		A2	I	Cement Block Wall	R	Off-White	F	0	0	0	0	0	0	0
4/20/2015	445	41		A2	I	Cement Floor	S	Grey	F	0	0	0	298	0	0	0
4/20/2015	446	41		A2	I	Cement Floor	S	Black	F	0	0	0	0	0	0	0
4/20/2015	447	41		A2	I	Cement Block Wall	R	White	F	0	0	0	426	0	0	0
4/20/2015	448	41		C10	I	Cement Block Wall	R	Off-White	F	0	0	0	0	0	0	0
4/20/2015	449	41		C2	I	Cement Block Wall	R	Off-White	F	0	14.7	4.2	0	0	0.24	0
4/20/2015	450	41		F2	I	Cement Block Wall	R	Off-White	F	0	19.3	0	0	0	0	0
4/20/2015	451	41		E3	I	Cement Block Wall	R	Light Grey	F	0	0	19.8	271	0	0	0
4/20/2015	452	41		E4	I	Cement Block Wall	R	Light Grey	F	0	0	11.7	453	0	0	0
4/20/2015	453	41		C3	I	Cement Block Wall	R	Off-White	F	0	0	0	0	0	0	0
4/20/2015	454	41		D4	I	Concrete Column	S	Blue	F	0	0	0	0	0	0	0
4/20/2015	455	41		F4	I	Concrete Column	S	Light Grey	F	0	0	13	277	4.8	0	0
4/20/2015	456	41		F5	I	Cement Block Wall	R	Off-White	F	0	0	0	0	0	0	0
4/20/2015	457	41		F7	I	Cement Block Wall	R	Tan	F	0	0	0	0	0	0	0
4/20/2015	458	41		C8	I	Cement Block Wall	R	Off-White	F	0	0	0	0	0	0	0
4/20/2015	459	41		D7	I	Cement Block Wall	R	Off-White	F	0	0	0	0	0	0	0
4/20/2015	460	41		E8	I	Cement Floor	S	Blue	F	0	0	0	452	0	0	0
4/20/2015	461	41		D7	I	Cement Block Wall	R	White	F	0	6.6	0	454	0	0	0
4/20/2015	462	41		D7	I	Cement Floor	S	Grey	F	0	0	0	90	0	0	0
4/20/2015	463	41		E9	I	Concrete Ceiling	S	White	F	0	0	0.95	441	0	0	0
4/20/2015	464	41		B9	I	Concrete Ceiling	S	White	F	0	0	0	314	0	0	0
4/20/2015	465	41		B6	I	Concrete Ceiling	S	White	F	0	0	0	121	0	0	0
4/20/2015	466	41		E5	I	Concrete Ceiling	S	White	F	0	0	1.4	416	0	0	0
4/20/2015	467	41		E4	I	Concrete Ceiling	S	White	F	0	0	1.7	6	0	0	0
4/20/2015	468	41		B2	I	Concrete Ceiling	S	White	F	0	0	0	318	0	0	0
4/20/2015	469	41		E1	I	Concrete Ceiling	S	White	F	0	0	0	271	0	0	0

Date	Test #	Building #	Section & Floor	Location	Int (I) Ext (E)	Substrate	Rough (R) Smooth (S)	Color	Type Gloss (G) Flat (F)	As (ppm)	Ba (ppm)	Cd (ppm)	Cr (ppm)	Hg (ppm)	Se (ppm)	Ag (ppm)
4/20/2015	470	41		E7	I	Concrete Ceiling	S	White	F	0	0	2.1	176	0	0	0
4/20/2015	471	41		B7	I	Concrete Ceiling	S	White	F	0	0	0	25	0	0	0
4/20/2015	472	42		B5	I	Cement Block Wall	R	White	F	0	0	0	227	0	0	0.36
4/20/2015	473	42		B7	I	Cement Block Wall	R	Grey	F	0	0	0	177	0	0	0
4/20/2015	474	42		B8	I	Concrete Wall	S	Grey	F	0	0	0	316	0	0.67	0
4/20/2015	475	42		B4	I	Concrete Tank	S	White	F	0	817	4.9	477	0	0.99	0.8
4/20/2015	476	42		B5	I	Concrete Tank	S	Grey	F	0	1937	0	219	0	0.4	0
4/20/2015	477	42		C4	I	Cement Floor	S	White	F	0	0	0	277	0	0	0
4/20/2015	478	42		C5	I	Cement Block Wall	R	Off-White	F	0	0	0	205	0	0	0
4/20/2015	479	42		C7	I	Cement Floor	S	Yellow	F	0	0	0	441	0	0	0
4/20/2015	480	42		C6	I	Brick Wall	R	Grey	F	0	0	0	120	0	0	0.95
4/20/2015	481	42		C5	I	Brick Wall	R	White	F	0	0	0	72	0	0	0
12/10/2014	219	46		XA	I	Cement Floor	S	Grey	F	0	0	0	276	0	0	0
12/10/2014	220	46		XC	I	Cement Floor	S	Grey	F	0	0	0	35	0	0	0
12/10/2014	221	46		XC	I	Cement Floor	S	Grey	F	0	0	0	337	0	0	0
12/10/2014	222	46		XE	I	Cement Wall	S	White	F	0	0	0	257	1.4	0	0
12/10/2014	223	48		M1	I	Cement Block Wall	R	Tan	F	0	0	0	0	0	0	0
12/10/2014	224	48		M1	I	Cement Floor	S	Light Grey	F	0	1.2	0	476	0	0	0
12/10/2014	225	48		I1	I	Cement Barrier	S	Yellow	F	0	0	0	0	0	0	0
12/10/2014	226	48		H1	I	Cement Floor	S	Light Grey	F	0	3.8	0	244	0	0	0
12/10/2014	227	48		G1	I	Cement Floor	S	Grey	F	0	19.7	0	449	0	0	0
12/10/2014	228	48		D1	I	Cement Block Wall	R	Tan	F	0	0	0	0	1.1	0	0
12/10/2014	229	48		D1	I	Cement Slab	S	Light Brown	F	0	0	6.7	0	0	0	0
12/10/2014	230	48		D1	I	Cement Floor	S	Grey	F	0	0	0	331	0	2.8	0
12/10/2014	231	48		D1	I	Cement Block Wall	R	Tan	F	0	0	0	0	0	0	0
12/10/2014	232	48		A5	I	Cement Block Wall	R	Tan	F	0	0	0	0	0	0	0
12/10/2014	234	48		B5	I	Cement Floor	S	Grey	F	0	0	0	467	0	0	0
12/10/2014	235	48		B5	I	Cement Wall	S	Tan	F	0	0	0	0	0	0	0
12/10/2014	236	48		C5	I	Cement Block Wall	R	Tan	F	16.7	0	0	0	0	0	0
12/10/2014	237	48		C5	I	Cement Floor	S	Grey	F	0	2.2	0	217	0	0	0
12/10/2014	238	48		C5	I	Cement Ceiling	S	Blue	F	0	0	0	320	0	0	0
12/10/2014	239	48		D2	I	Cement Block Wall	R	White	F	0	0	0	405	0	0	0
12/10/2014	240	48		B3	I	Cement Floor	S	Grey	F	0	0	0	303	0	0	0
12/10/2014	241	48		G 2.5	I	Cement Floor	S	Grey	F	0	0	0	86	0	0	0
12/10/2014	242	48		G2	I	Cement Block Wall	R	Tan	F	0	0	0	0	0	0	0
12/10/2014	243	48		I 2.5	I	Cement Floor	S	Light Grey	F	0	0	3.8	325	0	0	0
12/10/2014	244	48		I 3.5	I	Cement Wall	S	Tan	F	0	0	0	0	0	0	0
12/10/2014	245	48		I 3	I	Cement Floor	S	Light Grey	F	0	0	6.1	178	0	0	0
12/10/2014	246	48		I 4	I	Cement Block Wall	R	Tan	F	0	0	0	0	0	0	0
12/12/2014	419	49		A	I	Cement Floor	S	Grey	F	0	0	0	141	0	0	0

Date	Test #	Building #	Section & Floor	Location	Int (I) Ext (E)	Substrate	Rough (R) Smooth (S)	Color	Type Gloss (G) Flat (F)	As (ppm)	Ba (ppm)	Cd (ppm)	Cr (ppm)	Hg (ppm)	Se (ppm)	Ag (ppm)
12/12/2014	420	49		A	I	Cement Block Wall	R	Tan	F	0	0	0	0	0	0	0
12/12/2014	421	49		A	I	Cement Floor	S	Yellow	F	0	8.8	37	258	0	0	0
12/12/2014	422	49		A	I	Cement Floor	S	Grey	F	0	0	0	123	0	0	0
12/12/2014	423	49		A	I	Cement Block	S	Grey	F	0	0	0	468	0	0	0
12/12/2014	424	49		A	I	Cement Wall	S	Tan	F	0	0	0	0	0	0	0
12/12/2014	425	49		A	I	Cement Block Wall	R	Tan	F	0	0	0	0	0	0	0
12/12/2014	426	49		A	I	Cement Wall	S	Tan	F	0	0	0	0	0	0	0
12/12/2014	427	49		A	I	Cement Block	S	Dark Grey	F	0	0	0	367	0	0	0
12/12/2014	Rd 418	49		A	I	Cement Wall	S	Tan	F	0	0	0	0	0	0	0
4/21/2015	496	50		D3	I	Concrete Wall	S	Black	F	0	0	0	0	0	0	0
4/21/2015	497	50		C3	I	Cement Floor	S	Grey	F	0	0	0	28	0	0	0
4/21/2015	498	50		D3	I	Concrete Wall	S	Off-White	F	0	90	0	276	0	0	0
4/21/2015	499	50		D3	I	Concrete Wall	S	Off-White	F	0	67	0	439	0	0	0
4/21/2015	500	50		B3	I	Concrete Wall	S	Grey	F	0	13.1	0	420	0	0.03	0.9
4/21/2015	501	50		B3	I	Concrete Wall	S	Black	F	0	8.9	0	0	0	0	0
4/21/2015	502	50		A2	I	Concrete Wall	S	Grey	F	0	16.3	0	0	0	0	0
4/21/2015	503	50		A2	I	Concrete Wall	S	White	F	0	8.9	0	0	0	0	0
4/21/2015	504	50		A1	I	Concrete Wall	S	White	F	0	14.5	0	0	0	0	0
4/21/2015	505	50		A1	I	Concrete Wall	S	Grey	F	4	2.6	0	262	0	0	0
4/21/2015	506	50		C1	I	Concrete Wall	S	Grey	F	0	3	0	121	0	0	0
4/21/2015	507	50		C1	I	Concrete Wall	S	White	F	0	0	0	226	0	0	0
4/21/2015	508	50		D2	I	Cement Floor	S	Black	F	0	0	0	0	0	0	0
4/21/2015	509	50		B2	I	Concrete Ceiling	R S	Tan	F	0	0	0	0	0	0	0
12/8/2014	11	54	1st	LF - 8	I	Cinder Block Wall	R	Off-White	G	0	11	0	413	0	0	0
12/8/2014	12	54	1st	LA 3/4 - 8	I	Brick Wall	R	Off-White	F	0	14.1	0	80	0	0	0
12/8/2014	13	54	1st	LA - 7	I	Cement Block Wall	R	Taupe	G	0	0	6.6	0	0	0.1	0
12/8/2014	14	54	1st	LA 1/4 - 6	I	Cement Wall	R	Taupe	G	0	0	13.2	0	0	0	0
12/8/2014	15	54	1st	LF - 7	I	Cement Wall	R	Off-White	G	0	0	0	256	0	0	0
12/8/2014	16	54	1st	LA 3/4 - 6	I	Cement Wall	R	Off-White	G	0	0	0	477	0	0	0
12/8/2014	17	54	1st	LA - 6	I	Cement Block Wall	R	Tan	G	0	0	6.9	0	0	0.89	0.01
12/8/2014	18	54	1st	LA 3/4 - 5 3/4	I	Cement Wall	R	Tan	G	0	0	0	0	0	0	0
12/8/2014	19	54	1st	LA 1/2 - 5	I	Cement Wall	R	Tan	G	0	0	0	0	0	0	0
12/8/2014	20	54	1st	LA - 5	I	Cement Block Wall	R	Off-White	G	0	6.8	0	230	0	0	0.02
12/8/2014	21	54	1st	LA 1/2 - 4 1/2	I	Cement Wall	R	Light Tan	G	0	0	7.1	0	6.8	0	0
12/8/2014	22	54	1st	LA - 4	I	Cement Block Wall	R	Light Tan	G	0	0	4.9	0	3	0	0
12/8/2014	23	54	1st	LA - 3	I	Cement Wall	R	Light Tan	G	0	0	3.5	0	2.7	0	0
12/8/2014	24	54	1st	LA - 2	I	Cement Block Wall	R	Tan	G	0	0	9.1	0	19	0	0
12/8/2014	25	54	1st	LA 1/4 - 2	I	Cement Block Wall	R	Light Tan	G	0	0	6.6	0	14.3	0	0
12/8/2014	26	54	1st	LF - 2	I	Cement Wall	R	Tan	G	0	8.3	0	0	4.4	0	0
12/8/2014	27	54	1st	LA 3/4 - 2	I	Cement Wall	R	Light Tan	G	0	0	1.1	0	0	0	0

Date	Test #	Building #	Section & Floor	Location	Int (I) Ext (E)	Substrate	Rough (R) Smooth (S)	Color	Type Gloss (G) Flat (F)	As (ppm)	Ba (ppm)	Cd (ppm)	Cr (ppm)	Hg (ppm)	Se (ppm)	Ag (ppm)
12/8/2014	28	54	1st	LF - 1	I	Cement Wall	R	Off-White	G	0	0	0	0	0	0	0
12/8/2014	29	54	1st	LF - 2	I	Cement Block Wall	R	Off-White	G	0	0	0	0	0	0	0
12/8/2014	30	54	1st	LF - 1/4 - 2	I	Cement Block Wall	R	Off-White	G	0	0	0	0	0	0	0
12/8/2014	31	54	1st	LF 3/4 - 2	I	Cement Block Wall	R	Off-White	G	0	0	0	0	0	0	0
12/8/2014	32	54	1st	LL - 3	I	Cement Block Wall	R	White	G	0	0	0	281	0	0	0.47
12/8/2014	33	54	1st	LF 3/4 - 3	I	Cement Block Wall	R	White	G	0	0	0	118	0	0	0
12/8/2014	34	54	1st	LL - 1	I	Cement Block Wall	R	White	G	0	0	0	330	0	0	0
12/8/2014	35	54	1st	LL - 2	I	Cement Block Wall	R	White	G	0	0	0	329	0	0	0
12/8/2014	36	54	1st	LO - 4	I	Cement Block Wall	R	Grey	G	0.01	0	0	317	0	0	0
12/8/2014	37	54	1st	LL 3/4 - 1	I	Brick Wall	R	Grey	F	0	9.4	0	139	0	0	0
12/8/2014	38	54	1st	LL 1/2 - 2	I	Cement Wall	R	Grey	G	0	3.3	0	474	0	0	0
12/8/2014	39	54	1st	LL 3/4 - 4	I	Cement Block Wall	R	Grey	G	0	14.9	0	167	0	0	0
12/8/2014	40	54	1st	LL 1/4 - 4	I	Cement Wall	R	White	G	0	0	0	211	0	0	0
12/8/2014	41	54	1st	LL 1/2 - 4	I	Cement Block Wall	R	White	G	0	2.7	0	169	0	0	0
12/8/2014	42	54	1st	LL - 3 1/2	I	Cement Block Wall	R	White	G	0	0	0	188	0	0	0
12/8/2014	43	54	1st	LL - 5	I	Cement Block Wall	R	Black	G	0	66	0	0	0	0	0
12/8/2014	44	54	1st	LF 1/4 - 5	I	Cement Block Wall	R	Black	G	0	43	0	0	0	0	0
12/8/2014	45	54	1st	LF 1/2 - 8	I	Brick Wall	R	Grey	F	0	0	0	274	0	0	0
12/8/2014	46	54		LF 1/4 - 8	I	Brick Wall	R	White	F	0	0	0	1	0	0	0
12/8/2014	47	54		LL 1/5 - 8	I	Cement Block Wall	R	Grey	G	0	0	0	180	0	0	0
12/8/2014	48	54		LL - 8	I	Cement Block Wall	R	White	G	0	0	0	466	0	0	0
12/8/2014	49	54		LF 1/2 - 7 1/2	I	Cement Block Wall	R	Black	G	0	0	0	0	0	0	0
12/8/2014	50	54		LL - 7 1/2	I	Cement Block Wall	R	Tan	G	0	0	5.3	0	0	0	0
12/8/2014	51	54		LF 1/2 - 6	I	Cement Block Wall	R	Tan	G	0.7	0	2.9	0	0	0	0
12/8/2014	52	54		LF 1/4 - 6	I	Cement Block Wall	R	Tan	G	0	0	4	0	0	0	0
12/8/2014	53	54		LF 1/2 -4	I	Cement Block Wall	R	Tan	G	0	0	1.1	0	0	0	0
12/8/2014	54	54		2nd Floor - Northwest Room 1	I	Cement Wall	R	Tan	G	0	0	3.7	0	0	0	0
12/8/2014	55	54		2nd Floor - Northwest Room 1	I	Cement Block Wall	R	Tan	G	0	0	6.9	0	0	0	0
12/8/2014	56	54		2nd Floor - Southeast Room 1	I	Cement Block Wall	R	Tan	G	0	0	2.1	0	0	0	0
12/8/2014	57	54		2nd Floor - Southeast Room 2	I	Cement Wall	R	White	G	0	0	0	184	4.4	0	0
12/8/2014	58	54		2nd Floor - Northeast Room 2	I	Cement Block Wall	R	White	G	0	0	0	441	6.9	0	0
12/8/2014	59	54		2nd Floor - West Room 2	I	Cement Block Wall	R	White	G	0	0	0	0	3.8	0.99	0.63
12/8/2014	60	54		Hallway	I	Cement Block Wall	R	Tan	G	0	0	7.4	0	0	0	0
12/8/2014	61	54		South Room 3	I	Cement Wall	R	Tan	G	0	0	3.1	0	0	0	0
12/8/2014	62	54		West Room 4	I	Cement Block Wall	R	Tan	G	0	0	2.8	0	0	0	0
12/8/2014	63	54		Stairs Exit	I	Cement Block Wall	R	Tan	G	0	0	6.3	0	0	0	0
12/8/2014	145	54		LA 1/4 - 5	I	Cement Wall	R	Blue	G	0	0	0	0	0	0	0
12/8/2014	146	54		LA 1/4 - 6	I	Cement Wall	R	Blue	G	0	0	0	0	0	0	0
12/8/2014	147	54		LL - 3	I	Cement Wall	R	Blue	G	0.3	0	0	0	0	0	0
12/8/2014	148	54		LF 3/4 -5	I	Cement Wall	R	Maroon	G	0	0	36	0	0	0	0

Date	Test #	Building #	Section & Floor	Location	Int (I) Ext (E)	Substrate	Rough (R) Smooth (S)	Color	Type Gloss (G) Flat (F)	As (ppm)	Ba (ppm)	Cd (ppm)	Cr (ppm)	Hg (ppm)	Se (ppm)	Ag (ppm)
12/8/2014	149	54		LL - 3	I	Cement Wall	R	Blue	G	0	0	0	0	0	0	0
12/8/2014	150	54		LL 1/5 - 4	I	Cement Wall	R	Grey	G	0	0	0	0	0	0	0
12/8/2014	151	54		LL 1/2 - 2	I	Cement Wall	R	Maroon	G	0	0	29	0	0	0	0
12/8/2014	152	54		LL - 4	I	Cement Wall	R	Blue	G	0	0	0	0	0	0	0
12/8/2014	153	54		LL 1/5 - 4	I	Cement Wall	R	Grey	G	0	0	0	0	0	0	0
12/8/2014	154	54		LF - 6	I	Cement Wall	R	Blue	G	0	0	0	0	0	0	0
12/8/2014	155	54		LF - 8	I	Cement Wall	R	Blue	G	0	0	0	0	0	0	0
12/8/2014	156	54		LF 1	I	Cement Wall	R	Blue	G	0	0	0	0	0	0	0
12/8/2014	157	54		Basement	I	Cement Wall	R	Blue	G	0	0	0	0	0	0	0
12/8/2014	158	54		Basement	I	Cement Wall	R	White	G	0	0	0	0	1.1	0	0
1/7/2015	40	54		LF - 3	I	Concrete Ceiling	S	White	F	0	4.6	0	0	6.9	0	0
1/7/2015	41	54		LF - 3	I	Concrete Ceiling	S	White	F	0	9.3	0	0	3.4	0	0
1/7/2015	42	54		LL - 3	I	Concrete Ceiling	S	White	F	0	0	0	0	5	0	0
1/7/2015	43	54		LJ - 5	I	Concrete Ceiling	S	White	F	0	0.67	0	0	8.8	0	0
1/7/2015	44	54		LL - 4	I	Concrete Ceiling	S	White	F	0	2.4	0	0	17.9	0	0
1/7/2015	45	54		LE - 7	I	Concrete Ceiling	R	White	F	0	0	0	0	9.4	0	0
12/17/2014	33	59		A5	I	Cement Floor	S	Grey	F	0	0	0	0	0	0	0
12/17/2014	34	59		A6	I	Cement Block Wall	R	Beige	F	0	0	4.2	0	0	0	0.3
12/17/2014	35	59		A5	I	Cement Block Wall	R	Beige	F	0	0	1.3	0	0	0	0
12/17/2014	36	59		A4	I	Cement Block Wall Top	R	Tan	F	0	0	0	0	0	0	0
12/17/2014	37	59		A4	I	Cement Block Wall Bottom	R	Beige	F	0	0	1.7	0	0	0	0
12/17/2014	38	59		B5	I	Cement Floor	S	Grey	F	0	0	0	0	0	0	0
12/17/2014	39	59		B5	I	Cement Block Wall	R	Beige	F	0	0	0	0	0	0	0
12/17/2014	40	59		A7	I	Cement Floor	S	Grey	F	0	0	0	0	0	0	0
12/17/2014	41	59		A7	I	Cement Block Wall	R	Beige	F	0	0	0	0	0	0	0
12/17/2014	42	59		B7	I	Cement Floor	S	Grey	F	0	0	0	0	0	0	0
12/17/2014	43	59		B6	I	Cement Block Wall	R	Beige	F	0	0	0	0	0	0	0
12/17/2014	44	59		A8	I	Cement Block Wall	R	Beige	F	0	0	0	0	0	0	0
12/17/2014	45	59		B9	I	Cement Block Wall	R	Beige	F	0	0	0	0	0	0	0
12/17/2014	46	59		A8	I	Concrete Partition	S	Dark Grey	F	0	0	0	278	0	0	0
12/17/2014	47	59		A9	I	Cement Floor	S	Grey	F	0	0	0	0	0	0	0
12/17/2014	48	59		A9	I	Cement Block Wall	S	Yellow	F	0	97	38	85	0	0	0
12/17/2014	49	59		B9	I	Cement Block Wall	R	Beige	F	0	0	0	0	0	0	0
12/17/2014	50	59		B10	I	Cement Floor	S	Grey	F	0	0	4.2	169	0	0	0
12/17/2014	51	59		B10	I	Cement Floor	S	Grey	F	0	0	6.1	288	0	0	0
12/17/2014	52	59		C11	I	Cement Wall	S	Beige	F	0	0	0	0	0	0	0
12/17/2014	53	59		B10	I	Cement Block Wall	R	Beige	F	0	0	0	0	0	0	0
12/17/2014	54	59		A10	I	Cement Block Wall	R	Beige	F	0	0	0	0	0	0	0
12/17/2014	55	59		C11	I	Cement Floor	S	Grey	F	0	67	1.4	150	0	0	0
12/17/2014	56	59		B12	I	Cement Wall	S	Beige	F	0	0	0	0	0	0	0

Date	Test #	Building #	Section & Floor	Location	Int (I) Ext (E)	Substrate	Rough (R) Smooth (S)	Color	Type Gloss (G) Flat (F)	As (ppm)	Ba (ppm)	Cd (ppm)	Cr (ppm)	Hg (ppm)	Se (ppm)	Ag (ppm)
12/17/2014	57	59		B13	I	Cement Wall	S	Dark Grey	F	0	33	0	0	0	0	0
12/17/2014	58	59		A12	I	Cement Floor	S	Tan	F	0	0	0	0	6.2	0	0
12/17/2014	59	59		B14	I	Cement Floor	S	Grey	F	0	0	2.1	7	0	0	0
12/17/2014	60	59		A13	I	Cement Floor	S	Grey	F	0	0	6	188	0	0	0
12/17/2014	61	59		B15	I	Cement Wall	S	Grey	F	0	50	5.9	281	0	0	0
12/17/2014	62	59		A13	I	Cement Floor	S	Grey	F	0	0	3.7	440	0	0	0
12/17/2014	63	59		A14	I	Cement Floor	S	Tan	F	0	0	1.1	0	4.8	0.2	0
12/17/2014	64	59		A14	I	Cement Floor	S	Grey	F	0	0	9.4	425	0	0	0
12/17/2014	65	59		B13	I	Cement Floor	S	Grey	F	0	0	10.7	42	0	0	0
12/17/2014	66	59		A15	I	Cement Floor	S	Grey	F	0	0	18.3	210	0	0	0
12/17/2014	67	59		A16	I	Cement Block Wall	R	Beige	F	0	0	0	0	0	0	0
12/17/2014	68	59		B17	I	Cement Floor	S	Grey	F	0	0	14.6	381	0	0	0
12/17/2014	69	59		A16	I	Cement Floor	S	Tan	F	0	0	0	0	0	0	0
12/17/2014	70	59		B16	I	Cement Floor	S	Grey	F	0	0	3.9	233	0	0	0
12/17/2014	71	59		B15	I	Cement Block Wall	R	Beige	F	0	0	0	0	0	0	0
12/17/2014	72	59		A10	I	Cement Block Wall (upstairs0	R	White	F	0.22	0	0	0	0	0	0
12/17/2014	73	59		A11	I	Cement Floor (upstairs)	S	Grey	F	0	0	0	679	0	0	0
12/17/2014	74	59		A13	I	Cement Block Wall (upstairs)	R	Tan	F	0	0	0	0	0	0	0
12/10/2014	215	77		AA	I	Cement Block Wall	R	White	F	0	0	6.9	0	0	0	0
12/10/2014	216	77		AA	I	Cement Floor	S	Grey	F	0	0	0	327	0	0	0
12/10/2014	217	77		AA	I	Cement Floor	S	Grey	F	0	0	0	550	0	0	0
12/10/2014	218	77		AA	I	Cement Block Wall	R	White	F	0	0	0	388	0	0	0
1/9/2015	32	86		XE - 43 3/4	I	Cement Floor	S	Light Blue	F	0	44	14.2	223	9.9	0.55	0
1/9/2015	33	86		XE - 43 1/2	I	Concrete Wall	S	White	G	0	0	0	697	0	0	0
1/9/2015	34	86		XDA - 43 3/4	I	Cement Block Wall	R	White	G	0	0	0	265	0	0	0
1/9/2015	35	86		XH - 43 3/4	I	Cement Block Wall	R	White	G	0	0	0	494	0	0	0
1/9/2015	36	86		XG - 43 3/4	I	Cement Floor	S	Light Blue	F	0	72	13.7	236	8.3	0	0
1/9/2015	37	86		XG - 43	I	Concrete Wall	S	White	F	0	0	0	312	0	0	0
1/9/2015	38	86		XG - 43	I	Cement Floor	S	Light Blue	F	0	30	0	259	0	0	0
1/9/2015	39	86		XF - 43	I	Concrete Wall	S	White	F	0	0	0	415	0	0	0
1/9/2015	40	86		XE - 42 1/2	I	Cement Floor	S	Light Blue	F	0	69	37	323	17.1	0	0
1/9/2015	41	86		XE - 43 1/2	I	Concrete Wall	S	White	G	0	0	0	303	0	0	0
1/9/2015	42	86		XF - 43	I	Concrete Wall	S	White	F	0	0	0	411	0	0	0
1/9/2015	43	86		XF - 43 1/2	I	Cement Floor	S	Light Blue	F	0	20	24	536	15.1	0	0
1/9/2015	44	86		XE - 43 3/4	I	Concrete Wall	S	White	G	0	0	0	202	0	0	0
1/9/2015	45	86		XE - 43	I	Concrete Wall	S	White	F	0	0	0	513	0	0	0
1/9/2015	46	86		XDA - 43 3/4	I	Concrete Wall	S	White	F	0	0	0	344	0	0	0
1/9/2015	47	86		XDA 1/2 - 43	I	Cement Floor	S	Light Blue	F	0	107	41	460	15.8	0	0
1/9/2015	48	86		XDA 1/2 - 43 1/2	I	Cement Block Wall	R	White	F	0	0	0	226	0	0	0
1/9/2015	49	86		XDA - 42	I	Concrete Wall	S	White	G	0	0	0	649	0	0	0

Date	Test #	Building #	Section & Floor	Location	Int (I) Ext (E)	Substrate	Rough (R) Smooth (S)	Color	Type Gloss (G) Flat (F)	As (ppm)	Ba (ppm)	Cd (ppm)	Cr (ppm)	Hg (ppm)	Se (ppm)	Ag (ppm)
1/9/2015	50	86		XE - 42	I	Concrete Wall	S	White	F	0	0	0	283	0	0	0
1/9/2015	51	86		XDA 1/2 - 42	I	Cement Floor	S	Light Blue	F	0	91	28	538	11.9	0	0
1/9/2015	52	86		XE 1/2 - 42	I	Cement Floor	S	Light Blue	F	0	64	33	204	27	0	0
1/9/2015	53	86		XE - 42	I	Concrete Wall	S	White	F	0	0	0	699	0	0	0
1/9/2015	54	86		XF - 42	I	Concrete Wall	S	White	F	0	0	0	589	0	0	0
1/9/2015	55	86		XG - 42	I	Concrete Wall	S	White	F	0	0	0	255	0	0	0
1/9/2015	56	86		XF - 42	I	Concrete Wall	S	White	F	0	0	0	239	0	0	0
1/9/2015	57	86		XF 1/2 - 42	I	Cement Floor	S	Light Blue	F	0	8.4	29	302	24.6	0	0
1/9/2015	58	86		XG - 41 1/2	I	Cement Block Wall	R	White	F	0	0	0	538	0	0	0
1/9/2015	59	86		XF - 40 1/4	I	Cement Block Wall	R	White	F	0	0	0	676	0	0	0
1/9/2015	60	86		XE 1/2 - 41 3/4	I	Concrete Wall	S	White	F	0	0	0	487	0	1.72	0.81
1/9/2015	61	86		XE - 40 1/4	I	Cement Block Wall	R	White	F	0	0	0	243	0	0	0
1/9/2015	62	86		XE - 41	I	Cement Floor	S	Light Blue	F	0	66	39	617	27.1	0	0
1/9/2015	63	86		XF - 41	I	Cement Floor	S	Light Blue	F	0	147	18.3	660	19.9	0	0
1/9/2015	64	86		XDA - 40 1/2	I	Cement Floor	S	Light Blue	F	0	119	33	226	31.4	0	0
1/9/2015	65	86		XDA - 40 1/2	I	Brick Wall	R	White	F	0	0	0	50	0	0	0
1/9/2015	66	86		XDA - 40 1/2	I	Cement Block Wall	R	White	F	0	0	0	297	0	0	0
1/9/2015	67	86		XDA - 42	I	Concrete Wall	S	White	F	0	0	1.3	206	0	0	0
1/9/2015	68	86		Hall XDA - 41 3/4	I	Cement Floor	S	Light Blue	F	0	100	27	183	15.7	0	0
1/9/2015	69	86		Hall XDA - 43 1/2	I	Cement Floor	S	Light Blue	F	0	126	31	285	28.1	0	0
1/9/2015	70	86		XAO - 42 3/4	I	Brick Wall	R	White	F	0	0	0	46	0	0	0
1/9/2015	71	86		XAO - 42 3/4	I	Cement Floor	S	Light Blue	F	0	88	0	74	0	0	0
1/9/2015	72	86		AA - 43 1/4	I	Cement Block Wall	R	White	F	0	0	0	1	0	0	0
1/9/2015	73	86		AA - 43 3/4	I	Cement Block Wall	R	White	G	0	0	0	47	0	0	0
1/9/2015	74	86		BC - 44 1/2	I	Brick Wall	R	White	F	0	0	0	176	0	0	0
1/9/2015	75	86		BC - 44	I	Cement Floor	S	Light Blue	F	0	60	22	163	29.7	0	0
1/9/2015	76	86		AA 1/2 - 43	I	Cement Floor	S	Light Blue	F	0	3.5	26	79	18.8	0	0
1/9/2015	77	86		BC - 43	I	Cement Floor	S	Light Blue	F	0	1.6	15.9	30	30.6	0	0
1/9/2015	78	86		XAO 1/2 - 43 1/2	I	Cement Floor	S	Light Blue	F	0	74	13.2	86	17.7	0	0
1/9/2015	79	86		XD - 43	I	Brick Wall	R	White	G	0	0	0	174	0	0	0
1/9/2015	80	86		BC 1/2 - 43 1/4	I	Cement Floor	S	Light Blue	F	0	40	19.1	236	29.4	0	0
1/9/2015	81	86		XAO 1/2 - 44 1/4	I	Brick Wall	R	White	F	0	0	0	152	0	0	0
1/9/2015	82	86		XDA - 43	I	Concrete Wall	S	White	F	0	0	0	135	0	0	0
1/9/2015	83	86		XAO 1/2 - 41 3/4	I	Brick Wall	R	Off-White	F	0	0	0	0	0	0	0
1/9/2015	84	86		AA - 41 3/4	I	Cement Block Wall	R	Off-White	F	0	0	0	0	0	0	0
1/9/2015	85	86		BC 1/2 - 41	I	Cement Floor	S	Light Blue	F	0	38	0	3	20.1	0	0
1/9/2015	86	86		BC 1/2 - 42 1/2	I	Cement Floor	S	Light Blue	F	0	22	0	0	32	0	0
1/9/2015	90	86		XCD - 43 1/2	I	Concrete Ceiling	S	White	F	0	0	0	219	0	0.62	0.44
1/9/2015	91	86		XF -42 1/2	I	Concrete Ceiling	S	White	F	0.01	0	0	124	0	0	3.8
1/9/2015	92	86		Hall XDA - 41 1/2	I	Concrete Ceiling	S	White	F	0	0	0	40	0	0	0

Date	Test #	Building #	Section & Floor	Location	Int (I) Ext (E)	Substrate	Rough (R) Smooth (S)	Color	Type Gloss (G) Flat (F)	As (ppm)	Ba (ppm)	Cd (ppm)	Cr (ppm)	Hg (ppm)	Se (ppm)	Ag (ppm)
1/9/2015	93	86		BC - 42 1/2	I	Concrete Ceiling	S	White	F	0	0	0	15	0	0	0.9
1/9/2015	94	86		XAC - 41	I	Concrete Ceiling	S	White	F	0	0	0	177	0	0	0
1/9/2015	(1/9) 31	86		XE - 44 1/2	I	Brick Wall	R	White	G	0	0	0	131	0	0	0
12/16/2014	1	87		XJ - 45 1/2	I	Cement Wall	R	Grey	F	0	0	0	87	0	0	0
12/16/2014	2	87		XJ - 45 1/2	I	Cement Floor	R	Grey	F	0	0	0	171	0	0	0
12/16/2014	3	87		XJ - 45 1/2	I	Cement Stairs	R	Brown	F	0	0	0	0	0	0	0
12/16/2014	4	87		XJ - 46 1/2	I	Cement Floor	R	Yellow	F	0	0	0	669	0	0	0
12/16/2014	5	87		XJ - 46 1/2	I	Cement Wall	R	Tan	F	0	0	2.4	0	0	0	0
12/16/2014	6	87		XJ - 47 1/2	I	Cement Wall	R	Light Grey	F	0	879	0	185	0	0	0
12/16/2014	7	87		XJ - 47 1/2	I	Cement Wall	R	Tan	F	0	0	1.9	0	0	0	0
12/16/2014	8	87		XL - 47 1/2	I	Cement Wall	R	Beige	F	0	0	0	0	0	0	0
12/16/2014	9	87		XJ - 47 1/2	I	Cement Wall	R	Tan	F	0	0	0	0	0	0	0
12/16/2014	10	87		XL - 45 1/2	I	Cement Wall	R	Tan	F	0	0	0	0	0	0	0
12/16/2014	11	87		XL - 46 1/2	I	Cement Wall	R	Tan	F	0	0	1.2	0	1.4	0	0
12/16/2014	12	87		XL - 46 1/2	I	Cement Block Wall	R	Tan	F	0	0	0	0	0	0	0
12/16/2014	13	87		XL - 46 1/2	I	Cement Wall	R	Grey	F	0	0	0	173	2.8	1.5	8.4
12/16/2014	14	87		XL - 46 1/2	I	Cement Wall	R	Tan	F	0	0	0	0	6.1	0	0
12/16/2014	15	87		XL - 46 1/2	I	Cement Block Wall	R	Tan	F	0	0	0	0	0	0	0
12/16/2014	16	87		XL - 47 1/2	I	Cement Floor	R	Dark Grey	F	0	0	0	0	0	0	0
12/16/2014	17	87		XN - 47	I	Cement Floor	R	Grey	F	0	0	0	49	0	0	0
12/16/2014	18	87		XN - 46	I	Cement Wall	R	Tan	F	0	0	0	0	0	0	0
12/16/2014	19	87		XN - 45 1/2	I	Cement Wall	R	Tan	F	0	0	0	0	0	0	0
12/16/2014	20	87		XN - 45 1/2	I	Cement Wall	R	Tan	F	0	0	0	0	0	0	0
12/16/2014	21	87		XN - 45 1/2	I	Cement Floor	R	Brown	F	0	0	6.7	0	0	0	0
12/16/2014	22	87		XN - 45 1/2	I	Cement Wall	R	Beige	F	0	0	0	0	0	0	0
12/16/2014	23	87		XP - 46 1/2	I	Cement Wall	R	Beige	F	0	0	0	0	0	0	0
12/16/2014	24	87		XP - 46 1/2	I	Cement Block Wall	R	Beige	F	0	0	0	0	0	0	0
12/16/2014	25	87		XP - 46 1/2	I	Cement Floor	R	Yellow	F	0	11.3	40	117	0	0	0
12/16/2014	26	87		XP - 46 1/2	I	Brick Wall	R	Beige	F	0	0	0	0	0	0	0
12/16/2014	27	87		XP - 46 1/2	I	Cement Wall	R	Beige	F	0	0	0	0	0	0	0
12/16/2014	28	87		XP - 45 1/2	I	Cement Floor	R	Tan	F	0	0	0	0	0	0	0
12/16/2014	29	87		XP - 45 1/2	I	Cement Block Wall	R	Beige	F	0	0	0	0	0	0	0
12/16/2014	30	87		XP - 45 1/2	I	Cement Wall	R	Beige	F	0	0	0	0	0	0	0
12/16/2014	31	87		XP - 46 1/2	I	Cement Wall	R	Beige	F	0	0	0	0	0	0	0
12/16/2014	32	87		XP - 46 1/2	I	Cement Floor	R	Light Green	F	0	60	3.2	0	0	0	0
12/16/2014	33	87		XP - 46 1/2	I	Cement Floor	R	Grey	F	0	23	0	111	0	0	0
12/16/2014	34	87		XP - 46 1/2	I	Cement Wall	R	Maroon	F	0	0	19.3	0	0	0	0
12/16/2014	35	87		XP - 46 1/2	I	Cement Block Wall	R	Maroon	F	0	0	31	0	0	0	0
12/16/2014	36	87		XR - 47 1/2	I	Brick Wall	R	Beige	F	0	0	0	0	0	0	0
12/16/2014	37	87		XP - 47 1/2	I	Cement Wall	R	Beige	F	0	0	0	0	0	0	0

Date	Test #	Building #	Section & Floor	Location	Int (I) Ext (E)	Substrate	Rough (R) Smooth (S)	Color	Type Gloss (G) Flat (F)	As (ppm)	Ba (ppm)	Cd (ppm)	Cr (ppm)	Hg (ppm)	Se (ppm)	Ag (ppm)
12/16/2014	38	87		XR - 48	I	Cement Floor	R	Grey	F	0	0	0	19	0	0	0
12/16/2014	39	87		XR - 49	I	Cement Wall	R	Beige	F	0	0	0	0	0	0	0
12/16/2014	40	87		XR - 50	I	Cement Wall	R	Beige	F	0	0	0	0	0	0	0
12/16/2014	41	87		XP - 48 1/2	I	Cement Wall	R	Brown	F	0	0	0	0	0	0	0
12/16/2014	42	87		XP - 48 1/2	I	Cement Block Wall	R	Brown	F	0	0	0	0	3.2	0	0
12/16/2014	43	87		XP - 48 1/2	I	Cement Wall	R	Beige	F	0.58	0	0	0	6.7	4	0
12/16/2014	44	87		XP - 49 1/2	I	Cement Wall	R	Beige	F	0	0	0	0	0	0	0
12/16/2014	45	87		XP - 50	I	Cement Wall	R	Beige	F	0	0	0	0	0	0	0
12/16/2014	46	87		XP - 50	I	Cement Floor	R	Grey	F	0	0	0	217	0	0	0
12/16/2014	47	87		XP - 48 1/2	I	Cement Floor	R	Grey	F	0	0	0	71	0	0	0
12/16/2014	48	87		XP - 48 1/2	I	Cement Floor	R	Grey	F	0	0	0	189	0	0	0
12/16/2014	49	87		XP - 48 1/2	I	Cement Wall	R	Yellow	F	0	79	31	941	0	0	0
12/16/2014	50	87		XP - 48 1/2	I	Cement Wall	R	Beige	F	0	0	0	0	0	0	0
12/16/2014	51	87		XP - 48 1/2	I	Cement Block Wall	R	Beige	F	0	0	0	0	0	0	0
12/16/2014	52	87		XP - 48 1/2	I	Cement Floor	R	Grey	F	0	0	0	123	0	0	0
12/16/2014	53	87		XN - 48 1/2	I	Cement Wall	R	Beige	F	0	0	0	0	0	0	0
12/16/2014	54	87		XN - 48 1/2	I	Cement Block Wall	R	Beige	F	0	0	0	0	0	0	0
12/16/2014	55	87		XN - 48 1/2	I	Cement Floor	R	Grey	F	0	0	0	0	0	0	0
12/16/2014	56	87		XN - 48 1/2	I	Cement Wall	R	Beige	F	0	0	0	0	0	0	0
12/16/2014	57	87		XN - 49	I	Cement Wall	R	Beige	F	0	0	0	0	0	0	0
12/16/2014	58	87		XN - 49 1/2	I	Cement Wall	R	Beige	F	0	0	0	0	0	0	0
12/16/2014	59	87		XN - 49 1/2	I	Cement Floor	R	Grey	F	0	0	0	0	2.8	0	0
12/16/2014	60	87		XN - 48 1/2	I	Cement Floor	R	Grey	F	0	0	0	0	2.1	0	0
12/16/2014	61	87		XN - 48 1/2	I	Cement Block Wall	R	Beige	F	0	0	0	0	0	0	0
12/16/2014	62	87		XL - 48 1/2	I	Cement Wall	R	Beige	F	0	0	0	0	0	0	0
12/16/2014	63	87		XL - 49 1/2	I	Cement Wall	R	Beige	F	0	0	0	0	0	0	0
12/16/2014	64	87		XL - 49 1/2	I	Cement Wall	R	Beige	F	0	0	0	0	1.1	0	0
12/16/2014	65	87		XL - 49 1/2	I	Cement Floor	R	Grey	F	0	207	0	287	8.7	0	0
12/16/2014	66	87		XL - 48 1/2	I	Cement Floor	R	Grey	F	0	180	0	103	6.9	0	0
12/16/2014	67	87		XJ - 48 1/2	I	Cement Wall	R	Beige	F	0	0	0	0	0	0	0
12/16/2014	68	87		XL - 48 1/2	I	Cement Block Wall	R	Beige	F	0	0	0	0	0	0	0
12/16/2014	69	87		XJ - 49	I	Cement Wall	R	Beige	F	0	0	0	0	0	0	0
12/16/2014	70	87		XJ - 49 1/2	I	Cement Wall	R	Beige	F	0	0	0	0	0	0	0
12/16/2014	71	87		XJ - 50	I	Cement Floor	S	Yellow	F	0	300	39	0	0	0	0
12/16/2014	72	87		XJ - 49 1/2	I	Cement Floor	S	Grey	F	0	195	0	92	1.4	0	0
12/16/2014	73	87		XJ - 48 1/2	I	Cement Wall	S	Biege	F	0	0	0	0	0	6.8	17
12/16/2014	74	87		XJ - 48 1/2	I	Cement Block Wall	R	Biege	F	0	0	0	0	0	0	0
12/16/2014	75	87		XJ - 48 1/2	I	Cement Floor	S	Grey	F	0	7.3	0	239	2.3	0	0
12/16/2014	76	87		XG - 49 1/2	I	Cement Floor	S	Light Grey	F	0	1.2	0	164	0	0	0
12/16/2014	77	87		XG - 49 1/2	I	Cement Wall	S	Beige	F	0	0	0	0	0	0	0

Date	Test #	Building #	Section & Floor	Location	Int (I) Ext (E)	Substrate	Rough (R) Smooth (S)	Color	Type Gloss (G) Flat (F)	As (ppm)	Ba (ppm)	Cd (ppm)	Cr (ppm)	Hg (ppm)	Se (ppm)	Ag (ppm)
12/16/2014	78	87		XG - 50	I	Cement Wall	S	Beige	F	0	0	0	0	0	0	0
12/16/2014	79	87		XG - 49 1/2	I	Cement Floor	S	Grey	F	0	1.1	0	63	0	0	0
12/16/2014	80	87		XG - 48 1/2	I	Cement Wall	S	Beige	F	0	0	0	0	0	0	0
12/16/2014	81	87		XG - 48 1/2	I	Cement Floor	S	Grey	F	0	2.9	0	88	0	0	0
12/16/2014	82	87		XG - 48 1/2	I	Cement Wall	S	Biege	F	0	0	0	0	0	0	0
12/16/2014	83	87		XG - 48 1/2	I	Cement Floor	S	Dark Grey	F	0	7.2	0	0	0	0	0
12/16/2014	84	87		XG - 48 1/2	I	Cement Wall	S	Black	F	0	0	0	0	0	0	0
12/16/2014	85	87		XG - 48 1/2	I	Cement Block Wall	R	Beige	F	0	0	0	0	0	0	0
12/16/2014	86	87		XG - 48 1/2	I	Cement Block Wall	R	Light Grey	F	0	0	0	0	0	0	0
12/16/2014	87	87		XG - 48 1/2	I	Brick Wall	R	Light Grey	F	0	0	0	0	0	0	0
12/16/2014	88	87		XE - 49 1/2	I	Cement Wall	S	White	F	0	0	0	245	0	2.1	0
12/16/2014	89	87		XE - 49 1/2	I	Cement Wall	S	White	F	0	0	0	292	0	0	0
12/16/2014	90	87		XE - 49 1/2	I	Cement Floor	S	Grey	F	0	8.8	0	217	0	0	0
12/16/2014	91	87		XE - 48 1/2	I	Cement Block Wall	R	White	F	0	0	0	136	0	0	0
12/16/2014	92	87		XE - 49 1/2	I	Cement Wall	S	White	F	0	0	0	61	3.1	0	0
12/16/2014	93	87		XE - 49 1/2	I	Cement Wall	S	White	F	0	0	0	180	2.3	0	0
12/16/2014	94	87		XE - 47 1/2	I	Brick Wall	R	Beige	F	0	0	0	0	0	0	0
12/16/2014	95	87		XE - 47 1/2	I	Cement Wall	S	Beige	F	0	0	4.1	0	0	0	0
12/16/2014	96	87		XE - 47 1/2	I	Cement Wall	S	Beige	F	0	0	1.1	0	0	0	0
12/16/2014	97	87		XE - 47 1/2	I	Cement Floor	S	Grey	F	0	0	0	207	1.4	0	0
12/16/2014	98	87		XE - 47 1/2	I	Cement Wall	S	Beige	F	0	0	1.3	0	0	0	0
12/16/2014	99	87		XE - 47 1/2	I	Brick Wall	S	Beige	F	0	0	4.1	0	0	0	0
12/16/2014	100	87		XG - 47	I	Cement Wall	S	Beige	F	0	0	3.9	0	0	0	0
12/16/2014	101	87		XG - 47	I	Cement Floor	S	Grey	F	0	12.2	0	146	0	1.8	0
12/16/2014	102	87		XG - 47	I	Cement Wall	S	White	F	0	0	0	0	0	0	0
12/16/2014	103	87		XG - 47	I	Cement Floor	S	Grey	F	0	15.2	0	123	0	0	0
12/16/2014	104	87		XJ - 47	I	Brick Wall	R	White	F	0	0	0	0	0	0	0
12/16/2014	105	87		XJ - 47	I	Cement Wall	S	White	F	0	0	0	0	0	0	0
12/16/2014	106	87		XJ - 47	I	Cement Floor	S	Grey	F	0	4.7	0	0	0	0	0
12/16/2014	107	87	2nd	2nd Floor	I	Cement Floor	S	Grey	F	0	30	0	0	0	0	0
12/16/2014	108	87	2nd	2nd Floor	I	Brick Wall	S	Black	F	0	0	0	0	0	0	0
12/16/2014	109	87	2nd	Bottom Near Entrance	I	Brick Wall	S	Grey	F	0	0	0	0	0	0	0
12/16/2014	110	87	2nd	Top Near Entrance	I	Brick Wall	S	White	F	0	0	0	0	0	0	0
12/16/2014	111	87	2nd	Top	I	Cement Wall	S	White	F	0	0	0	0	0	0	0
12/16/2014	112	87	2nd	Bottom Near Entrance	I	Cement Wall	S	Grey	F	0	0	0	0	0	0	0
12/16/2014	113	87	2nd	Stairway	I	Cement Wall	S	White	F	0	0	4.3	0	0	0	0
12/16/2014	114	87	2nd	88 Hallway Entrance	I	Cement Floor	S	Grey	F	0	0	0	0	0	0	0
12/16/2014	115	87	2nd	44 Hallway	I	Cement Wall	S	Beige	F	0	0	0	0	0	0	0
12/16/2014	116	87	2nd	45 Hallway	I	Cement Wall	S	Beige	F	0	0	0	0	0	0	0
12/16/2014	117	87	2nd	46 Hallway	I	Cement Wall	S	Beige	F	0	0	0	0	0	0	0

Date	Test #	Building #	Section & Floor	Location	Int (I) Ext (E)	Substrate	Rough (R) Smooth (S)	Color	Type Gloss (G) Flat (F)	As (ppm)	Ba (ppm)	Cd (ppm)	Cr (ppm)	Hg (ppm)	Se (ppm)	Ag (ppm)
12/16/2014	118	87	2nd	Off of Hallway 44	I	Cement Wall	S	Grey	F	0	0	0	0	0	0	0
12/16/2014	119	87	2nd	Off of Hallway 44	I	Cement Wall	S	Beige	F	0	0	0	0	0	0	0
12/16/2014	120	87	2nd	Off of Hallway 44	I	Brick Wall	S	Beige	F	0	0	0	0	0	0	0
12/16/2014	121	87	2nd	Off of Hallway 44	I	Brick Wall	S	Grey	F	0	0	0	0	0	0	0
12/16/2014	122	87	2nd	Off of Hallway 44	I	Brick Wall	S	Beige	F	0	0	0	0	0	0	0
12/16/2014	123	87	2nd	Off of Hallway 44	I	Brick Wall	S	White	F	0	0	5.1	0	0	0	0
12/16/2014	124	87	2nd	XG - 45 1/2	I	Cement Wall	S	White	F	0	0	2.7	0	0	0	0
12/16/2014	125	87	2nd	Off of Hallway 46	I	Cement Floor	S	Grey	F	0	0	0	0	0	0	0
12/16/2014	126	87	2nd	XG - 45 1/2	I	Concrete Boarder	S	Light Grey	F	0	0	0	232	4.7	9.3	0
12/16/2014	127	87	2nd	Off of Hallway 44	I	Cement Wall	S	Beige	F	0	0	0	0	0	0	0
12/16/2014	128	87	2nd	Off of Hallway 45	I	Brick Wall	S	Beige	F	0	0	0	0	0	0	0
12/16/2014	129	87	2nd	Off of Hallway 46	I	Cement Wall	S	Beige	F	0	0	0	0	0	0	0
12/17/2014	130	87		XA - 45 1/2	I	Cement Wall	S	Beige	F	0	0	0	0	0	0	0
12/17/2014	131	87		XA - 45 1/2	I	Cement Floor	S	Grey	F	0	71	0	140	0	0	0
12/17/2014	132	87		XA - 46	I	Cement Wall	S	Beige	F	0	0	0	0	0	0	0
12/17/2014	133	87		XA - 47	I	Cement Wall	S	Beige	F	0	0	0	0	0	0	0
12/17/2014	134	87		XA - 47	I	Cement Floor	S	Grey	F	0.07	45	0	44	0	0	0.34
12/17/2014	135	87		XA - 47 1/2	I	Cement Block Wall	R	Beige	F	0	0	0	0	0	0	0
12/17/2014	136	87		XA - 48 1/2	I	Cement Floor	S	Grey	F	0	0	0	40	0	0	0
12/17/2014	137	87		XA - 48 1/2	I	Cement Wall	S	Beige	F	0	0	0	0	0	0	0
12/17/2014	138	87		XA - 48 1/2	I	Cement Block Wall	R	Beige	F	0	0	0	0	0	0	0
12/17/2014	139	87		XA - 49 1/2	I	Cement Floor	S	Grey	F	0	3.6	0	94	13.9	0.89	0
12/17/2014	140	87		XA - 49 1/2	I	Cement Wall	S	Beige	F	0	0	0	0	0	0	0
12/17/2014	141	87		XA - 50	I	Cement Floor	S	Grey	F	0	9.1	0	229	12.4	0	0
12/17/2014	142	87		XA - 50	I	Cement Wall	S	Beige	F	0	0	0	0	0	0	0
12/17/2014	143	87		XC - 50	I	Cement Wall	S	Beige	F	0	0	0	0	0	0	0
12/17/2014	144	87		XA - 49	I	Cement Wall	S	Beige	F	0	0	0	0	0	0	0
12/17/2014	145	87		XC - 49 1/2	I	Cement Wall	S	Beige	F	0	0	0	0	0	0	0
12/17/2014	146	87		XC - 50	I	Cement Floor	S	Grey	F	0	2.1	0	99	11.1	0	0
12/17/2014	147	87		XC - 50	I	Cement Wall	S	Beige	F	0	0	0	0	0	0	0
12/17/2014	148	87		XC - 49 1/2	I	Cement Wall	R	Beige	F	0	0	0	0	0	0	0
12/17/2014	149	87		XE - 50	I	Cement Wall	S	Beige	F	0	0	0	0	0	0	0
12/17/2014	150	87		XE - 48 1/2	I	Cement Wall	S	Beige	F	0	0	0	0	0	0	0
12/17/2014	151	87		XE - 48 1/2	I	Cement Floor	S	Grey	F	0	0	0	117	12.6	0	0
12/17/2014	152	87		XE - 48	I	Cement Floor	S	Grey	F	0	7.9	0	124	18.9	0	0
12/17/2014	153	87		XC - 47	I	Cement Wall	S	Beige	F	0	0	0	0	0	0	0
12/17/2014	154	87		XC - 47	I	Cement Floor	S	Grey	F	0	11.7	0	0	1.7	0	0
12/17/2014	155	87		XC - 47 1/2	I	Cement Floor	S	Grey	F	0	9.8	0	0	7.7	0	0
12/17/2014	156	87		XC - 48 1/2	I	Cement Wall	S	Beige	F	0	0	0	0	0	0	0
12/17/2014	157	87		XC - 47 1/2	I	Brick Wall	S	Beige	F	0	0	0	0	0	0	0

Date	Test #	Building #	Section & Floor	Location	Int (I) Ext (E)	Substrate	Rough (R) Smooth (S)	Color	Type Gloss (G) Flat (F)	As (ppm)	Ba (ppm)	Cd (ppm)	Cr (ppm)	Hg (ppm)	Se (ppm)	Ag (ppm)
12/17/2014	158	87		XC - 46 1/2	I	Cement Floor	S	Grey	F	0	10.1	6.3	213	0	0	0
12/17/2014	159	87		XC - 46	I	Cement Wall	S	Beige	F	0	0	0	0	0	0	0
12/17/2014	160	87		XC - 45 1/2	I	Cement Wall	S	Beige	F	0	0	0	0	0	0	0
1/8/2015	65	87		XJ 1/2 - 45 1/2	I	Concrete Ceiling	S	White	F	0	87	0	0	0	0	0
1/8/2015	66	87		XK - 46	I	Concrete Ceiling	S	Tan	F	0	0	3.2	0	0	0	0
1/8/2015	67	87		XL - 46 1/2	I	Concrete Ceiling	S	Tan	F	0	0	7.1	0	0	0	0
1/8/2015	68	87		XM 1/2 - 45 1/2	I	Concrete Ceiling	S	Tan	F	0	0	5.5	0	0	0	0
1/8/2015	69	87		XN 1/2 46	I	Concrete Ceiling	S	Tan	F	0	0	6.9	0	0	0	0
1/8/2015	70	87		XR - 49 1/2	I	Concrete Ceiling	S	Tan	F	0	0	3	0	0	0	0
1/8/2015	71	87		XQ - 47 1/2	I	Concrete Ceiling	S	Tan	F	0.01	0	5.7	0	0	0	0
1/8/2015	72	87		XP - 48 1/2	I	Concrete Ceiling	S	Tan	F	0	0	1.1	0	0	0	0
1/8/2015	73	87		XN - 49	I	Concrete Ceiling	S	Tan	F	0	0	0	0	0	0	0
1/8/2015	74	87		XM 1/2 - 49 1/2	I	Concrete Ceiling	S	Tan	F	0	0	2.8	0	0	0	0
1/8/2015	75	87		XL - 49	I	Concrete Ceiling	S	Tan	F	0	0	8.4	0	0	0	0
1/8/2015	76	87		XJ 1/2 - 49	I	Concrete Ceiling	S	Tan	F	0	0	0	0	0	0	0
1/8/2015	77	87		XJ 1/2 - 47 1/2	I	Concrete Ceiling	S	Tan	F	0	0	0	0	0	0	0
1/8/2015	78	87		XH - 49	I	Concrete Ceiling	S	Tan	F	0	0	1.3	0	0	0	0
1/8/2015	79	87		XF - 49	I	Concrete Ceiling	S	Tan	F	0	0	6	0	0	0	0
1/8/2015	80	87		XE - 49	I	Concrete Ceiling	S	Off-White	F	0	0	0	0	0	0	0
1/8/2015	81	87		XE 1/2 - 47 1/2	I	Concrete Ceiling	S	White	F	0	0	0	275	13.8	0	0
1/8/2015	82	87		XB - 46	I	Concrete Ceiling	S	White	F	0	0	0	144	0	0	0
1/8/2015	83	87		XD - 48	I	Concrete Ceiling	S	White	F	0	0	0	90	8.1	0.7	0
1/8/2015	84	87		XD 1/2 - 49 1/2	I	Concrete Ceiling	S	Off-White	F	0	0	0	0	0	0	0
1/8/2015	85	87		XC 1/2 - 49 1/2	I	Concrete Ceiling	S	Tan	F	0	0	3.7	0	0	0	0
1/8/2015	86	87		XB 1/2 - 49 1/2	I	Concrete Ceiling	S	Tan	F	0	0	1.1	0	0	0	0
1/8/2015	87	87		XA 1/2 - 49 1/2	I	Concrete Ceiling	S	Tan	F	0	0	0	0	0	0	0
1/8/2015	88	87		XA - 46	I	Concrete Ceiling	S	Tan	F	0	0	8.4	0	0	0	0
1/8/2015	89	87		XB - 47 1/2	I	Concrete Ceiling	S	White	F	0	0	0	39	0	0	0
1/7/2015	18	88		TD - 50	I	Brick Wall	R	Light Blue	F	0	0	11.7	190	0	0	0
1/7/2015	19	88		TD - 50	I	Brick Wall	R	Tan	F	0	0	0	0	0	0	0
1/7/2015	20	88		TC - 50 1/2	I	Cement Block Wall	R	Tan	F	0	0	0	0	0	0	0
1/7/2015	21	88		TC 1/2 - 50	I	Cement Floor	S	Light Blue	F	0	9.8	0	0	0	0	0
1/7/2015	22	88		TD - 48	I	Brick Wall	R	Tan	F	0	0	0	0	0	0	0
1/7/2015	23	88		TD - 47	I	Cement Block Wall	R	Tan	F	0	0	0	0	0	0	0
1/7/2015	24	88		TA - 50	I	Concrete Wall	S	Tan	F	0	0	0	0	0	0	0
1/7/2015	25	88		Ta 1/2 - 50	I	Cement Floor	S	Light Blue	F	0.01	64	18.4	0	18.9	0	0
1/7/2015	26	88		TA 1/2 - 50 1/2	I	Cement Block Wall	R	Tan	F	0.01	0	0	0	0	0	0
1/7/2015	27	88		TA - 47 1/2	I	Concrete Wall	S	Tan	F	0	0	0	0	0	0	0
1/7/2015	28	88		TB - 45	I	Brick Wall	R	Tan	F	0	0	0	0	0	0	0
1/7/2015	29	88		TC 1/2 - 47 1/2	I	Cement Floor	S	Light Blue	F	0	20	13.9	101	22.1	0	0.18

Date	Test #	Building #	Section & Floor	Location	Int (I) Ext (E)	Substrate	Rough (R) Smooth (S)	Color	Type Gloss (G) Flat (F)	As (ppm)	Ba (ppm)	Cd (ppm)	Cr (ppm)	Hg (ppm)	Se (ppm)	Ag (ppm)
1/7/2015	30	88		TA - 47 1/2	I	Cement Floor	S	Light Blue	F	0	41	17.6	97	24.7	0	0
1/7/2015	60	88		TA 1/2 - 45	I	Concrete Ceiling	S	White	F	0.01	0	0	0	0	0	0
1/7/2015	61	88		TC 1/2 -48	I	Concrete Ceiling	S	White	F	0	0	0	0	0	0	0
1/7/2015	62	88		TA 1/2 - 49 1/2	I	Concrete Ceiling	S	White	F	0	0	0	0	0	0	0
1/7/2015	63	88		TB 1/2 - 47	I	Concrete Ceiling	S	White	F	0	0	1.1	0	0	0	0
1/7/2015	(1/9) 17	88		TC 50 1/2 (upstairs)	I	Cement Block Wall	R	Light Blue	F	0	0	29	0	20.2	0	0
12/8/2014	64	92	1	Q9	I	Cement Block Wall	S	Beige	F	0	0	0	0	0	0	0
12/8/2014	65	92	1	P9.5	I	Cement Block Wall	S	Green	F	0	0	0	0	0	0	0
12/8/2014	66	92	1	J10	I	Concrete Wall	S	Beige	F	0	0	0	0	0	0	0
12/8/2014	67	92	1	J8	I	Concrete Wall	S	Beige	F	0	0	0	0	0	0	0
12/8/2014	68	92	1	J7	I	Concrete Wall	S	Beige	F	0	0	0	0	0	0	0
12/8/2014	69	92	1	J6.5	I	Concrete Wall	S	White	F	0	0	0	0	0	0	0
12/8/2014	70	92	1	QR10	I	Cement Block Wall	S	Tan	F	0	0	0	0	0	0	0
12/8/2014	71	92	1	QR10	I	Cement Block Wall	S	Tan	F	0.04	0	0	0	0	0	0
12/8/2014	72	92	1	Q2	I	Cement Block Wall	S	Beige	F	0	0	0	0	0	0	0
12/8/2014	73	92	1	P1.5	I	Cement Block Wall	S	Tan	F	0	0	0	0	0	0	0
12/8/2014	74	92	1	J1.5	I	Concrete Wall	S	White	F	0	0	5.1	131	1.1	0.86	0
12/8/2014	75	92	1	J2.5	I	Concrete Wall	S	White	F	0	0	2.3	143	4.1	0.22	0
12/8/2014	76	92	1	J4	I	Cement Block Wall	S	White	F	0	0	0	167	2.7	0	0
12/8/2014	77	92	1	K4	I	Cement Block Wall	S	White	F	0	0	1.1	118	3.9	0	0
12/8/2014	78	92	1	J4	I	Cement Block Wall	S	Tan	F	0	0	0	0	0	0	0
12/8/2014	79	92	1	C5	I	Cement Block Wall	S	White	F	0	0	9.8	1	4.1	0	0
12/8/2014	80	92	1	CD5	I	Cement Block Wall	S	Tan	F	0	0	0	0	0	0	0
12/8/2014	81	92	1	B5	I	Cement Block Wall	S	Tan	F	0	0	0	0	0	0	0
12/8/2014	82	92	1	G2	I	Cement Block Wall	S	Tan	F	0	0	0	0	0	0	0
12/8/2014	83	92	1	GH2	I	Cement Block Wall	S	Tan	F	0	0	0	0	0	0	0
12/8/2014	84	92	1	D5	I	Cement Block Wall	S	Tan	F	0	0	0	0	0	0	0
12/8/2014	85	92	1	J2.5	I	Cement Block Wall	S	Tan	F	0	0	0	0	0	0	0
12/8/2014	86	92	1	B6	I	Cement Block Wall	S	White	F	0	0	0	15	0	0	0
12/8/2014	87	92	1	G9	I	Cement Block Wall	S	White	F	0	0	0	78	0	0	0
12/8/2014	88	92	1	J9	I	Cement Block Wall	S	Tan	F	0	0	0	0	0	0	0
12/8/2014	89	92	1	J6.5	I	Concrete Wall	S	Tan	F	0	0	0	0	0	0	0
12/8/2014	90	92	2	J1	I	Concrete Wall	S	Tan	F	0	0	0	0	0	0	0
12/8/2014	91	92	2	H1	I	Cement Block Wall	S	Tan	F	0	0	0	0	0	0	0
12/8/2014	92	92	2	GH1	I	Cement Block Wall	S	White	F	0	0	0	0	0	0	0
12/8/2014	93	92	2	B5	I	Cement Block Wall	S	White	F	0	0	0	0	0	0	0
12/8/2014	94	92	2	B6.5	I	Cement Block Wall	S	White	F	0	0	0	0	0	0	0
12/8/2014	95	92	2	G9.5	I	Cement Block Wall	S	Tan	F	0	0	2.1	0	0	0	0
12/8/2014	96	92	2	H9	I	Cement Block Wall	S	White	F	0	0	0	0	0	0	0
12/8/2014	97	92	2	H10	I	Cement Block Wall	S	Tan	F	0	0	0	0	0	0	0

Date	Test #	Building #	Section & Floor	Location	Int (I) Ext (E)	Substrate	Rough (R) Smooth (S)	Color	Type Gloss (G) Flat (F)	As (ppm)	Ba (ppm)	Cd (ppm)	Cr (ppm)	Hg (ppm)	Se (ppm)	Ag (ppm)
12/8/2014	98	92	2	J9	I	Concrete Wall	S	Tan	F	0	0	0	0	0	0	0
12/8/2014	99	92	2	C6.5	I	Cement Block Wall	S	White	F	0	0	0	77	0	0	0
12/8/2014	100	92	2	C4.5	I	Cement Block Wall	S	White	F	0	0	6.3	102	0	0	0
12/8/2014	101	92	2	H2	I	Cement Block Wall	S	White	F	0	0	1.1	103	0	0	0
12/8/2014	102	92	2	J6.5	I	Concrete Wall	S	Tan	F	0	0	0	0	0	0	0
12/8/2014	103	92	2	H9	I	Cement Block Wall	S	Beige	F	0	0	0	0	0	0	0
12/8/2014	104	92	2	H9.5	I	Cement Block Wall	S	Beige	F	0	0	0	0	0	0	0
12/8/2014	105	92	2	C6	I	Cement Block Wall	S	Beige	F	0	0	0	0	0	0	0
12/8/2014	106	92	2	BC5	I	Cement Block Wall	S	Beige	F	0	0	0	0	0	0	0
12/8/2014	107	92	2	H2	I	Cement Block Wall	S	Beige	F	0	0	0	0	0	0	0
12/8/2014	108	92	2	H1.5	I	Cement Block Wall	S	Beige	F	0	0	0	0	0	0	0
12/9/2014	116	92	2	Q1	I	Cement Block Wall	S	Beige	F	0	0	0	0	0	0	0
12/9/2014	117	92	2	Q1.5	I	Cement Block Wall	S	Beige	F	0	0	0	0	0	0	0
12/9/2014	118	92	2	QR9.5	I	Cement Block Wall	S	Grey	F	0	0	0	20	14.3	0.9	0
12/9/2014	119	92	2	Q10	I	Cement Block Wall	S	Beige	F	0	16.8	0	0	0	0	0
12/9/2014	120	92	2	Q9.5	I	Cement Block Wall	S	Beige	F	0	0	0	0	0	0	0
12/9/2014	121	92	2	P9.5	I	Cement Block Wall	S	Grey	F	0	11.4	0	127	17	0	0
12/9/2014	122	92	2	J7	I	Cement Block Wall	S	Grey	F	0	19.1	0	82	19.4	0	0
12/9/2014	123	92	2	L3	I	Concrete Wall	S	Grey	F	0	0	0	50	3.8	0	0
12/9/2014	124	92	2	N3	I	Concrete Wall	S	Grey	F	0	0	0	90	6.7	0	0
12/9/2014	125	92	2	P3	I	Concrete Wall	S	Grey	F	0	0	0	139	9.2	0	0
12/9/2014	126	92	2	P5.5	I	Concrete Wall	S	Grey	F	0	0	4.1	153	8.6	0	0.7
12/9/2014	127	92	2	P8	I	Concrete Wall	S	Grey	F	0	0	1	154	6.9	0	0
12/9/2014	128	92	2	N8	I	Concrete Wall	S	Grey	F	0	0	7.9	138	2.4	0	0
12/9/2014	129	92	2	N5.5	I	Concrete Wall	S	Grey	F	0	0	0	27	4.7	0	0
12/9/2014	130	92	2	L5.5	I	Concrete Wall	S	Grey	F	0	0	0	196	6.8	0	0
12/9/2014	131	92	2	L8	I	Concrete Wall	S	Grey	F	0	0	0	26	9.1	0	0
12/9/2014	132	92	2	BC5.5	I	Floor	S	Beige	F	0	0	0	0	0	0	0
12/9/2014	133	92	2	H5.5	I	Floor	S	Beige	F	0	0	0	0	0	0	0
12/9/2014	134	92	2	J9	I	Floor	S	Beige	F	0	0	0	0	0	0	0
12/9/2014	135	92	2	H2	I	Floor	S	Beige	F	0	0	0	0	0	0	0
12/9/2014	136	92	2	J2.5	I	Floor	S	Green	F	0	280	11.7	0	0	0	0
12/9/2014	137	92	2	R8	I	Floor	S	Beige	F	0	0	0	0	0	0	0
12/9/2014	138	92	2	R3	I	Floor	S	Beige	F	0	0	0	0	0	0	0
12/9/2014	139	92	2	Q4	I	Floor	S	Green	F	0	357	18.3	0	0	0	0
12/9/2014	140	92	2	J5	I	Floor	S	Beige	F	0	0	0	0	0	0	0
12/9/2014	141	92	2	J9	I	Floor	S	Beige	F	0	6.9	0	0	0	0	0
12/9/2014	142	92	2	H9	I	Floor	S	Green	F	0	224	9.1	0	0	0	0
12/9/2014	143	92	2	C5	I	Floor	S	Beige	F	0	0	0	0	0	0	0
12/9/2014	144	92	2	J1	I	Floor	S	Beige	F	0	0	0	0	0	0	0

Date	Test #	Building #	Section & Floor	Location	Int (I) Ext (E)	Substrate	Rough (R) Smooth (S)	Color	Type Gloss (G) Flat (F)	As (ppm)	Ba (ppm)	Cd (ppm)	Cr (ppm)	Hg (ppm)	Se (ppm)	Ag (ppm)
12/9/2014	159	92	Basement	F4	I	Column	S	White	F	0	0	0	0	0	0	0
12/9/2014	160	92	Basement	B6	I	Cement Block Wall	S	Tan	F	0	0	0	0	0	0	0
12/9/2014	161	92	Basement	B6	I	Floor	S	Beige	F	0	0	0	0	0	0	0
12/9/2014	162	92	Basement	BC6.5	I	Cement Block Wall	S	Tan	F	0	0	0	0	0	0	0
12/9/2014	163	92	Basement	H9.5	I	Floor	S	Beige	F	0	0	0	0	0	0	0
12/9/2014	164	92	Basement	H9.5	I	Cement Block Wall	S	Tan	F	0	0	0	0	0	0	0
12/9/2014	165	92	Basement	H7	I	Floor	S	Grey	F	0	0	0	0	0	0	0
12/9/2014	166	92	Basement	H1.5	I	Cement Block Wall	S	Tan	F	0	0	0	0	0	0	0
12/9/2014	167	92	Basement	H1.5	I	Floor	S	Beige	F	0	0	0	0	0	0	0
12/9/2014	168	92	Basement	B4	I	Floor	S	Blue	F	0	0	13.2	72	0	0	0
12/9/2014	169	92	Basement	C7.5	I	Floor	S	Blue	F	0	0	22	0	0	0	0
12/9/2014	170	92	Basement	F8	I	Floor	S	Grey	F	0	0	0	0	0	0	0
12/9/2014	171	92	Basement	G6	I	Floor	S	Grey	F	0	0	0	0	0	0	0
12/9/2014	172	92	Basement	G6	I	Column	S	Tan	F	0	0	0	0	0	0	0
12/10/2014	203	98		A	I	Cement Floor	S	Light Grey	F	0	0	0	0	0	0	0
12/10/2014	204	98		A	I	Concrete Barrier	S	Grey	G	0	0	0	0	0	0	0
12/10/2014	205	98		C	I	Concrete Barrier	S	Grey	G	0	0	0	0	0	0	0
12/10/2014	206	98		C	I	Cement Block Wall	R	White	F	0	0	0	0	0	0	0
12/10/2014	207	98		A	I	Cement Floor	S	Light Grey	F	0	0	0	0	0	0	0
12/10/2014	208	98		B	I	Cement Wall	R S	White	G	0	0	0	0	0	0	0
12/10/2014	209	98		B	I	Cement Block Wall	R	Baby Blue	F	0	770	0	0	0	0	0
12/10/2014	210	98		B	I	Cement Block Wall	R	White	G	0	691	0	0	0	0	0
12/10/2014	211	98		B	I	Cement Floor	S	Grey	F	0	0	0	0	0	0	0
12/10/2014	212	98		B	I	Cement Wall	R S	White	F	0	0	0	0	0	0	0
12/10/2014	213	98		B	I	Cement Block Wall	R	White	F	0	701	0	0	0	0	0
12/10/2014	214	98		D	I	Cement Floor	S	Light Grey	F	0	0	0	0	0	0	0
4/6/2014	78	GSA 1		H10	I	Cement Block Wall	R	Tan	F	0	0	0	0	0	0	0
4/6/2014	90	GSA 1		J10	I	Cement Block Wall	R	Blue	F	0	145	0	0	0	0	0
4/6/2014	91	GSA 1		H10	I	Cement Block Wall	R	White	F	0	14.1	2.7	0	0	0	0
4/6/2014	92	GSA 1		G10	I	Cement Block Wall	R	White	F	0	30	6.3	0	0	0	0
4/6/2014	93	GSA 1		G10	I	Cement Block Wall	R	White	F	0	19.3	0	0	0	0	0
4/6/2014	94	GSA 1		G10	I	Cement Block Wall	R	White	F	0	8.8	1.1	0	0	0	0
4/6/2014	95	GSA 1		D9	I	Cement Block Wall	R	White	F	0	2.7	9.5	0	0	0	0
4/6/2014	96	GSA 1		D9	I	Cement Block Wall	R	Off-White	F	0	5.3	0	0	0	0	0
4/6/2014	97	GSA 1		C10	I	Cement Block Wall	R	Yellow	F	0	904	22	190	24.4	0.67	3.83
4/6/2014	98	GSA 1		B8	I	Cement Block Wall	R	Teal	F	0	78	0	0	0	0	0
4/6/2014	99	GSA 1		B9	I	Concrete Column	S	Teal	F	0	0	0	119	0	0	0
4/6/2014	100	GSA 1		C9	I	Concrete Column	S	Yellow	F	0.01	0	0.45	16	18.7	0.98	0
4/6/2014	101	GSA 1		C8	I	Cement Block Wall	R	White	F	0	0	0	0	0	0	0
4/6/2014	102	GSA 1		B8	I	Cement Block Wall	R	White	F	0	0	0	0	0	0	0

Date	Test #	Building #	Section & Floor	Location	Int (I) Ext (E)	Substrate	Rough (R) Smooth (S)	Color	Type Gloss (G) Flat (F)	As (ppm)	Ba (ppm)	Cd (ppm)	Cr (ppm)	Hg (ppm)	Se (ppm)	Ag (ppm)
4/6/2014	103	GSA 1		A6	I	Concrete Wall	S	White	F	0	0	0	0	0	0	0
4/6/2014	104	GSA 1		E5	I	Cement Block Wall	R	Green	F	0	41	0	0	0	0	0
4/6/2014	105	GSA 1		A1	I	Cement Block Wall	R	White	F	0	0	0	0	0	0	0
4/6/2014	106	GSA 1		G2	I	Cement Block Wall	R	White	F	0	0	0	0	0	0	0
4/6/2014	107	GSA 1		K1	I	Cement Block Wall	R	Off-White	F	0	0	1.7	145	0	0	0
4/6/2014	108	GSA 1		L1	I	Cement Floor	S	Grey	F	0	0	0	0	0	0	0
4/6/2014	109	GSA 1		L2	I	Cement Floor	S	Brown	F	0	0	17.4	0	0	3.1	4.4
4/6/2014	110	GSA 1		N2	I	Cement Block Wall	R	Tan	F	0	0	0	0	0	0	0
4/6/2014	111	GSA 1		N2	I	Cement Floor	S	Hazel	F	0	0	0	0	0	0	0
4/6/2014	112	GSA 1		N2	I	Cement Floor	S	Orange	F	0	0	81	2	0	0	0
4/6/2014	113	GSA 1		P6	I	Cement Floor	S	Hazel	F	0	0	0	0	0	0	0
4/6/2014	114	GSA 1		P5	I	Cement Block Wall	R	Tan	F	0	0	0	0	0	0	0
4/6/2014	115	GSA 1		N4	I	Cement Floor	S	Hazel	F	0	0	0	0	0	0	0
4/6/2014	116	GSA 1		N6	I	Cement Block Wall	R	Tan	F	0	0	0	0	0	0	0
4/6/2014	117	GSA 1		N6	I	Cement Block Wall	R	Tan	F	0	0	0	0	0	0	0
4/6/2014	118	GSA 1		N7	I	Cement Floor	S	Hazel	F	0	0	0	0	0	0	0
4/6/2014	119	GSA 1		M9	I	Cement Floor	S	Hazel	F	0	0	0	0	0	0	0
4/6/2014	120	GSA 1		M9	I	Cement Block Wall	R	Tan	F	0	77	3.4	0	0	0	0
4/6/2014	121	GSA 1		N2	I	Cement Block Wall	R	Tan	F	0	94	3.3	0	48.5	2.7	6.3
4/6/2014	122	GSA 1		N2	I	Cement Block Wall	R	Tan	F	0	3.3	1.7	0	0	0	0
3/24/2015	163	GSA 1	Basement	A16	I	Cement Block Wall	R	White	F	0	141	0	0	0	0	0
3/24/2015	164	GSA 1	Basement	A16	I	Cement Wall	S	white	F	0	0	0	0	0	0	0
3/24/2015	165	GSA 1	Basement	A18	I	Cement Wall	S	Tan	F	0	0	6.1	0	0	0	0
3/24/2015	166	GSA 1	Basement	B18	I	Cement Block Wall	R	Tan	F	0	0	2.3	0	0	0	0
3/24/2015	167	GSA 1	Basement	C16	I	Cement Wall	S	White	F	0	0	0	43	0	0	0
3/24/2015	168	GSA 1	Basement	C16	I	Cement Block Wall	R	White	F	0	0	9.4	63	0	0	0
3/24/2015	169	GSA 1	Basement	E16	I	Cement Stairs	S	Blue	F	0	0	0	0	0	0	0
3/24/2015	170	GSA 1	Basement	E16	I	Cement Stairs, Hand Rails	S	White	G	0.01	3.9	8.8	177	18.1	0	0
3/24/2015	171	GSA 1	Basement	E16	I	Cement Block Wall	R	White	G	0	0	6.1	176	0	0	0
3/24/2015	172	GSA 1	Basement	E17	I	Cement Column	S	Grey	F	0	1.4	0	0	0	0	0
3/24/2015	173	GSA 1	Basement	G17	I	Cement Block Wall	R	White	F	0	0	3.4	91	7.6	0	0
3/24/2015	174	GSA 1	Basement	J18	I	Cement Block Wall	R	Off-White	F	0	2.2	0	0	0	0	0
3/24/2015	175	GSA 1	Basement	J18	I	Cement Block Wall	R	Off-White	F	0	0	0	0	0	0	0
3/24/2015	176	GSA 1	Basement	J16	I	Cement Block Wall	R	White	F	0	0	0	6	8.1	0	0
3/24/2015	177	GSA 1	Basement	J16	I	Cement Wall	S	White	F	0	0	0	143	1.5	0	0
3/24/2015	178	GSA 1	Basement	M18	I	Cement Block Wall	R	Off-White	G	0	0	0	0	0	0	0
3/24/2015	179	GSA 1	Basement	N18	I	Cement Block Wall	R	Off-White	G	0	0	0	0	0	0	0
3/24/2015	180	GSA 1	Basement	O18	I	Cement Block Wall	R	Mint-Green	F	0	0	3.1	28	0	0	0
3/24/2015	181	GSA 1	Basement	O18	I	Cement Block Wall	R	Tan	F	0	0	0	0	0	0	0
3/24/2015	182	GSA 1	Basement	Q15	I	Cement Block Wall	R	White	F	0	99	0	138	1.1	0	0

Date	Test #	Building #	Section & Floor	Location	Int (I) Ext (E)	Substrate	Rough (R) Smooth (S)	Color	Type Gloss (G) Flat (F)	As (ppm)	Ba (ppm)	Cd (ppm)	Cr (ppm)	Hg (ppm)	Se (ppm)	Ag (ppm)
3/24/2015	183	GSA 1	Basement	Q15	I	Cement Block Wall	R	Off-White	F	0	130	0	99	0	0	0
3/24/2015	184	GSA 1	Basement	Q14	I	Cement Wall	S	White	F	0	29	0	0	0	0	0
3/24/2015	185	GSA 1	Basement	Q14	I	Cement Floor	S	Hazel	F	0	144	0	0	0	0	0
3/24/2015	186	GSA 1	Basement	Q14	I	Cement Block Wall	R	Green	F	0	13.4	6.7	0	0	0	0
3/24/2015	187	GSA 1	Basement	Q14	I	Cement Floor	S	Green	F	0	9.1	5.1	0	0	0	0
3/24/2015	188	GSA 1	Basement	Q14	I	Cement Wall	S	Blue	F	0	0	0	0	0	0	0
3/24/2015	189	GSA 1	Basement	Q13	I	Cement Column	S	Lavender	F	0	99	0	53	0	0	0
3/24/2015	190	GSA 1	Basement	Q12	I	Cement Wall	S	White	F	0	0	0	0	0	0	0
3/24/2015	191	GSA 1	Basement	Q10	I	Brick-Clay	S	Purple	F	0	0	0	86	0	0	0
3/24/2015	192	GSA 1	Basement	Q10	I	Cement Wall	S	White	F	0.02	0	0	0	0	0	0
3/24/2015	193	GSA 1	Basement	Q10	I	Cement Block Wall	R	White	F	0	0	0	0	0	0	0
3/24/2015	194	GSA 1	Basement	Q16	I	Cement Block Wall	R	White	F	0	0	0	0	0	0	0
3/24/2015	195	GSA 1	Basement	Q16	I	Cement Wall	S	White	F	0	0	0	0	0	0	0
3/24/2015	196	GSA 1	Basement	Q16	I	Cement Wall	S	White	F	0	0	0	118	0	0	0
3/24/2015	197	GSA 1	Basement	Q16	I	Cement Block Wall	R	White	F	0	0	0	0	0	0	0
3/24/2015	209	GSA 1	Basement	Q15	I	Cement Block Wall	R	White	F	0	0	0	0	0	0	0
3/24/2015	210	GSA 1	Basement	P15	I	Cement Block Wall	R	White	F	0	0	0	0	0	0	0
3/24/2015	211	GSA 1	Basement	O18	I	Cement Block Wall	R	Blue	F	0	0	7.1	103	0	0	0
3/24/2015	212	GSA 1	Basement	R14	I	Cement Wall	S	White	F	0	0	0	0	0	0	0
3/24/2015	213	GSA 1	Basement	R14	I	Cement Block Wall	R	Periwinkle	F	0	0	2	200	16.7	0	0.94
3/24/2015	214	GSA 1	Basement	R15	I	Cement Block Wall	R	Blue	F	0	0	9.7	0	0	0	0
3/24/2015	215	GSA 1	Basement	R16	I	Cement Stair Hand Rail	S	Off-White	F	0.03	0	0	0	0	0	0
3/24/2015	216	GSA 1	Basement	P15	I	Cement Block Wall	R	Light Green	F	0	60	3.3	0	6.6	0	0
3/24/2015	217	GSA 1	Basement	P14	I	Cement Column	S	Purple	F	0	0	16.8	0	6.8	0	0
3/24/2015	218	GSA 1	Basement	P16	I	Cement Wall	S	Green	F	0	0	7.1	0	0	0	0
3/24/2015	219	GSA 1	Basement	Q13	I	Cement Floor	S	Brown	F	0	0	0	0	0	0	0
3/24/2015	220	GSA 1	Basement	Q12	I	Cement Wall	S	White	F	0	0	0	0	0	0	0
3/24/2015	221	GSA 1	Basement	Q16	I	Cement Block Wall	R	White	F	0	0	0	0	0	0	0
3/24/2015	222	GSA 1	Basement	O16	I	Cement Wall	S	White	F	0	0	0	0	0	0	0
3/24/2015	223	GSA 1	Basement	O17	I	Cement Block Wall	R	White	F	0	0	0	0	0	0	0
3/24/2015	224	GSA 1	Basement	O15	I	Cement Block Wall	R	White	F	0.08	0	0	0	0	0	0
3/24/2015	225	GSA 1	Basement	R15	I	Cement Block Wall	R	White	F	0	0	0	0	0	0	0
3/24/2015	226	GSA 1	Basement	R16	I	Cement Wall	S	White	F	0	0	0	0	0	0	0
3/24/2015	227	GSA 1	Basement	R14	I	Brick Wall	R	Tan	F	0	0	0	0	0	0	0
3/24/2015	228	GSA 1	Basement	P15	I	Cement Wall	S	Tan	F	0	0	0	0	0	0	0
3/24/2015	229	GSA 1	Basement	P14	I	Cement Block Wall	R	Tan	F	0	0	0	0	0	0	0
3/24/2015	230	GSA 1	Basement	P16	I	Cement Floor	S	Grey	F	0	0	1.12	19	0	0	0
3/24/2015	231	GSA 1	Basement	Q13	I	Cement Wall	S	White	F	0	0	0	43	0	0	0
3/24/2015	232	GSA 1	Basement	Q12	I	Cement Block Wall	R	White	F	0	0	0	10	0	0	0
3/24/2015	233	GSA 1	Basement	Q16	I	Cement Wall	S	Red	F	0	600	86	230.2	40.8	2.6	0

Date	Test #	Building #	Section & Floor	Location	Int (I) Ext (E)	Substrate	Rough (R) Smooth (S)	Color	Type Gloss (G) Flat (F)	As (ppm)	Ba (ppm)	Cd (ppm)	Cr (ppm)	Hg (ppm)	Se (ppm)	Ag (ppm)
3/24/2015	234	GSA 1	Basement	O16	I	Cement Block Wall	R	Red	F	0	950	59	887.3	61.8	0.18	7.1
3/24/2015	235	GSA 1	Basement	O17	I	Cement Wall	S	Blue	F	0	0	0	0	0	0	0
3/24/2015	236	GSA 1	Basement	O15	I	Cement Block Wall	R	Blue	F	0	0	0	0	0	0	0
3/24/2015	237	GSA 1	Basement	R15	I	Cement Block Wall	R	Navy Green	F	0	77	0	120	0	0	0
3/24/2015	238	GSA 1	Basement	R16	I	Cement Block Wall	R	Yellow	F	0	0	0	0	0	0	0
3/24/2015	239	GSA 1	Basement	R14	I	Cement Wall	S	Navy Green	F	0	0	0	157	0	0	0
3/24/2015	240	GSA 1	Basement	P15	I	Cement Wall	S	Yellow	F	0	0	6.7	69	0	0	0
3/24/2015	241	GSA 1	Basement	P14	I	Cement Block Wall	R	Yellow	F	0	0	9	172	0	0	0
3/24/2015	242	GSA 1	Basement	P16	I	Cement Hand Rail	S	Tan	F	0	0	0	0	0	0	0
3/24/2015	243	GSA 1	Basement	Q13	I	Cement Stairs	S	Black	F	0	0	0	0	0	0	0
3/24/2015	244	GSA 1	Basement	Q12	I	Cement Column	S	Tan	F	0	0	0	0	0	0	0
3/24/2015	245	GSA 1	Basement	P15	I	Cement Block Wall	R	White	F	0	0	0	0	0	0	0
3/24/2015	246	GSA 1	Basement	P14	I	Cement Floor	S	Grey	F	0	0	0	193	0	0	0
3/24/2015	247	GSA 1	Basement	P16	I	Cement Wall	S	White	F	0	1,2	0	0	0	0	0
3/24/2015	248	GSA 1	Basement	Q13	I	Cement Wall	S	Black	F	0	6.6	0	0	0	0	0
3/24/2015	249	GSA 1	Basement	Q12	I	Cement Floor	S	Grey	F	0	8	1.2	200	0	0	0
3/24/2015	250	GSA 1	Basement	Q16	I	Cement Block Wall	R	White	F	0	0	0	0	0	0	0
3/24/2015	251	GSA 1	Basement	P15	I	Cement Hand Rail	S	White	F	0	0	0	0	0	0	0
3/24/2015	252	GSA 1	Basement	P14	I	Cement Wall	S	White	F	0	3.4	0	0	0	0	0
3/24/2015	253	GSA 1	Basement	P16	I	Cement Floor	S	Green	F	0	0	0	0	0	0	0
3/24/2015	254	GSA 1	Basement	Q13	I	Cement Wall	S	White	F	0	7	0	0	0	0	0
3/24/2015	255	GSA 1	Basement	Q12	I	Cement Block Wall	R	White	F	0	0	0	0	0	0	0
3/24/2015	256	GSA 1	Basement	Q16	I	Cement Wall	S	White	F	0	19.8	0	0	0	0	0
3/24/2015	257	GSA 1	Basement	O16	I	Cement Block Wall	R	White	F	0	0	0	0	0	0	0
3/24/2015	258	GSA 1	Basement	P15	I	Cement Block Wall	R	Salmon	F	0	0	0	0	0	0	0
3/24/2015	259	GSA 1	Basement	P14	I	Cement Column	S	Red	F	0	890	142	654.8	5.7	0.3	6.8
3/24/2015	260	GSA 1	Basement	P16	I	Cement Column	S	Grey	F	0	0	0	0	0	0	0
3/24/2015	261	GSA 1	Basement	Q13	I	Cement Floor	S	Grey	F	0	0	0	0	0	0	0
3/24/2015	262	GSA 1	Basement	Q12	I	Cement Wall	S	White	F	0	0	0	0	0	0	0
3/24/2015	263	GSA 1	Basement	Q16	I	Cement Block Wall	R	White	F	0	0	3.1	0	0	0	0
3/24/2015	264	GSA 1	Basement	O16	I	Cement Column	S	Blue	F	0	0	0	0	0	0	0
3/24/2015	265	GSA 1	Basement	O17	I	Cement Column	S	Blue	F	0	0	0	0	0	0	0
3/24/2015	266	GSA 1	Basement	D15	I	Cement Wall	S	White	F	0	0	1.2	0	0	0	0
3/24/2015	267	GSA 1	Basement	D16	I	Cement Block Wall	R	White	F	0	0	1.5	0	0	0	0
3/24/2015	268	GSA 1	Basement	D16	I	Cement Floor	S	Blue	F	0	19.5	0	0	0	0	0
3/24/2015	269	GSA 1	Basement	D16	I	Ranged Floor	S	Red	F	0	71	89	772	0	0	0
3/24/2015	270	GSA 1	Basement	K16	I	Cement Floor	S	Grey	F	0	0	0	155	0	0	0
3/24/2015	271	GSA 1	Basement	K16	I	Cement Block Wall	R	White	F	0	0	0	0	0	0	0
3/24/2015	272	GSA 1	Basement	J17	I	Cement Block Wall	R	White	F	0	0	0	0	0	0	0
3/24/2015	273	GSA 1	Basement	Q14	I	Cement Wall	S	White	F	0	0	0	0	0	0	0

Date	Test #	Building #	Section & Floor	Location	Int (I) Ext (E)	Substrate	Rough (R) Smooth (S)	Color	Type Gloss (G) Flat (F)	As (ppm)	Ba (ppm)	Cd (ppm)	Cr (ppm)	Hg (ppm)	Se (ppm)	Ag (ppm)
3/24/2015	274	GSA 1	Basement	R19	I	Cement Block Wall	R	White	F	0	0	0	0	0	0	0
3/24/2015	275	GSA 1	Basement	R18	I	Cement Wall	S	White	F	0.01	0	0	159	8.8	0	0
3/24/2015	276	GSA 1	Basement	Q15	I	Cement Block Wall	R	White	F	0	0	0	0	0	0	0
3/24/2015	277	GSA 1	Basement	P15	I	Cement Block Wall	R	White	F	0	0	0	0	0	0	0
3/24/2015	278	GSA 1	Basement	Q16	I	Cement Block Wall	R	Peach	F	0	8.4	3.8	0	0	0	0
3/24/2015	279	GSA 1	Basement	Q17	I	Cement Block Wall	S	Peach	F	0	17.1	7	0	0	0	0
3/24/2015	280	GSA 1	Basement	P15	I	Cement Block Wall	R	White	F	0	0	0	0	0	0	0
3/24/2015	281	GSA 1	Basement	R14	I	Cement Block Wall	R	White	F	0	0	0	0	0	0	0
3/24/2015	282	GSA 1	Basement	R15	I	Cement Block Wall	R	Green	F	0	90	14.5	0	0	0	0
3/24/2015	283	GSA 1	Basement	R`6	I	Cement Wall	S	Tan	F	0	0	0	0	0	0	0
3/24/2015	284	GSA 1	Basement	Q17	I	Cement Wall	S	White	F	0	0	0	0	0	0	0
3/24/2015	285	GSA 1	Basement	Q16	I	Clay Brick	S	White	F	0	0	0	0	0	0	0
3/24/2015	286	GSA 1	Basement	Q15	I	Cement Block Wall	R	White	F	0	0	0	0	0	0	0
3/24/2015	287	GSA 1	Basement	Q14	I	Cement Floor	S	Grey	F	0	0	0	0	0	0	0
3/24/2015	288	GSA 1	Basement	Q16	I	Cement Block Wall	R	White	F	0	0	0	0	0	0	0
3/24/2015	300	GSA 1	Basement	Q17	I	Cement Block Wall	R	Mint Green	F	0	72	16.9	980	0	0	0
4/2/2015	262	GSA 1	Basement	AA17	I	Concrete Ceiling	S	White	F	0	2.7	0	153	0	0	0
4/2/2015	263	GSA 1	Basement	AA17	I	Concrete Ceiling	S	White	F	0	6.4	2.1	37	0	0	0
4/2/2015	264	GSA 1	Basement	T16	I	Concrete Ceiling	S	White	F	0.07	19.8	1.9	41	18.4	0	0
4/2/2015	265	GSA 1	Basement	T17	I	Concrete Ceiling	S	White	F	0	1.2	6.1	78	21.1	0	0
4/2/2015	266	GSA 1	Basement	T18	I	Concrete Ceiling	S	White	F	0	37	13.8	114	31.6	6.7	1.1
4/2/2015	267	GSA 1	Basement	A19	I	Concrete Ceiling	S	White	F	0	14	9.9	3	16.4	0	0
4/2/2015	268	GSA 1	Basement	A23	I	Concrete Ceiling	S	White	F	0	29	3.1	87	6.6	0	0
4/2/2015	269	GSA 1	Basement	A24	I	Concrete Ceiling	S	White	F	0	22	4.7	93	1.5	0	0
4/2/2015	270	GSA 1	Basement	A10	I	Concrete Ceiling	S	White	F	0	41	8.1	12	1.9	0	0
4/2/2015	271	GSA 1	Basement	A6	I	Concrete Ceiling	S	White	F	0	17.7	2.2	5	9.7	0	0
4/2/2015	272	GSA 1	Basement	A2	I	Concrete Ceiling	S	White	F	0	50	11.8	166	5.1	0	0
4/2/2015	273	GSA 1	Basement	A3	I	Concrete Ceiling	S	Yellow	F	0	2.3	18.7	197	1.2	0	0
4/2/2015	274	GSA 1	Basement	A4	I	Concrete Ceiling	S	White	F	0	1.1	0	0	1.9	0	0
4/2/2015	275	GSA 1	Basement	A5	I	Concrete Ceiling	S	White	F	0	7.4	1.6	141	0.67	0	0
4/2/2015	276	GSA 1	Basement	A6	I	Concrete Ceiling	S	Tan	F	0	0	0	155	0	0	0
4/2/2015	277	GSA 1	Basement	A24	I	Concrete Ceiling	S	Tan	F	0	0	0	49	0	0	0
4/2/2015	278	GSA 1	Basement	A26	I	Concrete Ceiling	S	Light Tan	F	0	0	0	109	0	0	0
4/2/2015	290	GSA 1	Basement	AA17	I	Concrete Ceiling	S	Tan	F	0	0	0	157	0	0	0
4/2/2015	291	GSA 1	Basement	Y17	I	Concrete Ceiling	S	White	F	0	90	0	14	0	0	0
4/2/2015	292	GSA 1	Basement	Y17	I	Concrete Ceiling	S	White	F	0	145	2.8	160	0	0	0
4/2/2015	293	GSA 1	Basement	Y17	I	Concrete Ceiling	S	Tan	F	0	61	0	125	0	0	0
4/2/2015	294	GSA 1	Basement	Y17	I	Concrete Column	S	Beige	F	0	80	0	164	0	0	0
4/2/2015	295	GSA 1	Basement	Y17	I	Concrete Ceiling	S	White	F	0	0	1.1	114	0	0	0
4/2/2015	296	GSA 1	Basement	Y17	I	Concrete Ceiling	S	White	F	0	17.2	3.4	113	0	0	0

Date	Test #	Building #	Section & Floor	Location	Int (I) Ext (E)	Substrate	Rough (R) Smooth (S)	Color	Type Gloss (G) Flat (F)	As (ppm)	Ba (ppm)	Cd (ppm)	Cr (ppm)	Hg (ppm)	Se (ppm)	Ag (ppm)
4/2/2015	297	GSA 1	Basement	Y17	I	Concrete Ceiling	S	Light Tan	F	0	1.1	0	44	0	0	0
4/2/2015	298	GSA 1	Basement	Y17	I	Concrete Ceiling	S	White	F	0.7	62	0	187	0	0	0
4/2/2015	299	GSA 1	Basement	Y17	I	Concrete Ceiling	S	White	F	0	20	6.1	34	0	0	0
4/2/2015	300	GSA 1	Basement	Y17	I	Concrete Ceiling	S	White	F	0	19.6	2.8	21	0	0	0
4/2/2015	301	GSA 1	Basement	Y17	I	Concrete Ceiling	S	Light Tan	F	0	97	0	37	0	0	0
4/2/2015	302	GSA 1	Basement	Y17	I	Concrete Ceiling	S	Light Tan	F	0	45	0	140	0	0	0
4/4/2015	43	GSA 1		A23	I	Concrete Wall	S	White	F	0	0	0	113	0	0	0
4/4/2015	44	GSA 1		A23	I	Cement Block Wall	R	White	F	0	0	0	112	0	0	0
4/4/2015	45	GSA 1		A17	I	Concrete Wall	S	Grey	F	0	0	0	0	0	0	0
4/4/2015	46	GSA 1		A18	I	Concrete Wall	S	Tan	F	0	0	16.4	177	0	0	0
4/4/2015	47	GSA 1		A19	I	Cement Block Wall	R	Tan	F	0	0	0	0	0	0	0
4/4/2015	48	GSA 1		A20	I	Cement Block Wall	R	Tan	F	0	0	0	0	0	0	0
4/4/2015	49	GSA 1		A21	I	Cement Block Wall	R	Tan	F	0	0	0	143	0	0	0
4/4/2015	50	GSA 1		C20	I	Cement Block Wall	R	Tan	F	0	0	0	0	0	0	0
4/4/2015	51	GSA 1		F21	I	Cement Block Wall	R	White	F	0	0	0	0	0	0	0
4/4/2015	52	GSA 1		E20	I	Cement Floor	S	Grey	F	0	0	0	97	0	0	0
4/4/2015	53	GSA 1		E21	I	Concrete Column	S	Tan	F	0	0	0	266	0	0	0
4/4/2015	54	GSA 1		E17	I	Cement Block Wall	R	Red	F	0	43	148	917.5	66.9	0.04	0.99
4/4/2015	56	GSA 1		E17	I	Cement Block Wall	R	White	F	0	0	0	0	0	0	0
4/4/2015	57	GSA 1		C17	I	Concrete Column	S	Red	F	0	72	113	800.1	93.4	0	3.1
4/4/2015	58	GSA 1		E21	I	Cement Floor	S	Beige	F	0	0	0	0	0	0	0
4/4/2015	59	GSA 1		F21	I	Cement Floor	S	Grey	F	0	0	0	80	0	0	0
4/4/2015	60	GSA 1		F22	I	Cement Floor	S	Grey	F	0	0	0	210	0	0	0
4/4/2015	61	GSA 1		E23	I	Cement Block Wall	R	Beige	F	0	1.1	0	0	0	0	0
4/4/2015	62	GSA 1		E23	I	Concrete Wall	S	Beige	F	0	0	0	0	0	0	0
4/4/2015	63	GSA 1		E23	I	Concrete Wall	S	Grey	F	0	0	1.5	227	0	0	0
4/4/2015	64	GSA 1		E23	I	Concrete Wall	S	Off-White	F	0	0	0	139	0	0	0
4/4/2015	65	GSA 1		E23	I	Cement Block Wall	R	Grey	F	0	5.2	3.8	232	0	0	0
4/4/2015	66	GSA 1		E23	I	Cement Block Wall	R	Off-White	F	0	19.7	0	34	0	0.11	0
4/4/2015	67	GSA 1		F19	I	Concrete Column	S	Green	F	0	0	1	570	0	0	0
4/4/2015	68	GSA 1		F19	I	Concrete Column	S	Tan	F	0	0	0	0	0	0	0
4/4/2015	69	GSA 1		J16	I	Cement Block Wall	R	Orange	F	0	0	8.8	0	0	0	0
4/4/2015	70	GSA 1		J15	I	Cement Block Wall	R	White	F	0	0	0	75	0	0	0
4/4/2015	71	GSA 1		H13	I	Cement Block Wall	R	White	F	0	0	0	0	0	0	0
4/4/2015	72	GSA 1		E15	I	Cement Block Wall	R	Off-White	F	0	0	0	0	0	0	0
4/4/2015	73	GSA 1		B16	I	Cement Block Wall	R	White	F	0	0	0	472	16.8	0	0
4/4/2015	74	GSA 1		B16	I	Concrete Wall	S	White	F	0	4.2	0	433	14.1	0	0
4/4/2015	75	GSA 1		E12	I	Cement Block Wall	R	Black	F	0	0	0	0	0	0	0
4/4/2015	76	GSA 1		J11	I	Cement Floor	S	Black	F	0	3.9	0	0	0	0	0
4/4/2015	77	GSA 1		H10	I	Cement Block Wall	R	Green	F	0	0	0	0	0	0	0

Date	Test #	Building #	Section & Floor	Location	Int (I) Ext (E)	Substrate	Rough (R) Smooth (S)	Color	Type Gloss (G) Flat (F)	As (ppm)	Ba (ppm)	Cd (ppm)	Cr (ppm)	Hg (ppm)	Se (ppm)	Ag (ppm)
4/7/2015	123	GSA 1		N2	I	Cement Block Wall	R	Tan	F	0	0	0	114	0	0	0
4/7/2015	124	GSA 1		M5	I	Cement Block Wall	R	White	F	0	0	0	0	0	0	0
4/7/2015	125	GSA 1		M6	I	Cement Block Wall	R	White	F	0	0	0	0	0	0	0
4/7/2015	126	GSA 1		M7	I	Cement Block Wall	R	Grey	F	0	0	0	0	0	0	0
4/7/2015	127	GSA 1		Q1	I	Cement Block Wall	R	White	F	0	0	0	0	0	0	0
4/7/2015	128	GSA 1		R6	I	Cement Block Wall	R	Baby Blue	F	0	414	0	0	0	0	0
4/7/2015	129	GSA 1		Q6	I	Cement Block Wall	R	Tan	F	0	0	0	0	0	0	0
4/7/2015	130	GSA 1		R7	I	Cement Block Wall	R	Tan	F	0	0	0	0	0	0	0
4/7/2015	131	GSA 1		Q9	I	Concrete Wall	S	Tan	F	0	0	0	0	0	0	0
4/7/2015	132	GSA 1		S10	I	Cement Block Wall	R	Tan	F	0	0	0	0	0	0	0
4/7/2015	133	GSA 1		VOID	I		R S		F	0	0	0	0	0	0	0
4/7/2015	134	GSA 1		P7	I	Cement Block Wall	R	Tan	F	0	0	0	0	0	0	0
4/7/2015	135	GSA 1		Q6	I	Cement Block Wall	R	White	F	0	0	0	0	0	0	0
4/7/2015	136	GSA 1		P7	I	Cement Block Wall	R	White	F	0	0	0	0	0	0	0
4/7/2015	137	GSA 1		U10	I	Cement Block Wall	R	White	F	0	0	0	0	0	0	0
4/7/2015	138	GSA 1		U10	I	Cement Block Wall	R	White	F	0	0	0	329	0	0	0
4/7/2015	139	GSA 1		V10	I	Cement Floor	S	Grey	F	0	0	0	0	0	0	0
4/7/2015	140	GSA 1		V10	I	Raised Cement Floor	S	Red	F	0	0	0	560	85	0	0
4/7/2015	141	GSA 1		AA9	I	Cement Floor	S	Yellow	F	3	169	89	1637	16.9	3.7	0
4/7/2015	142	GSA 1		AA9	I	Cement Block Wall	R	Grey	F	0	0	14.2	209	27.7	0	0
4/7/2015	143	GSA 1		AA9	I	Cement Block Wall	R	Tan	F	0	0	1.9	0	0	0	0
4/7/2015	144	GSA 1		AA10	I	Cement Block Wall	R	Tan	F	0	67	13.2	0	0	0	0
4/7/2015	145	GSA 1		AA3	I	Cement Block Wall	R	Tan	F	0	280	2.2	0	0	0	0
4/7/2015	146	GSA 1		Y5	I	Brick Wall	R	Tan	F	0	0	0	0	0	0	0
4/7/2015	147	GSA 1		AA6	I	Cement Block Wall	R	Tan	F	0	117	6.8	0	0	0	0
4/7/2015	148	GSA 1		Y6	I	Cement Floor	S	Brown	F	0	0	0	0	0	0	0
4/7/2015	149	GSA 1		Y7	I	Cement Block Wall	R	Tan	F	0	0	0	0	0	0	0
4/7/2015	150	GSA 1		Y8	I	Cement Block Wall	R	Tan	F	0	79	0	0	0	0	0
4/7/2015	151	GSA 1		Y8	I	Cement Floor	S	Brown	F	0	0	0	307	0	0	0
4/7/2015	152	GSA 1		Y9	I	Cement Floor	S	Tan	F	0	0	0	0	0	0	0
4/7/2015	153	GSA 1		AA9	I	Cement Block Wall	R	Tan	F	0	240	2.7	0	0	0	0
4/7/2015	154	GSA 1		X9	I	Cement Floor	S	Hazel	F	0	0	0	0	0	0	0
4/7/2015	155	GSA 1		W10	I	Cement Block Wall	R	Tan	F	0	0	0	0	0	0	0
4/7/2015	156	GSA 1		W1	I	Cement Block Wall	R	Tan	F	0	0	0	0	0	0	0
4/7/2015	157	GSA 1		X1	I	Concrete Column	S	Yellow	F	0.09	200	45	2308	55	0	0
4/7/2015	158	GSA 1		W2	I	Concrete Wall	S	Tan	F	0	0	0	0	0	0	0
4/10/2015	303	GSA 1		H2	I	Cement Block Wall	R	Grey	F	0	0	0	154	0	0	0
4/10/2015	304	GSA 1		H2	I	Cement Block Wall	R	Beige	F	0	0	0	353	0	0	0
4/10/2015	305	GSA 1		H2	I	Cement Block Wall	R	Tan	F	0	0	0	0	0	0	0
4/10/2015	306	GSA 1		G2	I	Cement Block Wall	R	Mint Green	F	0	407	11.9	190	0	0	0

Date	Test #	Building #	Section & Floor	Location	Int (I) Ext (E)	Substrate	Rough (R) Smooth (S)	Color	Type Gloss (G) Flat (F)	As (ppm)	Ba (ppm)	Cd (ppm)	Cr (ppm)	Hg (ppm)	Se (ppm)	Ag (ppm)
4/10/2015	307	GSA 1		G2	I	Cement Block Wall	R	Tan	F	0	0	0	368	1.5	0	0
4/10/2015	308	GSA 1		F3	I	Cement Floor	S	Orange	F	0	0	0	0	0	0	0
4/10/2015	309	GSA 1		E4	I	Concrete Column	S	Green	F	0	3.9	1.2	176	0	0	0
4/10/2015	310	GSA 1		E4	I	Concrete Column	S	Mint Green	F	0	0	0	0	0	0	0
4/10/2015	311	GSA 1		E5	I	Concrete Column	S	Orange	G	0.74	45	14.9	123	0.38	0.52	0
4/10/2015	312	GSA 1		E5	I	Concrete Column	S	Black	G	0	0	0	572	0	0	0
4/10/2015	313	GSA 1		H9	I	Concrete Column	S	Beige	F	0	0	3.2	136	0	0	0
4/10/2015	314	GSA 1		H9	I	Concrete Column	S	Grey	F	0.66	88	7.9	40	9.7	0.48	0
4/10/2015	315	GSA 1		G7	I	Cement Floor	S	Hazel	F	0	0	0	0	0	0	0
4/10/2015	316	GSA 1		K7	I	Cement Floor	S	Hazel	F	0	0	0	0	0	0	0
4/10/2015	317	GSA 1		K4	I	Cement Floor	S	Hazel	F	0	0	0	0	0	0	0
4/10/2015	318	GSA 1		N7	I	Cement Floor	S	Hazel	F	0	0	0	0	0	0	0
4/10/2015	319	GSA 1		B20	I	Concrete Ceiling	S	White	F	0	111	1.5	0	14.1	0	0
4/10/2015	320	GSA 1		E20	I	Concrete Ceiling	S	Black	F	0	0	0	0	0	0	0
4/10/2015	322	GSA 1		E16	I	Concrete Ceiling	S	Black	F	0	0	0	0	0	0	0
4/10/2015	323	GSA 1		J16	I	Concrete Ceiling	S	Black	F	0	0	0	0	0	0	0
4/10/2015	324	GSA 1		J10	I	Concrete Ceiling	S	Black	F	0	0	0	0	0	0	0
4/10/2015	325	GSA 1		E10	I	Concrete Ceiling	S	Black	F	0	0	0	117	0	0	0
4/10/2015	326	GSA 1		E4	I	Concrete Ceiling	S	Black	F	0	0	0	0	0	0	0
4/10/2015	327	GSA 1		A2	I	Concrete Ceiling	S	Black	F	0	0	0	0	0	0	0
4/10/2015	328	GSA 1		B8	I	Concrete Ceiling	S	Black	F	0	0	0	0	0	0	0
4/10/2015	329	GSA 1		E22	I	Concrete Ceiling	S	White	F	0	230	0	0	16.7	0	0
4/10/2015	330	GSA 1		M9	I	Concrete Ceiling	S	Black	F	0	0	0	0	0	0	0
4/10/2015	331	GSA 1		M2	I	Concrete Ceiling	S	Black	F	0	0	0	0	0	0	0
4/10/2015	332	GSA 1		Q2	I	Concrete Ceiling	S	Black	F	0	0	0	0	0	0	0
4/10/2015	333	GSA 1		Q10	I	Concrete Ceiling	S	Black	F	0	0	0	0	0	0	0
4/10/2015	334	GSA 1		Q15	I	Concrete Ceiling	S	Black	F	0	0	0	0	0	0	0
4/10/2015	343	GSA 1		Q18	I	Cement Floor	S	Brown	F	0	0	0	0	0	0	0
4/10/2015	344	GSA 1		Q18	I	Cement Block Wall	R	Tan	F	0	0	0	0	0	0	0
4/10/2015	345	GSA 1		N20	I	Cement Block Wall	R	Light Yellow	F	0	0	3.8	707	0	0	0
4/10/2015	346	GSA 1		N20	I	Concrete Column	S	Light Yellow	F	0	0	16.4	290	17.1	0	0
4/10/2015	347	GSA 1		Q18	I	Cement Floor	S	Red	F	0	710	1.2	1154	89.4	0.5	16.3
4/10/2015	348	GSA 1		K19	I	Concrete Ceiling	S	White	F	0	0	0	0	0	0	0
4/10/2015	349	GSA 1		E9	I	Concrete Ceiling	S	Tan	F	0	0	0	702	0	0	0
4/10/2015	350	GSA 1		E2	I	Concrete Ceiling	S	Off-White	F	0	0	0	0	0	0	0
	55	GSA 1		E17	I	Cement Block Wall	R	Purple	F	0	0	2.6	0	0	0	0
4/1/2015	204	GSA 2	1st	A22	I	Cement Block Wall	R	White	F	0	0	0	375	0	0	0
4/1/2015	205	GSA 2	1st	A22	I	Cement Block Wall	R	Tan	F	0	4.7	0	0	0	0	0
4/1/2015	206	GSA 2	1st	A22	I	Cement Column	S	Tan	F	0	9.9	0	0	0	0	0
4/1/2015	207	GSA 2	1st	A22	I	Cement Floor	S	Blue	F	0	0	0	0	0	0	0

Date	Test #	Building #	Section & Floor	Location	Int (I) Ext (E)	Substrate	Rough (R) Smooth (S)	Color	Type Gloss (G) Flat (F)	As (ppm)	Ba (ppm)	Cd (ppm)	Cr (ppm)	Hg (ppm)	Se (ppm)	Ag (ppm)
4/1/2015	208	GSA 2	1st	A22	I	Cement Block Wall	R	White	F	0	0	0	442	0	0	0
4/1/2015	209	GSA 2	1st	A22	I	Cement Block Wall	R	Tan	F	0	16.2	0	0	0	0	0
4/1/2015	210	GSA 2	1st	A21	I	Cement Column	S	Light Pink	F	0.58	27	41	395	5.4	0	0
4/1/2015	211	GSA 2	1st	A21	I	Cement Block Wall	R	Light Pink	F	0.39	30	59	121	6.6	0	0
4/1/2015	212	GSA 2	1st	A21	I	Cement Block Wall	R	White	F	0	0	32	0	0	0	0
4/1/2015	213	GSA 2	1st	A 22 1/2	I	Cement Column	S	White	F	0	0	6.7	0	0	0	0
4/1/2015	214	GSA 2	1st	A 22 1/2	I	Cement Block Wall	R	White	F	0	0	18.3	0	0	0	0
4/1/2015	215	GSA 2	1st	A 22 1/2	I	Cement Column	R	White	F	0	0	19	0	0	0	0
4/1/2015	216	GSA 2	1st	A 22 1/2	I	Cement Block Wall	S	Mint Green	F	0	1.2	3.1	217	0	0	0
4/1/2015	217	GSA 2	1st	A23	I	Cement Block Wall	R	Tan	F	0	0	0	367	24	0	0
4/1/2015	218	GSA 2	1st	A 22 1/2	I	Cement Column	S	Grey	F	0	67	0	0	0	0	0
4/1/2015	219	GSA 2	1st	A 22	I	Cement Block Wall	R	Grey	F	0	90	0	677	0	0	0
4/1/2015	220	GSA 2	1st	A23	I	Cement Floor	S	Blue	F	0	44	0	582	0	0	0
4/1/2015	221	GSA 2	1st	A 22 1/2	I	Cement Block Wall	R	White	F	0	180	0	0	0	0	0
4/1/2015	222	GSA 2	1st	A23	I	Cement Block Wall	R	Grey	F	0	95	0	51	0	0	0
4/1/2015	223	GSA 2	1st	A23	I	Cement Block Wall	R	Tan	F	6	50	16.1	1983	19	0	17.1
4/1/2015	224	GSA 2	1st	A25	I	Cement Block Wall	R	Black	F	0	44	2.2	1406	27	0	2.2
4/1/2015	225	GSA 2	1st	S19	I	Cement Block Wall	R	Tan	F	0	0	0	0	0	0	0
4/1/2015	226	GSA 2	1st	S19	I	Cement Floor	S	Blue	F	0	0	0	746	0	0	0
4/1/2015	227	GSA 2	1st	U19	I	Cement Block Wall	R	White	F	0	0	0	0	0	0	0
4/1/2015	228	GSA 2	1st	U19	I	Cement Column	S	Tan	F	0	0	0	78	0	0	0
4/1/2015	229	GSA 2	1st	U19	I	Cement Floor	S	Grey	F	0	0	0	188	0	0	0
4/1/2015	230	GSA 2	1st	U19	I	Cement Block Wall	S	Tan	F	0	0	0	0	0	0	0
4/2/2015	240	GSA 2	2nd	A9	I	Cement Block Wall	R	White	F	0	0	0	305	0	0	0
4/2/2015	241	GSA 2	2nd	A9	I	Cement Wall	S	White	F	0	66	0.85	0	0	0	0
4/2/2015	242	GSA 2	2nd	A9	I	Cement Block Wall	R	Brown	F	0	0	3.2	657	0	0	0
4/2/2015	243	GSA 2	2nd	A9	I	Cement Block Wall	R	Tan	F	0	40	2.1	477	0	0	0
4/2/2015	244	GSA 2	2nd	A9	I	Cement Block Wall	R	Green	F	0	305	1.1	368	11.7	0.64	0.36
4/2/2015	245	GSA 2	2nd	A8	I	Cement Block Wall	R	Green	F	0	417	0	16	19.4	0.7	0.11
4/2/2015	246	GSA 2	2nd	A8	I	Cement Block Wall	R	Tan	F	0	150	0	0	0	0	0
4/2/2015	247	GSA 2	2nd	A6	I	Cement Column	S	Green	F	0	0	1.8	468	16.9	0	0
4/2/2015	248	GSA 2	2nd	A6	I	Cement Block Wall	R	Off-White	F	0	111	5.4	201	15.4	0.88	0.01
4/2/2015	249	GSA 2	2nd	A1	I	Cement Block Wall	R	Off-White	F	0	1.2	0	0	0	0	0
4/2/2015	250	GSA 2	2nd	A1	I	Cement Block Wall	R	Off-White	F	0	0	0	547	0	0	0
4/2/2015	251	GSA 2	2nd	A1	I	Cement Block Wall	R	Blue	F	0	30	16.7	507	0	0	0
4/2/2015	252	GSA 2	2nd	A 4 1/2	I	Cement Floor	S	Grey	F	0	0	2.3	651	0	0	0
4/2/2015	253	GSA 2	2nd	Z17	I	Cement Wall	S	Baby Blue	F	0	0	0	0	0	0	0
4/2/2015	254	GSA 2	2nd	Y19	I	Cement Floor	S	Yellow	F	0	0	6.7	0	0	0	0
4/2/2015	255	GSA 2	2nd	Y19	I	Cement Block Wall	R	White	F	0	0	0	0	0	0	0
4/2/2015	256	GSA 2	2nd	Y16	I	Cement Block Wall	R	Black	F	14.9	0	10.8	646	45	0	0

Date	Test #	Building #	Section & Floor	Location	Int (I) Ext (E)	Substrate	Rough (R) Smooth (S)	Color	Type Gloss (G) Flat (F)	As (ppm)	Ba (ppm)	Cd (ppm)	Cr (ppm)	Hg (ppm)	Se (ppm)	Ag (ppm)
4/2/2015	257	GSA 2	2nd	Y16	I	Cement Block Wall	R	White	F	0	0	0	118	0	0	0
4/2/2015	258	GSA 2	2nd	Z18	I	Cement Block Wall	R	Off-White	F	0	0	0	0	0	0	0
4/2/2015	259	GSA 2	2nd	Z18	I	Cement Block Wall	R	Off-White	F	0	0	1.5	0	0	0	0
4/2/2015	260	GSA 2	2nd	Z18	I	Cement Column	S	White	F	0	19.7	8.3	167	0	0	0
4/3/2015	159	GSA 2	Basement	A16	I	Cement Block Wall	R	Gold	F	0	60	0.81	1146.1	67	0	3.4
4/3/2015	160	GSA 2	Basement	A16	I	Cement Block Wall	R	White	F	0	31	0.43	0	0	0	0
4/3/2015	161	GSA 2	Basement	A16	I	Concrete Wall	R	White	F	0	98	1.12	403	1.4	0	0.09
4/3/2015	162	GSA 2	Basement	A16	I	Cement Block Wall	R	Tan	F	0	0	0	0	0	0	0
4/3/2015	163	GSA 2	Basement	A16	I	Cement Block Wall	R	Light Blue	F	0	0	0	0	0	0	0
4/3/2015	164	GSA 2	Basement	A16	I	Cement Block Wall	R	Brown	F	0	0	0	0	6.7	0	0
4/3/2015	166	GSA 2	Basement	B18	I	Cement Block Wall	R	Grey	F	0	0	1.15	645	9.1	0	0
4/3/2015	167	GSA 2	Basement	C16	I	Concrete Wall	R	Grey	F	0	661	0	519	0	0	0
4/3/2015	168	GSA 2	Basement	C16	I	Cement Block Wall	R	Turquoise	F	0	0	0	0	0	0	0
4/3/2015	169	GSA 2	Basement	E16	I	Concrete Column	R	Turquoise	F	0	0	0	603	0	0	0
4/3/2015	170	GSA 2	Basement	E16	I	Cement Block Wall	R	Tan	F	0	99	0	0	0	0	0
4/3/2015	171	GSA 2	Basement	E16	I	Cement Block Wall	R	Beige	F	0	200	0	289	0	0	0
4/3/2015	172	GSA 2	Basement	E17	I	Cement Block Wall	R	Beige	F	0	84	0	0	0	0	0
4/3/2015	182	GSA 2	Basement	P20	I	Concrete Wall	R	White	F	0	0	0	0	0	0	0
4/3/2015	183	GSA 2	Basement	Q15	I	Cement Block Wall	R	White	F	0	50	0	0	0	0	0
4/3/2015	184	GSA 2	Basement	Q14	I	Cement Block Wall	R	Mint Green	F	0	15.1	6.7	1420	25	3.7	0.46
4/3/2015	185	GSA 2	Basement	Q14	I	Concrete Wall	R	Mint Green	F	0	72	9.3	769	29	4.9	0.5
4/3/2015	186	GSA 2	Basement	Q15	I	Cement Block Wall	R	White	F	17	101	44	503	37	8	0.31
4/3/2015	187	GSA 2	Basement	Q15	I	Cement Block Wall	R	White	F	0	94	0	0	0	0	0
4/3/2015	188	GSA 2	Basement	Q14	I	Cement Block Wall	R	White	F	0	200	0	0	0	0.01	0
4/3/2015	189	GSA 2	Basement	Q13	I	Concrete Wall	R	White	F	0	0	0	995	8.7	0.34	0
4/3/2015	190	GSA 2	Basement	Q12	I	Brick Wall	R	White	F	0	62	1.3	371	16.9	0	0.01
4/3/2015	191	GSA 2	Basement	Q10	I	Concrete Wall	R	White	F	0	0	0	141	0	0	0
4/3/2015	192	GSA 2	Basement	Q10	I	Concrete Wall	R	Green	F	0	4.7	0	474	21	0.09	0
4/3/2015	193	GSA 2	Basement	Q10	I	Concrete Wall	R	Mint Green	F	0	0	5.2	205	8.7	0	0
4/3/2015	194	GSA 2	Basement	Q10	I	Cement Block Wall	R	Mint Green	F	0	1.4	0	346	9.1	0.07	0
4/3/2015	195	GSA 2	Basement	Q10	I	Cement Block Wall	R	Green	F	0	33	0	408	0	0.04	0.11
4/3/2015	196	GSA 2	Basement	Q10	I	Cement Block Wall	R	White	F	0	18	0	113	0	0	0
4/3/2015	197	GSA 2	Basement	Q10	I	Cement Block Wall	R	Tan	F	0	9.6	6.8	491	1.4	0	0
4/3/2015	198	GSA 2	Basement	Q10	I	Concrete Column	R	White	F	0	0	0	8	0	0	0
4/3/2015	199	GSA 2	Basement	Q10	I	Cement Block Wall	R	White	F	0	17.7	13.7	219	17	5.5	3.1
4/3/2015	200	GSA 2	Basement	Q10	I	Concrete Wall	R	White	F	0.01	0	0	466	0	0	0
4/3/2015	201	GSA 2	Basement	Q10	I	Cement Block Wall	R	Tan	G	0	0	0	95	0	0	0
4/3/2015	202	GSA 2	Basement	Q10	I	Brick Wall	R	White	F	0	0	0	340	0	0	0
4/12/2015	483	GSA 2	2nd	A	I	Concrete Ceiling	S	White	F	0	0	0	245	0	0	0
4/12/2015	484	GSA 2	2nd	B	I	Concrete Ceiling	S	White	F	0	0	0	101	0	0	0

Date	Test #	Building #	Section & Floor	Location	Int (I) Ext (E)	Substrate	Rough (R) Smooth (S)	Color	Type Gloss (G) Flat (F)	As (ppm)	Ba (ppm)	Cd (ppm)	Cr (ppm)	Hg (ppm)	Se (ppm)	Ag (ppm)
4/12/2015	485	GSA 2	2nd	B	I	Concrete Ceiling	S	White	F	0	0	0	0	0	0	0
4/12/2015	486	GSA 2	2nd	E	I	Concrete Ceiling	S	White	F	0	0	0	35	0	0	0
4/12/2015	487	GSA 2	2nd	D	I	Concrete Ceiling	S	Off-White	F	0	0	0	0	0	0	0
4/12/2015	489	GSA 2	2nd	E	I	Concrete Ceiling	S	Off-White	F	0	0	0	0	0	0	0
4/12/2015	490	GSA 2	2nd	E	I	Concrete Ceiling	S	Off-White	F	0	0	0	89	0	0	0
4/12/2015	491	GSA 2	2nd	H	I	Concrete Ceiling	S	Beige	F	0	90	0	0	0	0	0
4/12/2015	492	GSA 2	2nd	H	I	Concrete Ceiling	S	Off-White	F	0	66	0	194	0	0	0
4/12/2015	493	GSA 2	2nd	H	I	Concrete Ceiling	S	Green	F	0	140	2.4	155	20.9	0	0
4/12/2015	494	GSA 2	2nd	H	I	Concrete Ceiling	S	Tan	F	0	75	0	0	0	0	0
4/13/2015	411	GSA 2	1st	A	I	Concrete Ceiling	S	White	F	0.01	39	11.8	29	0	0	0
4/13/2015	412	GSA 2	1st	B	I	Concrete Ceiling	S	Tan	F	0	22	0	0	0	0	0
4/13/2015	413	GSA 2	1st	B	I	Concrete Ceiling	S	White	F	0	0	0	0	0	0	0
4/13/2015	414	GSA 2	1st	D	I	Concrete Ceiling	S	White	F	0.02	0	0	0	0	0	0
4/13/2015	415	GSA 2	1st	D	I	Concrete Ceiling	S	Off-White	F	0	0	0	0	0	0	0
4/13/2015	416	GSA 2	1st	D	I	Concrete Ceiling	S	Mint Green	F	0	1.1	0	0	24	0	0
4/13/2015	417	GSA 2	1st	H	I	Concrete Ceiling	S	White	F	0	0	0	0	0	0	0
4/13/2015	418	GSA 2	1st	J	I	Concrete Ceiling	S	Mint Green	F	0.08	7	8.4	102	29	0.6	0
4/13/2015	419	GSA 2	1st	J	I	Concrete Ceiling	S	White	F	0	0	0	124	0	0	0
4/13/2015	420	GSA 2	1st	Q	I	Concrete Ceiling	S	Tan	F	0	0	0	52	0	0	0
4/13/2015	421	GSA 2	1st	R	I	Concrete Ceiling	S	Tan	F	0	0	0	102	0	0	0
4/14/2015	386	GSA 2	Basement	A	I	Concrete Ceiling	S	Gold	F	0.04	194	17.9	101	16	0	0
4/14/2015	387	GSA 2	Basement	A	I	Concrete Ceiling	S	Black	F	0	0	0	47	0	0	0
4/14/2015	388	GSA 2	Basement	A	I	Concrete Ceiling	S	Tan	F	0	59	0	139	0	0	0
4/14/2015	389	GSA 2	Basement	A	I	Concrete Ceiling	S	White	F	0	12.8	0	112	0	0	0
4/14/2015	390	GSA 2	Basement	A	I	Concrete Ceiling	S	Tan	F	0	22	0	13	0	0.11	0
4/14/2015	391	GSA 2	Basement	B	I	Concrete Ceiling	S	Off-white	F	0	0	0	44	0	0	0
4/14/2015	392	GSA 2	Basement	B	I	Concrete Ceiling	S	White	F	0	0	0	140	0	0	0
4/14/2015	393	GSA 2	Basement	C	I	Concrete Ceiling	S	White	F	0	0	0	49	0	0	0
4/14/2015	394	GSA 2	Basement	C	I	Concrete Ceiling	S	White	F	0	0	0	0	0	0	0
4/14/2015	395	GSA 2	Basement	C	I	Concrete Ceiling	S	Off-white	F	0	0	0	0	0	0	0
4/14/2015	396	GSA 2	Basement	C	I	Concrete Ceiling	S	White	F	0	0	0	120	0	0	0
4/14/2015	397	GSA 2	Basement	C	I	Concrete Ceiling	S	Tan	F	0	0	0	126	0	0	0
4/14/2015	398	GSA 2	Basement	D	I	Concrete Ceiling	S	Tan	F	0	0	0	70	0	0	0
4/14/2015	399	GSA 2	Basement	D	I	Concrete Ceiling	S	Black	F	0	0	0	0	0	0	0
4/14/2015	400	GSA 2	Basement	F	I	Concrete Ceiling	S	Tan	F	0	0	0	0	0	0	0
4/14/2015	401	GSA 2	Basement	E	I	Concrete Ceiling	S	Off-white	F	0	48	0	0	0	0	0
4/14/2015	402	GSA 2	Basement	E	I	Concrete Ceiling	S	Mint Green	F	0	80	5.9	148	48.3	0	0
4/14/2015	403	GSA 2	Basement	E	I	Concrete Ceiling	S	Tan	F	0	3.7	0	0	0	0	0
4/14/2015	404	GSA 2	Basement	E	I	Concrete Ceiling	S	Off-white	F	0	10.1	0	0	0	0	0
4/14/2015	405	GSA 2	Basement	E	I	Concrete Ceiling	S	Off-white	F	0	2.1	0	18	0	3	0.11

Date	Test #	Building #	Section & Floor	Location	Int (I) Ext (E)	Substrate	Rough (R) Smooth (S)	Color	Type Gloss (G) Flat (F)	As (ppm)	Ba (ppm)	Cd (ppm)	Cr (ppm)	Hg (ppm)	Se (ppm)	Ag (ppm)
4/14/2015	406	GSA 2	Basement	F	I	Concrete Ceiling	S	Off-white	F	0	0	0	177	0	0	0
4/14/2015	407	GSA 2	Basement	F	I	Concrete Ceiling	S	Black	F	0	0	0	0	0	0	0
4/14/2015	408	GSA 2	Basement	F	I	Concrete Ceiling	S	Tan	F	0	0	0	0	0	0	0
4/14/2015	409	GSA 2	Basement	F	I	Concrete Ceiling	S	White	F	0.09	0	0	197	0	0	0
4/3/2015	1	GSA 3		L1	I	Cement Block Wall	R	White	F	0	0	0	79	0	0	0
4/3/2015	2	GSA 3		L2	I	Cement Block Wall	R	Baby blue	F	0	16	7.7	56	0	0	0
4/3/2015	3	GSA 3		L3	I	Cement Block Wall	R	Yellow	F	0	0	0	0	0	0	0
4/3/2015	4	GSA 3		L4	I	Cement Block Wall	R	Tan	F	0	0	0	105	0	0	0
4/3/2015	5	GSA 3		L5	I	Cement Block Wall	R	Light Grey	F	0	0	0	78	0	0	0
4/3/2015	6	GSA 3		L6	I	Cement Block Wall	R	Tan	F	0	8.7	0	134	0	0	0
4/3/2015	7	GSA 3		L7	I	Cement Block Wall	R	Tan	F	2.2	90	16	90	24	2	0.14
4/3/2015	8	GSA 3		L8	I	Cement Block Wall	R	Off-White	F	0	0	0	120	0	8.7	0.38
4/3/2015	9	GSA 3		L9	I	Cement Block Wall	R	Light Pink	F	0	0	0	0	0	0	0
4/3/2015	10	GSA 3		L10	I	Cement Block Wall	R	Tan	F	0	1.2	0	146	0	0	0
4/3/2015	11	GSA 3		L11	I	Cement Floor	S	Grey	F	0	0	0	0	0	0	0

Brandenburg® Industrial Service Company
2625 S. Loomis
Chicago, IL 60608
Phone (312) 326-5800
FAX (312) 326-5055

NON-CONTAMINATED MATERIALS TO BE RECYCLED/REUSED

Brandenburg® Industrial Service Company
2625 S. Loomis
Chicago, IL 60608
Phone (312) 326-5800
FAX (312) 326-5055

Brandenburg®

www.Brandenburg.com

	Cubic Yards	Tons
Above Ground Concrete	166,975	333,950
Masonry / Block	88,082	117,149
Floor Slab Concrete	120,398	240,797
Foundations	61,166	122,331
Asphalt		3,533,415 (sq ft)
Steel		26,817
Rebar		8,425
Insulated Wire		589
Copper Buss / Tube / Piping		166
Transformer Cores		165
Stainless		112
Misc Non-Ferrous		858
C&D/Garbage/Roofing Material		46,987

Brandenburg® Industrial Service Company
2625 S. Loomis
Chicago, IL 60608
Phone (312) 326-5800
FAX (312) 326-5055

Brandenburg®

www.Brandenburg.com

UTILITY EXCAVATION SUMMARY

Brandenburg® Industrial Service Company
2625 S. Loomis
Chicago, IL 60608
Phone (312) 326-5800
FAX (312) 326-5055

Brandenburg®

www.Brandenburg.com

Individual Utility Trenches			Haz Volume CY	Non-Haz Volume	Reuse Volume
Utility Trench	Cubic Feet	Cubic Yards	Cu Yd	Cu Yd	Cu Yd
Argon	753.23	27.90	0	0	28
CO2	3,720.65	137.80	0	0	138
Compressed Air	14,302.54	529.72	0	0	530
Electic	370,726.86	13,730.61	0	0	13,731
Fire Protection	280,727.13	10,397.29	0	0	10,397
Industrial Waste	100,212.45	3,711.57	412	825	2,474
Natural Gas	170,859.61	6,328.13	0	0	6,328
Nitrogen	4,729.87	175.18	0	0	175
Propane	9,342.10	346.00	0	0	346
Sanitary	512,544.48	18,983.11	2,109	4,218	12,655
Steam	53,596.61	1,985.06	0	0	1,985
Storm	4,765,588.40	176,503.10	19,611	39,223	117,669
Telephone	91,328.50	3,382.53	0	0	3,383
Water	308,280.67	11,417.79	0	0	11,418
Totals:	6,686,713.10	247,655.79	22,133	44,266	181,257

Brandenburg® Industrial Service Company
2625 S. Loomis
Chicago, IL 60608
Phone (312) 326-5800
FAX (312) 326-5055

Brandenburg®

www.Brandenburg.com

BANNISTER FEDERAL COMPLEX DEMOLITION PLAN: WASTE OPERATIONS MANUAL

1.0 INTRODUCTION

The wastes that will be generated at the Bannister Federal Complex (BFC) were well characterized with many existing sample results to aid in handling and disposal. This Waste Operations Manual (WOM) describes the procedures to identify, characterize, and handle wastes associated with the decontamination and demolition of the BFC. This plan is designed as a guide for use by site personnel to provide consistent and compliant procedures for wastes generated and managed as part of the BFC decontamination and demolition. This plan is intended as a guide to waste management operations, and assumes that supervisory personnel have a working knowledge of applicable state and federal regulations associated with waste characterization, handling, and disposal.

This document may not cover all situations that may arise. If unforeseen situations arise during the implementation of this program, the Project Manager will be contacted for direction prior to proceeding with work.

1.1 OBJECTIVES

In providing a consistent framework for the management of waste materials, this plan will support the following objectives:

- Prevent mischaracterization of waste that could lead to improper handling and disposal
- Determination of appropriate waste disposal sites (Subtitle C, Subtitle D, etc)
- Minimize the quantity of wastes generated that are classified as hazardous
- Maximize the amount of material that can be reused, recycled, or disposed of on site
- Prevent accidental releases of contaminated media
- Comply with applicable regulations regarding waste handling and disposal
- Is contaminated by waste from non-specific sources that meet the requirement of F-listed hazardous waste

1.2 CLARIFICATIONS

Throughout this Plan, the term “hazardous waste” is used only in reference to waste which meets the Resource Conservation and Recovery Act (RCRA) definition of hazardous waste. This term should not be confused with the more general term of “hazardous material” which encompasses many different materials. In general, a material will only be characterized as hazardous waste once it is intended for disposal and can be definitively characterized based on its location and/or analytical testing has confirmed it has one of the following properties:

- Ignitibility

- Corrosivity
- Toxicity
- Is contaminated by commercial grade, unused product thereby meeting the definition of a U-listed hazardous waste.

1.3 APPLICABLE REGULATIONS, REQUIREMENTS, AND GUIDANCE

The on site management and offsite disposal of wastes generated during the project are subject to federal, state, and local regulations. This WOM was developed to comply with applicable regulations and requirements, as well as to comply with terms and conditions of the applicable site permits.

The following regulations and permits are potentially applicable to waste management during decontamination and demolition activities at the BFC:

- 40 CFR Parts 260-265, 268, 273, and 279 federal regulations concerning hazardous waste; land disposal restrictions; universal waste; and used oil, respectively.
- 40 CFR 761.40(a)(1); 761.50 and 761.60(b)(2)(ii) regarding polychlorinated biphenyls (PCBs).
- 49 CFR Parts 172, 173 federal regulations concerning the preparation of hazardous materials for shipment, including marking, labeling, and placarding of containers; and shipping papers.
- 10 CSR 25-4.261 - Methods for Identifying Hazardous Waste
- 10 CSR 25-5.262 - Standards Applicable to Generators of Hazardous Waste
- 10 CSR 25-6.263 - Standards for Transporters of Hazardous Waste
- 10 CSR 25 7.264 - Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities
- 10 CSR 25-7.265 - Interim Status Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities
- 10 CSR 25-7.266 - Standards for the Management of Specific Hazardous Wastes and Specific Types of Hazardous Waste Management Facilities
- 10 CSR 25-7.268 - Land Disposal Restrictions
- 10 CSR 25-7.270 - Missouri Administered Permit Programs: The Hazardous Waste Permit Program

- 10 CSR 25-8.124 - Public Participation
- 10 CSR 25-9.020 - Hazardous Waste Resource Recovery Processes
- 10 CSR 25-11.279 - Recycled Used Oil Management Standards
- 10 CSR 25-12.010 - Fees and Taxes
- 10 CSR 25-13.010 - Polychlorinated Biphenyls
- 10 CSR 25-16.273 - Standards for Universal Waste Management
- 10 CFR 31 – General Domestic Licenses for Byproduct Material
- Missouri State Operating Storm Water Permit (MO-0004863)

1.4 INTEGRATION WITH OTHER PLANS

The work being performed at the BFC is multi-faceted, and the WOM represents one of several interrelated plans and reports that work integrally with the WOM, including:

- *Demolition Health and Safety Plan* - Describes health and safety procedures that apply to site activities. All personnel handling waste must follow the procedures described in the health and safety plan.
- *Facility Environmental Assessment (FEA) Work Plan* - Describes procedures for characterizing building materials for demolition and disposal. Procedures may be applicable to characterization of wastes for handling and disposal purposes.
- *Facility Environmental Assessment (FEA) Report* - Summarizes findings of the FEA. Identifies areas of impacted building materials, and provides an inventory of universal wastes that are present on site; provides baseline characterization of demolition debris for areas that are outside of Solid Waste Management Units (SWMUs) and Areas of Concern (AOCs).
- *Spill Prevention Control and Countermeasures Plan (SPCC)* - Describes procedures for proper storage and handling of petroleum products at the BFC. The procedures in this plan must be followed when handling and storing petroleum wastes.
- *Storm Water Pollution and Prevention Plan (SWPPP)* - provides procedures to control erosion and discharge of sediment to surface water as a result of soil disturbance and demolition activities. Procedures in this plan will be followed for stockpiled wastes.
- *Demolition Work Plan* - Will provide specific means and methods, and requirements for disposal of demolition debris on concrete slabs at BFC.

Brandenburg® Industrial Service Company
2625 S. Loomis
Chicago, IL 60608
Phone (312) 326-5800
FAX (312) 326-5055

2.0 ANTICIPATED WASTE MATERIALS

The following subsections describe the various waste materials that are anticipated to be encountered during the demolition and remediation of the BFC.

2.1 ASBESTOS

ACM is present throughout the BFC. The majority of the asbestos will be removed prior to the overall demolition by properly licensed and trained personnel under direct supervision of Brandenburg. Only residual ACM will remain.

Residual ACM such as gaskets will be considered waste when removed during the abatement process. For the purpose of this Plan, ACM waste shall include all disposable, non-reusable items from the asbestos-abatement containment area, including personal protective equipment, plastic sheeting, and tape.

2.2 CHEMICAL RESIDUAL

BFC has had most bulk chemicals removed from the BFC prior to abatement and demolition. Tanks, vessels, and lines may have been emptied, flushed, and drained. Drums have been removed from the site. Consequently, residual chemicals are not expected to be encountered in significant quantities during abatement and demolition; however, it is possible that small volumes of residual chemicals may be encountered in some lines and vessels when they are opened. Drums, totes, and other small containers of chemicals may also be encountered as a result of disposition of the BFC. Residual chemicals may be present in either solid or liquid form.

Bulk chemical residuals are considered wastes when they are removed from process tanks and lines. Chemicals stored in other containers are considered wastes when they have been identified as no longer having potential for use at the BFC.

Residual process chemicals found in vessels, tanks and lines should be identifiable based on their location and use of the tank figures and inventory located in the SPCC and additional evaluation of field mechanical systems by Lutjen Inc. Stored chemicals that are in labeled containers will be characterized based on these labels. Chemicals that cannot be identified in one of these manners will need to be sampled and analyzed for characterization. Some of the process chemicals can become characteristic hazardous waste as a result of ignitibility, corrosivity toxicity, or listed waste determination. None of the process chemicals exhibit the characteristic of reactivity. Residuals of process chemicals may be characterized as hazardous wastes if they clearly originate from sources where these chemicals were released in their commercial grade form, such as spills immediately next to tanks previously used to store these chemicals.

Water that accumulates in vessels, tanks, and lines that were once used to contain process chemicals, and have not been decontaminated, will be handled as chemical residual. Chemical residual may be characterized as hazardous waste, characteristic hazardous or non-hazardous waste.

2.3 USED OIL

"Used Oil" is any oil that has been refined from crude oil, or any synthetic oil, that has been used and as a result of such use is contaminated by physical or chemical impurities. Examples of potential "Used Oil" at the BFC include:

- Used motor oil
- Used hydraulic oil
- Used turbine oil
- Used pump lubricating oil
- Oil inside transformers.

Virgin oil tanks have been emptied and cleaned. Although unlikely, if a tank or heel of virgin oil (e.g. #6 Fuel oil and #2 Fuel oil) is discovered, it will not be regulated as "Used Oil". For the purpose of this Plan, virgin oil is not considered a waste. Virgin oil may be accumulated for future use. A figure describing the former storage locations of virgin oil is included in the current SPCC.

Mixtures of used oil and fuel are not regulated as "Used Oil" if the generator still intends to use the mixture in the one of the generator's own engines. If these mixtures are collected to be burned for energy recovery, the mixtures are regulated as "Used Oil". If these mixtures are collected for disposal or recycling in some way other than burning for energy recovery, then the mixture will be analyzed for waste characterization (Section 3.0).

Oil derived from animals or vegetables is not considered "Used Oil". Finish oil derived from animals and vegetables was applied to fiber as a lubricant in passage through offsite processing equipment. This finish oil, therefore, is not considered "Used Oil". A figure describing the locations where fuel oil and finish oil were handled and stored is included in the SPCC. Used finish oil is considered a miscellaneous recyclable (Section 2.7). Virgin finish oil is to be accumulated for future use (Section 6.0).

Used Oily Debris

Used oil filters, oily rags and oil spill clean-up materials are considered used oil debris. Used oil debris will be assumed to be non-hazardous waste, unless the source of the debris can be verified as a hazardous waste, or there are analytical data available for characterization.

2.3.1 Hazardous Waste and Suspected Hazardous Waste

In the unlikely event that any oil is mixed with a "listed hazardous waste" (40 CFR 261.31-.33), the entire resulting mixture becomes a listed hazardous waste.

If any oil is mixed with a waste that is hazardous by characteristic, and not a listed waste, then the mixture will be assumed hazardous, until analyzed for characterization (Section 3.0). Examples of characteristic hazardous wastes that might become mixed with oil include mineral spirits and Stoddard Solvent.

Used oil may also be mixed with spent antifreeze, which can contain constituents such as benzene or lead that would impart the toxicity characteristic. Mixtures of oil and antifreeze will be assumed to be hazardous waste unless additional characterization is completed(Section 3.0).

If an oil container is labeled as “hazardous waste”, and accompanied by a waste profile, the existing information will be sufficient to characterize the oil as hazardous waste. If an oil container label indicates the presence of listed hazardous waste, the existing information will also be sufficient to characterize the oil as hazardous waste. If the origin of any oil is unknown, it will be assumed to be hazardous, unless analyzed for characterization (Section 3.0).

2.3.2 PCB-Containing and Suspected PCB-Containing

PCB-containing oils were historically used as a dielectric in high voltage transformers, and as a hydraulic fluid and lubricant in equipment that operated at high temperatures. BFC has a history of PCB use in their processes or process equipment, and identified only two PCB-containing transformers at the BFC that have been emptied and removed. Sampling performed during the FEA identified low concentrations of PCBs in concrete from areas where equipment maintenance was performed, which suggests some minor historical use of equipment with PCB-containing oils. The facility was in operation at the time of the FEA, and it was not possible to sample elevator systems. Because of the potential for historical PCB usage, used oil from elevator hydraulic systems and unidentified sources will be tested for PCBs (Section 3.0) unless documentation and labeling makes it clear there are no PCBs present.

There are a number of non-PCB transformers still in place at the BFC. A figure describing the locations of BFC transformers is included in the most current SPCC. Unless documentation makes it clear that the transformers are non-PCB transformers, the oil within these transformers will be tested for PCBs.

2.3.3 Non-hazardous

Used oil will be characterized as “non-hazardous” if none of the conditions described in Sections 2.3.1 or 2.3.2 apply. Used oil will be characterized as non-hazardous if it comes from a known, nonhazardous and PCB-free origin; such as:

- Motor oil inside of an engine
- Hydraulic oil inside a piston (other than elevator systems)
- A drum labeled Used Turbine Oil
- Oil inside a pump casing.

Brandenburg® Industrial Service Company
2625 S. Loomis
Chicago, IL 60608
Phone (312) 326-5800
FAX (312) 326-5055

2.4 UNIVERSAL WASTE

An inventory of universal waste was performed as part of the *Facility Environmental Assessment (FEA)*. The FEA provides a summary of the types of universal waste observed at the BFC and their distribution across the site. A variety of universal wastes may be encountered at the BFC as described in the sections that follow.

2.4.1 Batteries

Lead acid batteries are to be sent offsite to be reclaimed and, therefore, are not classified as hazardous waste and do not fall under the universal waste rule. For the purposes of this Plan, lead acid batteries are considered a miscellaneous recyclable (Section 2.8).

Certain battery types (e.g., alkaline, silver oxide, zinc carbon, lithium-ion and nickel metal hydride) are not classified as hazardous wastes, and do not fall under the universal waste rule. For the purposes of this plan, these batteries are also considered miscellaneous recyclables (Section 2.8).

Other batteries found at the BFC which contain mercury or cadmium will be handled and disposed of as universal waste. Examples of the different types of batteries to be handled as universal waste include nickel cadmium and mercuric oxide.

2.4.2 Pesticides

Most pesticides have been removed from the site. Pesticides are any substance or mixture of substances intended for preventing, destroying, repelling, or mitigating pests. Pesticides were not manufactured or used in processes at the BFC and their use at the facility would have been incidental for grounds keeping and pest control purposes. Bulk storage of pesticides is not anticipated, and the most likely occurrence would be small containers or drums located in maintenance buildings or closets.

2.4.3 Mercury-Containing Equipment

Mercury-containing equipment (MCE) are devices or parts of devices (excluding batteries and lamps) that contain elemental mercury integral to its function. Examples of MCE include mercury thermostats, mercury switches/relays, mercury flame sensors, mercury safety valves, manometers and thermometers.

2.4.4 Lamps

Examples of the different types of lamps often used include fluorescent, high intensity discharge (e.g. metal halide), neon, mercury vapor, high pressure sodium, and incandescent. Lamps, other than incandescent, will be handled and disposed of as universal waste.
Incandescent lamps may be disposed as solid waste.

2.5 ELECTRONIC WASTE

Electronic waste is defined as anything with a circuit board or Cathode Ray Tube (CRT). Examples of devices housing circuit boards include smoke detectors, PC towers, keyboards, computer mouse and control room computers. Examples of devices housing CRTs include projection computer monitors and projection televisions.

Electronic components may contain ACM. If an electronic component contains suspected or confirmed ACM and this ACM is not removed from an electronic device, the entire device will be identified as ACM (Section 2.1).

In addition to circuit boards and batteries (section 2.4.1), ionizing smoke detectors may also contain detection chambers that contain Americium-241, which is a radioactive material. Missouri does not regulate the handling and disposal of smoke detectors, but recommends that they be returned to the manufacturer for proper disposal or recovery of the radioactive material.

2.6 EXIT SIGNS

Self-illuminating EXIT signs may contain the radioactive gas tritium. The Nuclear Regulatory Commission (NRC) regulates the handling and disposal of radioactive material. These signs may be marked with a radioactive symbol or have language that states “Caution – Radioactive Materials” and do not require electricity or batteries. The tritium gas is contained in sealed tubes lined with a light-emitting compound that gives off low-energy beta radiation that causes the lining to glow. Self-illuminating EXIT signs will be removed prior to demolition and returned to the manufacturer.

2.7 BALLASTS

Ballasts associated with lighting systems may contain PCBs. Ballasts that are not labeled “No PCBs” will be assumed to contain PCBs. Ballasts labeled “No PCBs” do not contain PCBs, and can be recycled and handled as non-PCB, unless they are leaking, in which case they will be managed as PCB waste.

2.8 DEMOLITION DEBRIS

Demolition debris will consist mainly of structural and building materials such as concrete, bricks, CMU, asphalt, glass, fiberglass insulation, roof materials, drywall, tiles, carpet and wood. ACM and scrap metal are not considered demolition debris.

Material destined to become demolition debris was sampled and characterized as part of the FEA. The FEA focused on characterizing concrete, CMU, acid brick, and structural facing brick. Samples were collected from these materials both in areas where there was evidence of impact (staining, pitting, odors, etc.) as well as from random locations selected to characterize materials with no obvious chemical impact. The FEA Report characterizes the tested materials into the following categories:

- Hazardous Wastes

  - Toxicity Characteristic Leaching Procedure (TCLP) results indicate these materials exhibit the characteristic of toxicity. Two areas were identified as hazardous waste.
- Materials impacted with greater than 1 mg/kg PCBs
  - Multiple areas were identified as impacted with greater than 1 mg/kg PCBs. Areas under transformers could not be assessed while transformers were still in use. These areas will be assumed impacted unless separately characterized during demolition.
- Non-hazardous Wastes
  - These materials were either impacted by less than 1 mg/kg PCBs or other constituents at concentrations below levels that would characterize the materials as hazardous waste. These materials are further defined as either contaminated or inert. Contaminated materials are those that have constituent concentrations that exceed beneficial reuse. These wastes will be placed on concrete slabs, or sent offsite for disposal, as opposed to inert materials, which can be used as beneficial fill.

If signs of contamination (e.g. chemical residue, paint, pitting, discoloration or odor) are observed on materials or at locations inaccessible due to BFC facility constraints, Brandenburg representatives should be consulted for additional guidance.

2.9 SCRAP METAL

Scrap metal will include items such as structural I-beams, concrete rebar, pipes, ductwork, sheet metal panels and wire. Scrap metal will include metal equipment such as radiators, railroad box and tank cars, gantry cranes, tanks, pumps and other process equipment.

Scrap metal will also include electrical transformers that have contained oil with less than 50 ppm PCBs or have never contained PCBs (Section 2.3.2). Transformers that have more than 50 ppm PCBs shall be handled as PCB-impacted waste. Transformers with between 1 and 50 ppm PCBs can be recycled at facilities that are permitted to accept these materials.

If scrap metal is considered clean, it can be recycled without restrictions and without special agreements with the recycling facility. If scrap metal has a residue that is a nonhazardous waste, it can be cleaned and recycled without special agreements, or remain unclean and be recycled with special agreements from the recycling facility. If a scrap metal has a residue that is a hazardous waste, it will remain unclean and be disposed offsite as a hazardous waste.

The following sections describe the differences between clean scrap metal, and scrap metal with residue that is nonhazardous or hazardous waste.

2.9.1 Clean Scrap Metal

The criteria for what is considered clean will be defined by the recycling facility accepting the scrap metal. Scrap metal is considered clean if it meets the following requirements:

- Contains less than the threshold quantity of nonmetallic residue specified by the recycling facility

- Is free of ACM such as asbestos containing gaskets, mastics, insulation, etc.

- Is free of thermal insulation

- Metal containers that are cleaned and without residue. Containers greater than 5 gallons will have holes cut in them and/or crushed to prevent re-use

- Is free of peeling paint, such that all remaining paint completely adheres to the metal surface.

The following clarifications are intended to minimize the labor involved in recycling scrap metal:

- Scrap metal can be considered clean if it has a raised surface which is only due to rust, not chemical process or waste residue

- Scrap metal can be considered clean if staining only discolors the surface, and is not accompanied with a residue

- Residue from utility cooling and heating streams that is non-hazardous under RCRA may remain on scrap metal sent off site for recycling if the residue is adhering to metal surfaces.

2.9.2 Scrap Metal with Residue that is Non-hazardous Waste

Examples of scrap metal with residue that is non-hazardous waste include rebar covered with uncontaminated concrete or electrical transformers coated with PCB-free oil. A scrap metal with residue will be handled as a nonhazardous waste if:

- The residue originates from a location or process where documentation indicates no use of chemicals that characterize as hazardous waste, or

- Analytical testing indicates the residue is a non-hazardous waste (Section 3.0).

2.9.3 Scrap Metal with Residue that is Hazardous Waste

Residues near previous hazardous chemicals storage tanks have the potential to be characterized as hazardous wastes. An example of a scrap metal that may have a hazardous waste residue is rebar covered with chromium laden concrete. A residue will be handled as a hazardous waste if:

- It originates from a location or process where documentation indicates use of chemicals that are characterized as hazardous waste, or

- Analytical testing indicates the residue is a hazardous waste (Section 3.0).

Scrap metal with a residue that is hazardous waste will be containerized and transported offsite for disposal.

2.10 MISCELLANEOUS RECYCLABLES

Miscellaneous recyclables include used finish oil, lead acid batteries and certain types of batteries such as alkaline and carbon-zinc cells that have been manufactured without mercury.

2.11 SUSPECT SOIL AND SEDIMENT

Visibly impacted or malodorous soils and sediment removed for closure and demolition will be analyzed for waste characterization after discussion with Brandenburg representatives (Section 3.0). Visible indications of contamination include obvious chemical residue, staining, and discoloration. Petroleum or chemical odors are also indications of contamination. Contamination may be detected at the surface of environmental media, or after the subsurface is exposed during the removal of building materials and equipment. Examples of environmental media that may have signs of contamination are gravel in the process area and soil near drum pads and storage areas.

Environmental media may be suspected of contamination based on its location in relation to historical processes. Sediment accumulated in certain sumps, pits, piles and stormwater trenches with known exposure are examples of suspect environmental media. As with the suspected contaminated soil, the handling and sampling of any material found in these areas will be discussed with Brandenburg representatives prior to removal.

2.12 CLEARING AND GRUBBING WASTE

Clearing waste is typically generated by removing and disposing of trees under 6 inches in diameter, vegetation, or other unwanted materials from the ground surface. Grubbing waste consists of the same materials as clearing waste, but originates from below the ground surface. If clearing or grubbing waste is removed from potentially impacted areas, sampling and analyses may be required for waste characterization (Section 3.0).

2.13 WASTEWATER

Small volumes of wastewater may be generated as a result of breaking pipelines and decontaminating building materials and equipment.

Stormwater may accumulate in secondary containments, sumps or depressions created during demolition. Stormwater will be handled following the requirements of the Storm Water Pollution Prevention Plan (SWPPP) and SPCC plans. Some stormwater may come into contact with impacted materials, in which case it may require handling as wastewater. Groundwater may accumulate in depressions created during demolition. If stormwater or groundwater must be moved from where it has accumulated, and it has visual indications of contamination (color, foam or sheen), or is in contact with contaminated material, it may be analyzed for characterization after discussion with Brandenburg representatives.

Brandenburg® Industrial Service Company
2625 S. Loomis
Chicago, IL 60608
Phone (312) 326-5800
FAX (312) 326-5055

2.14 PERSONAL PROTECTIVE EQUIPMENT

Personal protective equipment (PPE) will be used and disposed of throughout the demolition process. PPE will be considered hazardous or non-hazardous waste based solely on its use. PPE will not be analyzed. Anticipated PPE waste includes nitrile gloves, cut resistant gloves, respirator cartridges, and Tyvek suits.

Any PPE used for asbestos sampling or abatement will be characterized as ACM. PPE used in the following scenarios will be considered hazardous waste:

- Sampling material suspected or known to be hazardous waste

- Demolishing or handling materials characterized as hazardous waste or potentially hazardous waste.

PPE used in the following scenarios will be considered non-hazardous waste:

- Handling universal waste

- Demolishing or handling materials characterized as non-hazardous waste.

Brandenburg® Industrial Service Company
2625 S. Loomis
Chicago, IL 60608
Phone (312) 326-5800
FAX (312) 326-5055

3.0 WASTE CHARACTERIZATION AND ANALYSIS

Wastes are characterized in order to assign appropriate handling, storage and disposal procedures. Wastes, such as universal waste, are characterized based on visual inspection. Wastes, such as residual chemical in a labeled tank, or PCB-containing oil are characterized based on knowledge of historical processes, if documentation is available. Materials that can't be characterized visually, with documented process knowledge, or with previous analytical data will require sampling and laboratory analyses, under the direction of Brandenburg, to be characterized during the demolition phase. Once characterized, wastes will be segregated into waste types based on waste material, whether or not the waste is considered hazardous, and concentrations of contaminants. The following sections define each waste type and specify what analytical tests are required to classify each material to the appropriate waste type.

3.1 ASBESTOS

The majority of the asbestos will have been removed prior to demolition by Brandenburg. There will be some miscellaneous asbestos items that should be handled per applicable regulations.

All materials other than wood, metal, and glass have the potential to contain asbestos, and will be considered suspect, unless there are data confirming otherwise. Concrete and CMU are generally not considered suspect. Materials suspected to contain asbestos will be assumed to be asbestos, and handled accordingly, or sampled and analyzed for asbestos content, under the direction of Brandenburg.

Materials with an asbestos concentration >1% will be considered ACM. Materials with an asbestos concentration ≤1% will not be considered ACM.

Refer to the *Environmental Assessment* dated August 11, 2015 completed by JHF Consulting under the direction of Brandenburg for a summary of asbestos containing materials to be removed.

3.2 CHEMICAL RESIDUAL

Any remaining chemical residual will be characterized as hazardous, characteristic hazardous or nonhazardous waste. Chemical residual that cannot be identified based on labeling, or location and use of tank figures and inventory has been sampled and analyzed, under the direction of Brandenburg for characterization. Where applicable, chemical residuals will be tested for ignitibility, corrosivity, and toxicity. If waste is contaminated with these constituents, and the source of contamination was not commercial grade, then the waste is not listed. For example, a gasoline spill containing paraxylene would not be considered a U-listed waste because pure paraxylene was not mixed into the gasoline and paraxylene is not the sole active ingredient in gasoline.

Generally speaking, chemical residual will remain only in small quantities in process piping and associated tanks. Brandenburg will drain and dispose of according to the *Demolition Work Plan.*

3.3 USED OIL

Used oil will be characterized into four categories based on constituent concentrations. Used oil which cannot be identified based on historical sampling, labeling or process knowledge will be sampled and analyzed under the direction of Brandenburg to characterize it for disposal. Analytical parameters will vary, depending upon what is known regarding potential contaminants. Used oil which is part of a known mixture will be analyzed as follows:

- Oil mixed with fuel will be tested for ignitibility and toxicity
- Oil mixed with a characteristic or listed waste will be analyzed for the constituents/characteristic for which the waste was identified as hazardous
- Oil mixed with antifreeze will be tested for toxicity
- Oil mixed with PCBs will be tested for PCBs.

If the origin of a used oil is unknown, it will be analyzed for all of the parameters identified above.

Unless otherwise labeled as such, used oil will be drained from gearboxes and recycled by a third party.

3.3.1 PCB-Containing

If testing reveals oil contains PCBs at a concentration > 1 ppm, regardless of any other analytical results, it will be considered PCB-containing, and assigned to one of the following waste groups based on the concentration of PCBs measured:

- PCBs ≥ 500 ppm
- PCBs < 500 ppm.

The requirements for disposal of PCB-containing used oil varies, depending upon the concentrations identified above, and this will dictate which facilities can accept these wastes.
Oil containing PCBs at a concentration ≤ 1 ppm will not be considered PCB-containing.

3.3.2 Hazardous Waste

Used oil that does not contain PCBs, but has the characteristic of ignitability, toxicity, or that contains listed hazardous constituents, will be characterized as hazardous waste (characteristic or listed, as appropriate) and must be handled accordingly.

3.3.3 Non-hazardous Waste

Used oil which does not contain PCBs, does not exhibit the characteristic of ignitability, toxicity, and does not contain a listed hazardous constituent, will be considered non-hazardous waste and will be handled accordingly.

3.4 DEMOLITION DEBRIS

Demolition debris will be characterized into five waste categories, based on the type and degree of contamination. Results from the FEA will be adequate to assign most materials to these waste categories.

Based on characterization performed for the FEA, it appears that the majority of the materials fall into the non-hazardous category with little material qualified as inert. Consequently, uncharacterized debris will typically only require evaluation of whether or not the debris is hazardous or nonhazardous waste. Analyses of these debris will be limited to TCLP volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), metals, and if applicable, listed hazardous constituent. The characteristic of ignitability, corrosivity, and reactivity are generally not considered a concern for demolition debris, and are not analyzed unless specifically requested by the disposal facility or if there are unusual conditions that would suggest an increased hazard. Additionally, materials which are impacted with waste oil, oil from an unidentified source, or are from areas around transformers, elevators, or other potential sources of PCBs, will require analysis of PCBs.

3.4.1 PCB-Impacted

If testing reveals demolition debris contains PCBs at a concentration > 1 mg/kg, regardless of any other analytical results, it will be considered PCB-impacted, and assigned to one of the following waste groups based on the concentration of PCBs measured:

- PCBs ≥ 50 mg/kg
- PCBs < 50 mg/kg

The requirements for disposal of PCB-impacted waste vary, depending upon the concentrations identified above, and this will drive which facilities can accept these wastes. Debris containing PCBs at a concentration ≤1 mg/kg will not be considered PCB-impacted.

3.4.2 Hazardous Waste

Demolition debris that does not contain PCBs, but has the characteristic of toxicity, or that contains listed hazardous constituents will be characterized as hazardous waste (characteristic or listed, as appropriate) and must be handled accordingly.

3.4.3 Non-hazardous Waste

Demolition debris which does not contain PCBs, does not exhibit the characteristic of toxicity, and does not contain a listed hazardous constituent will be considered non-

hazardous waste. Demolition debris characterized as nonhazardous waste may be further classified as inert, based on comparison of analytical data to Missouri Department of Natural Resources Solid Waste Program Risk-based Target Levels.

3.5 SOIL AND SEDIMENT

Soil and sediment identified as suspect (Section 2.10) will be characterized into one of four waste categories based on the type and concentration of impact. These media have not been characterized and will need to be sampled and analyzed, under the direction of Brandenburg for the full list of BFC parameters unless the range of parameters can be reduced based on process or historical knowledge. In addition, soil and sediment which are impacted with used oil, oil from an unidentified source, or are from areas around transformers, elevators, or other potential sources of PCBs, will require analysis of PCBs. Brandenburg will work with CenterPoint Properties and its Subcontractors in order to determine soil and sediment characterization.

3.5.1 PCB-Impacted

If testing reveals soil or sediment contains PCBs at a concentration > 1 mg/kg, regardless of any other analytical results, it will be considered PCB-impacted, and assigned to one of the following waste groups based on the concentration of PCBs measured:

- PCBs ≥ 50 mg/kg
- PCBs < 50 mg/kg.

The requirements for disposal of PCB-impacted waste vary, depending upon the concentrations identified above, and this will drive which facilities can accept these wastes. Soil or sediment containing PCBs at a concentration ≤ 1 mg/kg will not be considered PCB-impacted.

3.5.2 Hazardous Waste

Soil or sediment that does not contain PCBs, but has the characteristic of toxicity, or that contains listed hazardous constituents, will be characterized as hazardous waste, and must be handled accordingly. If the characterization of toxicity was performed using a totals analysis, as opposed to TCLP, the medium can be resampled, using the TCLP extraction, and if the analytical results for this analysis do not exceed the toxicity characteristic, the material will be considered non-hazardous waste. The characteristic of ignitability, corrosivity, and reactivity are generally not considered a concern for soil and sediment, and are not analyzed unless specifically requested by the disposal facility or if there are unusual conditions that would suggest an increased hazard.

3.5.3 Non-hazardous Waste

Soil or sediment which does not contain PCBs, does not exhibit the characteristic of toxicity, and does not contain a listed hazardous constituent will be considered non-hazardous waste. Soil or sediment characterized as non-hazardous waste may be further

classified as inert, based on comparison of analytical data to Missouri Department of Natural Resources Solid Waste Program Risk-based Target Levels.

3.5.4 Inert

If no constituents in an analyzed sample from soil or sediment exceeds the Missouri Department of Natural Resources Solid Waste Program Risk-based Target Levels, it can be characterized as inert, and can be used as beneficial fill. If analytical results indicate constituent concentrations exceed the Risk-based Target Levels, the soil or sediment will be characterized and managed accordingly.

3.6 WASTEWATER

Wastewater that cannot be characterized with documented process knowledge, or with previous analytical data, will require sampling and laboratory analysis, under the direction of Brandenburg. Samples will be collected from each event generating wastewater, unless wastewater is bulked in a single container, in which case a sample will be collected from each container, once it is filled.

3.7 PERSONAL PROTECTIVE EQUIPMENT

Personal protective equipment will be characterized based on the materials with which it has come in contact, and handled accordingly.

Brandenburg® Industrial Service Company
2625 S. Loomis
Chicago, IL 60608
Phone (312) 326-5800
FAX (312) 326-5055

4.0 WASTE SAMPLING PROCEDURES

Samples will be collected from each waste type, as described in the sections that follow. Procedures for decontaminating sampling tools and shipping samples are also provided.

4.1 ASBESTOS

Any remaining materials suspected to contain asbestos will be sampled by a Licensed Inspector in accordance with applicable federal, local, and State of Missouri asbestos regulations.

4.2 CHEMICAL RESIDUAL

Chemical residual will be sampled only by personnel with OSHA Hazardous Waste Operations (HAZWOPER) Training.

Drums have been removed from the BFC and are not anticipated to be present. If an unlabeled drum is encountered, however, it will require sampling for characterization. Sampling of closed, unlabeled drums and other containers is extremely dangerous and sampling procedures will need to be tailored to fit the specific needs of the situation. If unlabeled drums and containers are found, the Brandenburg Project Manager will be notified, and a procedure for sampling will be developed. Under no circumstances should an unlabeled drum or container be opened or moved without contacting the Project Manager, unless it is clearly empty. Unlabeled drums or containers can be sampled if they are already open, and can be readily accessed without moving them.

Liquid chemical residual will be collected with a disposable thief, bailer, peristaltic pump with disposable tubing, or similar type of sampler. Each liquid sampler will be used only once, and then discarded along with PPE. Liquid samples will be decanted directly into laboratory-supplied sample containers.

Solid chemical residual will be collected with stainless steel tools and thoroughly mixed in stainless steel mixing bowls before being placed into laboratory-supplied sample containers. Stainless steel tools shall be decontaminated (Section 4.7) prior to each sample. Solid samples may also be collected with disposable plastic implements and placed directly into laboratory-supplied sample containers. Disposable plastic implements will be used only once, and discarded along with PPE.

4.3 USED OIL

Used oil will be sampled following the same procedures as for liquid chemical residual (Section 4.2).

4.4 DEMOLITION DEBRIS

The majority of the material destined to become demolition debris was sampled and characterized as part of the FEA. Materials sampled and given the following characterizations, during the FEA, will not be resampled:

- Materials impacted with greater than 50 mg/kg PCBs
- Materials impacted with greater than 1 mg/kg PCBs but less than 50 mg/kg PCBs
- Hazardous wastes
- Non-hazardous wastes

Building materials can be sampled in place, from debris piles, or containers following removal. The objective with sampling of demolition debris will be to collect a composite sample of concrete, CMU, brick or asphalt that is representative of the bulk material. This will be accomplished by collecting multiple aliquots of roughly equal size, from multiple locations throughout the material to be characterized. These aliquots will be collected from locations selected to characterize the range of conditions within the material, and should include multiple locations and depths distributed across the material. Sample aliquots will be collected with a decontaminated hammer, chisel, or impact hammer to break the material into similar sized pieces. If there are obvious variations in the condition of the material (such as obvious indicators of chemical impact, weathering, or changes in the type of material), aliquots should be collected to proportionately represent these variations. Once collected, aliquots will be collected in a decontaminated (Section 4.7) stainless steel mixing bowl, and thoroughly mixed. The analytical sample will then be collected from the composite material, and placed directly into a laboratory-supplied sampling container.

4.5 WATER

Wastewater generated by breaking pipelines and decontaminating building materials and equipment that cannot be characterized with documented process knowledge, or with previous analytical data, will require sampling and laboratory analysis to be characterized. Agreement with Brandenburg representatives is required to sample and analyze stormwater and groundwater for characterization. Water will be sampled following the same procedures as for liquid chemical residual (Section 4.2).

4.6 SAMPLING TOOLS DECONTAMINATION

Non-dedicated sampling equipment (e.g., trowels, chisels, scrapers, bowls, etc.) will be decontaminated before use and between each sample. Decontamination will consist of the following steps:

1) Wipe off excess material with paper towels
2) Wash with Alconox® and potable water
3) Rinse with distilled water
4) Rinse with D-Limonene
5) Rinse with distilled water

Equipment not being immediately reused will be wrapped in clean aluminum foil.

4.7 SAMPLE SHIPMENT

Samples of asbestos will be evaluated by a Missouri licensed and accredited inspector and packed in sealed sample bags, labeled, and sent to the laboratory for analysis. Samples of other media will be placed in appropriate laboratory-supplied containers, labeled, and placed on ice pending shipment to the analytical laboratory. Sample shipments will include a chain of custody form, and additional ice and packing material, as necessary. Additional information regarding sample shipment and handling can be found in the *Facility Environmental Assessment Work Plan.*

Brandenburg® Industrial Service Company
2625 S. Loomis
Chicago, IL 60608
Phone (312) 326-5800
FAX (312) 326-5055

5.0 WASTE CONTAINMENT AND LABELING

Once a waste has been generated, it must be contained and labeled in a manner consistent with its characterization or anticipated characterization (if laboratory analyses are pending). The following sections describe waste containment and labeling requirements by waste type.

5.1 ASBESTOS

ACM and suspect ACM should not be handled by anyone other than trained and licensed individuals. ACM waste shall be packaged in two layers of 6-mil plastic sheeting and sealed with duct tape or double 6-mil bags and/or leak tight drums sealed individually with duct tape. Bags shall be clearly marked with factory printed labels and wrapped ACM will be identified with adhesive labels identifying the waste as asbestos (Section 5.12). Waste bags shall be moved from the work area to the transport containers via trash cart or manual means. The transport container shall be lined with two layers of 6-mil plastic sheeting prior to the placement of ACM waste inside. Containers will have a covered top (e.g., lid or tarp) while not being loaded. The top of the containers will be sealed with two layers of 6-mil poly prior to transport. Filled and labeled containers will be transported to a designated storage area (Section 6.0).

If an ACM is contaminated with hazardous waste, it will be handled and contained as above, but separately from other ACM. It will be labeled accordingly (Section 5.12) and transported to a designated storage area (Section 6.0).

5.2 CHEMICAL RESIDUAL

Any remaining chemical residual will be removed from vessels, tanks, and lines, and placed in suitable containers (vacuum trucks, drums, totes or frac tanks, as appropriate). Prior to placing the residual in a container, it will be necessary to verify that the container is compatible with the chemical. To prevent potential incompatibility issues, chemical residues of different types will not be placed in the same containers. Wastes placed in drums, totes or frac tanks will be labeled as appropriate (Section 5.12), and transported to a designated accumulation area (Section 6.0). Drums or totes that are in poor condition will be overpacked, or their contents will be transferred to a new container, prior to transport to an accumulation area. Drums and totes transported offsite must meet Department of Transportation (DOT) requirements.

5.3 USED OIL

The four different used oil waste types (hazardous, non-hazardous, PCB-impacted, or inert) will not be mixed. Used oil will be placed in suitable containers (vacuum trucks, drums, totes or frac tanks, as appropriate), labeled (Section 5.12), and may be transported to a designated accumulation area (Section 6.0) or offsite for disposal, as appropriate. Prior to placing the used oil in a container, it will be necessary to verify that the container is compatible with that material.

5.4 UNIVERSAL WASTE

Universal wastes will be placed in containers and labeled based on waste type as discussed in the following.

5.4.1 Batteries

Smaller batteries characterized as universal waste will be placed in United Nations (UN)-approved drums or buckets. Separate containers will be used for different types of batteries. Nickel-cadmium, lithium, and all non-mercury containing batteries can be stored together. Mercury oxide, and all other mercury-containing batteries, can also be stored together. All batteries must have their terminals covered with electrical tape or placed in individual bags. Packing material, such as bubble wrap or styrofoam, will not be used. Battery containers will be labeled as appropriate (Section 5.12) and transported to a designated accumulation area (Section 6.0). Batteries too large to place in containers will be labeled, and stored on pallets. Batteries placed on pallets will not be stacked.

Batteries not considered Universal Waste, such as sealed lead acid, alkaline, and carbon-zinc batteries will be segregated each into its own containers, labeled as appropriate (Section 5.12) and transported to a designated accumulation area (Section 6.0). Batteries too large to place in containers will be labeled and stored on pallets. Batteries placed on pallets will not be stacked.

5.4.2 Pesticides

Pesticides are to remain in their original packaging and placed in buckets or drums dedicated to pesticides. These buckets or drums are to be labeled as appropriate (Section 5.12) and transported to a designated accumulation area (Section 6.0).

5.4.3 Mercury-Containing Equipment

Mercury containing equipment will be accumulated in a sealed UN-approved bucket or drum. The container must be designed to prevent the escape of mercury into the environment by volatilization or any other means. Absorbent shall be included in the bucket or drum to collect potential leaks. Mercury-containing ampoules maybe removed from the equipment they are in and transferred to an appropriate container. Mercury waste buckets or drums are to be labeled as appropriate (Section 5.12) and transported to a designated accumulation area (Section 6.0).

5.4.4 Lamps

High intensity discharge lamps shall be placed in fiber drums, large enough to contain the lamps, and accumulated separately from all other lamps. All other lamps shall be placed in containers that are structurally sound, adequate to prevent breakage, and compatible with the content of the lamps.

Lamps broken unintentionally may still be managed as universal waste, but must be packaged to prevent releases. If a broken lamp is mixed with other debris, a determination must be made as to whether or not the mixture is hazardous waste. Intentional crushing

of hazardous waste lamps is considered treatment of hazardous wastes and shall not be performed.

Lamp containers are to be labeled as appropriate (Section 5.12) and transported to a designated accumulation area (Section 6.0).

5.5 ELECTRONIC WASTE

MODNR regulations ban televisions, computers, monitors, printers, scanners and computer peripherals such as keyboards and mice from disposal in landfills. Therefore, all electronic waste is to be recycled off site. Recycled electronic waste is not considered solid or hazardous waste under RCRA. Electronic waste will be placed in a covered container (roll-off, dumpster, drum, etc), dedicated to electronic waste, labeled as appropriate (Section 5.12) and transported to a designated accumulation area (Section 6.0).

5.6 EXIT SIGNS

Self-illuminating EXIT signs must be removed prior to demolition. The United States Nuclear Regulatory Commission (NRC) regulations state proper handling and disposal requirements for these signs. All self-illuminating signs or signs that have the applicable labels to designate them as potentially radioactive will be removed from their mount intact, labeled as appropriate (Section 5.12) and transported to a designated accumulation area (Section 6.0).

5.7 BALLASTS

Ballasts containing PCBs and leaking ballasts (PCB and non-PCB) will be managed as PCB waste. Leaking ballasts shall be segregated from non-leaking and stored in sealed containers labeled as PCB containing (Section 5.12). Adequate absorbent material shall be placed in containers of leaking ballasts to prevent the accumulation of free standing liquid. Non-leaking “No PCBs” ballasts shall be segregated from the ballasts described above. All ballast containers will be transported to a designated accumulation area (Section 6.0).

5.8 DEMOLITION DEBRIS

Demolition debris will be segregated based on waste type as described in the following:

5.8.1 PCB-Impacted

Demolition debris that is PCB-impacted will be segregated based on the total PCB concentration, may be placed in sealed containers, labeled as PCB-impacted (Section 5.12), and transported to a designated accumulation area (Section 6). Bulk PCB-impacted demolition debris may also be loaded directly onto trucks or rail cars for disposal.

5.8.2 Hazardous Waste

Demolition debris that is hazardous waste will be segregated, placed in sealed containers, labeled as hazardous waste (Section 5.12), and transported to a designated accumulation area (Section 6). Bulk hazardous waste may also be loaded directly onto trucks or rail cars for disposal.

5.8.3 Non-hazardous Waste

Demolition debris that is characterized as nonhazardous Waste will be segregated, placed in sealed containers, or accumulated on concrete slabs, or the ground surface immediately adjacent to the concrete slab from which it came. Bulk demolition debris that is non-hazardous waste can be transported in bulk and placed on another concrete slab, but will not be placed on the ground surface anywhere other than immediately adjacent to the structure from which it was derived. Bulk non-hazardous waste may also be loaded directly onto trucks or rail cars for disposal. If placed in containers, the containers will be labeled (Section 5.12), and transported to a designated accumulation area (Section 6).

5.8.4 Inert

Demolition debris that is characterized as inert can be used as beneficial fill, and can be accumulated and stored in bulk anywhere on site, as long as it is in compliance with the requirements of the *Storm Water Pollution Prevention Plan*.

5.9 SCRAP METAL

Scrap metal will be segregated and stored based on waste type as described in the following sections.

5.9.1 Clean

Clean scrap metal can be accumulated in piles or containers, as appropriate. If placed in containers, the containers will be labeled (Section 5.12) and transported to a designated accumulation area (Section 6).

5.9.2 Non-hazardous Waste Residue

Onsite cleaning and processing of scrap metal with non-hazardous waste residue must be done on an impervious surface to collect and containerize the residual materials removed. Residuals accumulated from scrap recovery are to be contained and labeled as appropriate (Section 5.2).
If non-hazardous waste residue is not removed from scrap metal, the following steps can be taken to recycle the metal with special agreements with the recycling facility:

- The residual materials must be non-hazardous under RCRA with one exception. Scrap metal with lead-based paint can be recycled, even if the lead concentration is greater than the TCLP extraction method limit of 5 mg/L.

- The residual materials must be firmly adhering to the metal. Residual materials not adhering to the metal must be removed.

Scrap metal with non-hazardous waste residue should be sorted, placed in an appropriate sealed container (roll off, drum, etc.), labeled, and transported to a designated accumulation area (Section 6.0).

5.9.3 Hazardous Waste Residue

Onsite cleaning and processing of scrap metal with hazardous waste residue must be done on an impervious surface to collect and containerize the residual materials removed. Residuals accumulated from scrap recovery are to be contained and labeled as appropriate (Section 5.2). If hazardous waste residue is not removed from scrap metal, the material must be placed in an appropriate sealed container (roll off, drum, etc.), labeled as hazardous waste (Section 5.12), and transported to a designated accumulation area (Section 6).

5.10 SOIL AND SEDIMENT

Soil and sediment will be segregated based on category as described in the following:

5.10.1 PCB-Impacted

Soil and sediment that is PCB-impacted will be segregated, placed in sealed containers, labeled as PCB-impacted (Section 5.12), and transported to a designated accumulation area (Section 6). Bulk PCB-impacted demolition debris may also be loaded directly onto trucks or rail cars for disposal.

5.10.2 Hazardous Waste

Soil and sediment that is hazardous waste will be segregated, placed in sealed containers, labeled as hazardous waste (Section 5.12), and transported to a designated accumulation area (Section 6). Bulk hazardous waste may also be loaded directly onto trucks or rail cars for disposal.

5.10.3 Non-hazardous Waste

Soil and sediment that is non-hazardous waste will be segregated, placed in sealed containers, or accumulated on concrete slabs or other lining and containment to prevent contact with the ground surface. If placed in containers, the containers will be labeled (Section 5.12), and transported to a designated accumulation area (Section 6). Bulk non-hazardous waste may also be loaded directly onto trucks or rail cars for disposal.

5.10.4 Inert

Soil and sediment that is inert can be used as beneficial fill, and can be accumulated and stored in bulk anywhere on site, as long as it is in compliance with the requirements of the *Storm Water Pollution Prevention Plan.*

5.11 WATER

Water will be segregated based on waste type as described in the following.

5.11.1 PCB-Impacted

Water that is PCB-impacted will be segregated, placed in drums, tanks, or other sealed containers, labeled as PCB-impacted (Section 5.12), and transported to a designated accumulation area (Section 6).

5.11.2 Hazardous Waste

Water that is hazardous waste will be segregated, placed in drums, tanks, or other sealed containers, labeled as hazardous waste (Section 5.12), and transported to a designated accumulation area (Section 6).

5.11.3 Non-hazardous Waste

Water that is non-hazardous waste will be segregated, placed in drums, tanks, or other sealed containers, labeled (Section 5.12), and transported to an accumulation area (Section 6).

5.11.4 Inert

Water that is inert can be discharged to the ground surface. Discharge to the ground surface must be done in a manner that does not produce discharge to surface water bodies, and must be in compliance with the requirements of the *Storm Water Pollution Prevention Plan*.

5.12 CLEARING AND GRUBBING DEBRIS

Inert clearing and grubbing debris can be accumulated anywhere on site, as long as it is in compliance with the requirements of the *Storm Water Pollution Prevention Plan*. Clearing and grubbing debris that is impacted will be handled as would impacted soil and sediment (Section 5.8).

5.13 PERSONAL PROTECTIVE EQUIPMENT

Personal protective equipment will be placed in sealed containers, labeled based on the material with which it has come in contact (Section 5.12), and transported to a designated accumulation area (Section 6). It may be placed in sealed containers with other waste solids (not liquids) as long as those wastes are designated for offsite disposal. Personal

protective equipment that has come in contact only with inert debris may be placed in solid waste containers, and handled as solid waste.

5.14 LABELING REQUIREMENTS

All containers will be labeled immediately when wastes are placed in them. At a minimum, labels will include a unique identification code, clearly identify the waste type and generation date, and provide a brief description of the waste material and its source. The waste ID will be a simple alphanumeric code that will include BFC and a sequential number.

The waste type is the broad category to which each waste belongs, including but not limited to:

- Asbestos
- Universal Waste
- Used Oil
- PCB Containing
- Hazardous Waste
- Nonhazardous Waste

The generation date is the date on which the waste is first placed in the container. The material description will include a few words, such as “concrete debris” or “contaminated soil”. Similarly, the waste source description will be a few words such as “third floor of fibers building” or “adjacent drum storage pad”. Label information will also be included on the waste inventory (Section 8.1). Bulk waste that does not require labeling will be provided with a unique waste ID for tracking purposes when it is loaded and shipped offsite. This ID and all other relevant information that would otherwise be on a waste container label will be recorded on the waste inventory.

Before shipping, DOT shipping label will be completed, and placed on the containers as required.

Brandenburg® Industrial Service Company
2625 S. Loomis
Chicago, IL 60608
Phone (312) 326-5800
FAX (312) 326-5055

6.0 WASTE ACCUMULATION

Wastes will be accumulated by waste type in areas designated for this type of waste. Multiple waste accumulation areas will be designated, as needed, throughout the course of abatement and demolition activities. The Project Manager, or designee, will identify these areas on a drawing prior to the generation of waste, and this drawing will be made available to site personnel involved with the generation and handling of these wastes.

A waste container may be stored at a work area while being filled with waste, as long as it is properly labeled, and provided with containment, if necessary. Once a container has been filled, it should be moved to a designated accumulation area. Bulk wastes may be accumulated in the work area for a limited period, as long as they are accumulated in a manner and location that does not present a potential risk of impact to soil, surface water, or groundwater (i.e. impacted materials must be accumulated on impacted areas, or on concrete slabs, or other impermeable containment, with cover and berming, as appropriate to prevent runoff).

Waste accumulation areas will be inspected on a routine basis to ensure compliance with applicable regulations. The following sections describe the requirements for waste accumulation areas, inspections, and emergency response.

6.1 WASTEWATER COMPATIBILITY

Wastewater may be collected before it is characterized. For this reason, wastewater collected from different sources (e.g. decontamination at different locations) cannot be combined until Brandenburg representatives have determined that the wastewaters are compatible. Compatibility will be assessed based on ability to mix wastewaters safely and to minimize the cost of waste disposal.

6.2 ASBESTOS

Asbestos waste containers will be accumulated in an area designated for this purpose.

6.3 UNIVERSAL WASTES

Universal wastes will be accumulated in an area designated for this purpose. Universal wastes will be segregated, by waste type, within the accumulation area. Large batteries stored on pallets will be placed undercover, or covered with a tarp. Universal wastes will be stored in an accumulation area for no more than one year.

6.4 PCB-CONTAINING AND HAZARDOUS WASTES

Containers with PCB-containing and/or hazardous wastes will be accumulated in areas designated for this purpose. Containers with PCB-containing and/or hazardous liquids (residual chemical, used oil, or water) must be placed on secondary containment (concrete waste pads with berms, containment pallets, drop cloths, etc.) sufficient to hold the contents of the waste container, were it to burst. If possible, containers of PCB-containing or hazardous liquids should be placed under cover, to prevent accumulation of storm water in the secondary containment. If this is not practical, the containment must

be inspected and drained after each rainfall event, following the requirements of the SWPPP, to maintain adequate capacity for containment of a release.

The BFC is currently identified as a large quantity generator (LQG) of hazardous waste, and will be managed, as practical, to maintain this status until hazardous wastes have been removed from the site. After property transfer, It is the intent of this Plan that the BFC will become a small quantity generator (SQG). As a SQG, the BFC cannot accumulate more than 6,000 kg (6.6 tons) of hazardous waste on site at any one time. As a SQG, hazardous waste may be stored on site for up to 180 days (40 CFR 262.34(d)). If the decontamination and demolition progresses to the point that the facility generates more than 1,000 kg (1.1 tons) of hazardous waste per month, it will qualify as a large quantity generator (LQG) of hazardous waste, and a document will need to be submitted to make this change in status (Section 8.7.2). As long as LQG status is maintained, the storage time for hazardous waste will be decreased to 90 days (40 CFR 262.34(a)).

6.5 NON-HAZARDOUS WASTE SOLIDS

Non-hazardous waste solids (residual chemical, demolition debris, scrap metal, soil, sediment, and personal protective equipment) stored in sealed containers will be accumulated in an area designated for this purpose. Bulk non-hazardous demolition debris will be stored on concrete slabs. Bulk scrap metal shall be stored on concrete slabs. Soil and sediment shall be staged adjacent the excavation area and covered with plastic sheeting or bermed to prevent storm water runoff.

6.6 NON-HAZARDOUS WASTE LIQUIDS

Containers with non-hazardous waste liquids (residual chemical, waste oil, water, etc.) will be accumulated in an area designated for this purpose. These containers must have secondary containment (concrete waste pads with berms, containment pallets, etc.) sufficient to hold the contents of the waste containers, were they to be released. If possible, containers of non-hazardous liquids should be placed under cover, to prevent accumulation of storm water in the secondary containment. If this is not practical, the containment must be inspected and drained after each rainfall event, to maintain adequate capacity for containment of a release.

6.7 INERT MATERIALS

Inert materials will be accumulated in areas designated for this purpose. These wastes must be accumulated in compliance with the requirements of the *Storm Water Pollution Prevention Plan*.

6.8 INSPECTION OF ACCUMULATION AREAS

Hazardous waste accumulation areas are required to be inspected on a weekly basis (40 CFR 265.174). Other designated waste accumulation areas will be voluntarily inspected on a weekly basis. At a minimum, inspections will verify the following:

- Proper closure and labeling of waste containers

- Adequate containment for liquid wastes
- Satisfactory condition of waste containers
- Presence and condition of required spill control equipment
- Appropriate cover and berming for bulk wastes
- Compliance with the requirements of the *Storm Water Pollution Prevention Plan* for inert, and rooting and grubbing wastes.

Inspections will be documented in an inspection log sheet and maintained on site (Section 7). Any problems noted during the inspection will be addressed immediately, and the corrective action will be documented on the inspection log sheet.

6.9 EMERGENCY EQUIPMENT AND PROCEDURES

Sufficient emergency supplies and equipment as required for fire fighting, spill containment and clean-up will be maintained at areas where PCB-containing, hazardous, or liquid wastes, as well as residual chemicals or used oil are accumulated. At a minimum, the following is required:

- Absorbent pigs (1 drum)
- Absorbent pillows and pads (1 drum)
- Gloves (10 pairs of various sizes)
- Dry chemical fire extinguishers (2)
- Shovels (2)
- Empty drums (4)
- Inflatable balloons or plugs (4)
- Plastic or metal buckets (2)
- Oil absorbent cloths (1 roll)
- Brooms (2)
- Electric pump (1).

If an incident or emergency occurs, please refer to the Health and Safety Plan for response procedures.

Brandenburg® Industrial Service Company
2625 S. Loomis
Chicago, IL 60608
Phone (312) 326-5800
FAX (312) 326-5055

7.0 WASTE DISPOSAL

Specific disposal and recycling facilities for the wastes described in this plan will be selected in accordance with appropriate waste disposal regulations by the contractors performing the abatement and demolition work and is subject to approval by Brandenburg. A list of specific approved facilities for each waste type will be maintained by the Project Manager, and distributed to personnel responsible.

The following categories of materials may be transported to an offsite facility and disposed of or recycled:

- Clean Scrap Metal: recycled at scrap metal recycling and/or processing facility
    - Example Facility: Rocky Mountain Recycling – Commerce City, CO
- Clean Concrete/Brick/CMU: recycled onsite through heavy machinery processing and portable crushing plant for reuse
    - Remains onsite
- Hazardous Waste: disposal at Subtitle C Landfill
    - Example Facility: Lone Mountain Landfill – Waynoka, OK
- Non-hazardous Waste: disposal at Subtitle D Landfill
    - Example Facility: Deffenbaugh Landfill – Shawnee, KS
- Materials with PCB concentration >50 mg/kg: disposal at Subtitle C Landfill
    - Example Facility: Lone Mountain Landfill – Waynoka, OK
- Materials with PCB concentration <50 mg/kg and >1 mg/kg: disposal at Subtitle D Landfill
    - Example Facility: Deffenbaugh Landfill – Shawnee, KS
- Clean Construction and Demolition Debris: disposal at Subtitle D Landfill
    - Example Facility: Deffenbaugh Landfill – Shawnee, KS
- Combination Hazardous Waste & Materials with PCB concentration >50 mg/kg: disposal at CleanHarbors Facility to be determined
    - Example Facility: To Be Determined

Brandenburg® Industrial Service Company
2625 S. Loomis
Chicago, IL 60608
Phone (312) 326-5800
FAX (312) 326-5055

8.0 DOCUMENTATION AND REPORTING

The following sections describe required documentation and reporting associated with waste management. All required documentation will be maintained on site for the duration of the project.

8.1 WASTE INVENTORY

A running waste inventory will be kept for all containers of waste on site and all bulk shipments of waste sent offsite. At a minimum, this inventory will include a unique waste identifier, waste type, container type, volume, generation date, transportation date, disposal date, and a checklist to identify receipt of manifests, weight tickets, and certificates of disposal, treatment, or destruction. In particular, this inventory will be used to account for hazardous wastes, to identify if a change in generator status is needed (Section 8.7.2).

8.2 WASTE PROFILE/WASTE ANALYSES

Waste profiles are required by disposal facilities to verify waste characterization. Waste profile forms will be provided by the disposal facility, and must be completed prior to transporting waste to that facility. Copies of completed waste profile forms will be maintained on site for reference. Laboratory analytical reports for waste analyses will be stored along with the waste profiles they support.

8.3 WASTE ACCUMULATION AREA INSPECTION CHECKLISTS

An inspection checklist form (Appendix B) will be completed for every inspection of a designated waste accumulation area. Signed checklist forms will be used to document the required weekly inspection of hazardous waste accumulation areas under RCRA.

8.4 WASTE MANIFESTS

Waste manifests will be completed for all wastes transported offsite. Waste manifests will be signed by a representative of BFC or their designee. Anyone other than a BFC employee must have a written authorization from BFC to sign a manifest. Copies of hazardous waste manifests signed by the disposal facility must be returned to BFC or their designee within 45 days from the date which the waste was accepted by the first transporter. If the manifest is not received within this timeframe, an exception report (8.7.3) will be submitted to the MODNR the date the signed manifest was received and will be entered into the waste inventory (Section 8.1) with copies of completed manifests to be maintained on site.

8.5 WEIGHT TICKETS

Weight tickets will be generated both at the BFC and at the disposal facility for wastes sent offsite. Weight tickets will be attached to the waste manifest, and maintained on site.

8.6 CERTIFICATES OF DISPOSAL, TREATMENT OR DESTRUCTION

Certificates of disposal of disposal, treatment or destruction, as appropriate will be obtained for all wastes sent offsite. These will be attached to the manifest, and maintained on site.

8.7 REPORTING

Reporting under RCRA (Section 8.7.1 and 8.7.2) will be required as long as the site is generating, storing, or transporting hazardous or universal waste. Once hazardous and universal wastes have been removed from the site, a change in status (Section 8.7.2) can be submitted to indicate that the BFC is no longer a generator of hazardous or universal waste.

Self-illuminating EXIT signs must be transferred to a specific general licensee, such as a manufacturer, distributor, licensed radioactive waste broker or licensed low-level radioactive waste disposal facility. Under 10 CFR 31.5, within 30 days of disposing a self-illuminating EXIT sign, the general licensee must file a report with disposal information to the NRC.

8.7.1 RCRA Biennial Report

A biennial report must be completed and submitted to MODNR by March 1 of every even numbered year, for as long as the BFC is shipping hazardous or universal waste offsite. The biennial report will be submitted on USEPA Form 8700-13A, and must be signed by BFC representative.

8.7.2 Change in RCRA Generator Status

If there is a change in the volume of hazardous or universal waste generated at the BFC that would trigger a change in RCRA generator status, and once the facility ceases to be a generator the MODNR must be notified. Notification will be accomplished with submittal of a USEPA Form 8700-12.

8.7.3 Exception Report

If a copy of a hazardous waste manifest signed by the disposal facility is not received within 45 days, an exception report will be submitted to MODNR. This report will include a cover letter signed by BFC or their authorized designee summarizing the efforts taken to locate the waste, and the outcome of these efforts. A copy of the original manifest must be included with this report.

8.7.4 Summary Report

At the conclusion of site demolition and closure, Brandenburg will prepare a report summarizing the demolition and closure activities. One element of this report will be a summary of waste management activities. This summary will include an inventory of the

Brandenburg® Industrial Service Company
2625 S. Loomis
Chicago, IL 60608
Phone (312) 326-5800
FAX (312) 326-5055

wastes generated during demolition, and their final disposition. At a minimum, the summary will also include copies of the following documents:

- Waste profiles
- Laboratory analytical reports for waste analyses
- Waste manifests
- Weight tickets
- Certificates of disposal, treatment, or destruction
- Biennial reports
- Change in generator status reports.

Brandenburg® Industrial Service Company
2625 S. Loomis
Chicago, IL 60608
Phone (312) 326-5800
FAX (312) 326-5055

9.0 RADIATION

At the time of developing this Manual, an assessment and survey of potentially radioactive materials and debris could not be completed with the exception of self-illuminating EXIT signs. Therefore, all Manuals and Plans developed by Brandenburg will be completed with the assumption that there is no radioactive contamination at the BFC. If a radioactive material contamination investigation is completed at a later date, these Manuals and Plans will be revised accordingly.

Brandenburg® Industrial Service Company
2625 S. Loomis
Chicago, IL 60608
Phone (312) 326-5800
FAX (312) 326-5055

Brandenburg®

www.Brandenburg.com

EXAMPLE WASTE MANIFESTS

Brandenburg® Industrial Service Company
2625 S. Loomis
Chicago, IL 60608
Phone (312) 326-5800
FAX (312) 326-5055

Brandenburg®

www.Brandenburg.com

EXAMPLE HAZARDOUS WASTE MANIFEST

Please print or type. (Form designed for use on elite (12-pitch) typewriter.)

Form Approved. OMB No. 2050-0039

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator ID Number
2. Page 1 of
3. Emergency Response Phone
4. Manifest Tracking Number

5. Generator's Name and Mailing Address

Generator's Site Address (if different than mailing address)

Generator's Phone:

6. Transporter 1 Company Name

U.S. EPA ID Number

7. Transporter 2 Company Name

U.S. EPA ID Number

8. Designated Facility Name and Site Address

U.S. EPA ID Number

Facility's Phone:

9a. HM	9b. U.S. DOT Description (including Proper Shipping Name, Hazard Class, ID Number, and Packing Group (if any))	10. Containers No.	10. Containers Type	11. Total Quantity	12. Unit Wt./Vol.	13. Waste Codes
	1.					
	2.					
	3.					
	4.					

14. Special Handling Instructions and Additional Information

15. **GENERATOR'S/OFFEROR'S CERTIFICATION:** I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations. If export shipment and I am the Primary Exporter, I certify that the contents of this consignment conform to the terms of the attached EPA Acknowledgment of Consent.
I certify that the waste minimization statement identified in 40 CFR 262.27(a) (if I am a large quantity generator) or (b) (if I am a small quantity generator) is true.

Generator's/Offeror's Printed/Typed Name | Signature | Month | Day | Year

GENERATOR

15. International Shipments ☐ Import to U.S. ☐ Export from U.S. Port of entry/exit:

Transporter signature (for exports only): Date leaving U.S.:

INT'L

17. Transporter Acknowledgment of Receipt of Materials

Transporter 1 Printed/Typed Name | Signature | Month | Day | Year

Transporter 2 Printed/Typed Name | Signature | Month | Day | Year

TRANSPORTER

18. Discrepancy

18a. Discrepancy Indication Space ☐ Quantity ☐ Type ☐ Residue ☐ Partial Rejection ☐ Full Rejection

Manifest Reference Number:

18b. Alternate Facility (or Generator)

U.S. EPA ID Number

Facility's Phone:

18c. Signature of Alternate Facility (or Generator) | Month | Day | Year

19. Hazardous Waste Report Management Method Codes (i.e., codes for hazardous waste treatment, disposal, and recycling systems)

1. 2. 3. 4.

20. Designated Facility Owner or Operator: Certification of receipt of hazardous materials covered by the manifest except as noted in Item 18a

Printed/Typed Name | Signature | Month | Day | Year

DESIGNATED FACILITY

EPA Form 8700-22 (Rev. 3-05) Previous editions are obsolete.

DESIGNATED FACILITY TO DESTINATION STATE (IF REQUIRED)

Brandenburg® Industrial Service Company
2625 S. Loomis
Chicago, IL 60608
Phone (312) 326-5800
FAX (312) 326-5055

Brandenburg®

www.Brandenburg.com

EXAMPLE NONHAZARDOUS WASTE MANIFEST

Please print or type.
(Form designed for use on elite (12-pitch) typewriter.)

NON-HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No.
Manifest Doc. No.
2. Page 1 of

GENERATOR

3. Generator's Name and Mailing Address

4. Generator's Phone ( )

5. Transporter 1 Company Name
6. US EPA ID Number
A. Transporter's Phone

7. Transporter 2 Company Name
8. US EPA ID Number
B. Transporter's Phone

9. Designated Facility Name and Site Address
10. US EPA ID Number
C. Facility's Phone

11. Waste Shipping Name and Description	12. Containers No.	12. Containers Type	13. Total Quantity	14. Unit Wt/Vol
a.				
b.				
c.				
d.				

D. Additional Descriptions for Materials Listed Above

E. Handling Codes for Wastes Listed Above

15. Special Handling Instructions and Additional Information

16. **GENERATOR'S CERTIFICATION:** I certify the materials described above on this manifest are not subject to federal regulations for reporting proper disposal of Hazardous Waste.

Printed/Typed Name | Signature | Month | Day | Year

TRANSPORTER

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name | Signature | Month | Day | Year

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name | Signature | Month | Day | Year

FACILITY

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of waste materials covered by this manifest except as noted in Item 19.

Printed/Typed Name | Signature | Month | Day | Year

Printed by J. J. KELLER & ASSOCIATES, INC.
Neenah, WI 54957-0959

ORIGINAL – RETURN TO GENERATOR

12-BLS-C6 Rev. 12/98

Brandenburg® Industrial Service Company
2625 S. Loomis
Chicago, IL 60608
Phone (312) 326-5800
FAX (312) 326-5055

Brandenburg®

www.Brandenburg.com

EXAMPLE WASTE INVENTORY DOCUMENTATION

Brandenburg® Industrial Service Company
2625 S. Loomis
Chicago, IL 60608
Phone (312) 326-5800
FAX (312) 326-5055

Brandenburg®

www.Brandenburg.com

EXAMPLE WASTE INVENTORY STORAGE LOG

	Hazardous and Regulated Material Inventory						
	Brandenburg Industrial Service Company		**INSERT PROJECT NUMBER HERE**				
	ITEM	Entry Date	Container Description	Quantity of Containers	Material Classification/Labeling	Shipment Date	Approval Number
1							
2							
3							
4							
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							

Brandenburg® Industrial Service Company
2625 S. Loomis
Chicago, IL 60608
Phone (312) 326-5800
FAX (312) 326-5055

Brandenburg®

www.Brandenburg.com

EXAMPLE WASTE INVENTORY INSPECTION LOG

	Regulated and Hazardous Material Storage Area Inspection Form			
	INSERT PROJECT NUMBER HERE			
	Date:			
	Inspected By:			
		Yes	No	Comments:
1	Are all drums secure with no apparent leakage?			
2	Are there any spills?			
3	Is general housekeeping in order?			
4	Has the time limit been exceeded for any accumulated hazardous material?			
5	Is the waste material log present?			
6	Is the waste material log accurate?			
7	Are materials properly segregated and labeled?			
8	Are berms intact?			
9	Are floor drains covered?			
10	Are spill kit(s) available and maintained?			
11	Are appropriate fire extinguishers availabe and current?			
12	List below any corrective actions implemented today:			

Brandenburg® Industrial Service Company
2625 S. Loomis
Chicago, IL 60608
Phone (312) 326-5800
FAX (312) 326-5055

Brandenburg®

www.Brandenburg.com

BANNISTER FEDERAL COMPLEX DEMOLITION PLAN: TRAFFIC CONTROL PLAN

Brandenburg® Industrial Service Company
2625 S. Loomis
Chicago, IL 60608
Phone (312) 326-5800
FAX (312) 326-5055

1. INTRODUCTION

This document serves as the *Traffic Control Plan* (Plan) to be followed during the demolition of the Bannister Federal Complex (BFC), describing the procedures for protecting area residents, protecting pedestrians and vehicle traffic onsite and on local roads, entrance and exit points for the site, allowable parking areas, traffic and pedestrian control measures, rail traffic, and roll-off pick up and drop off procedures in accordance with applicable regulatory and project requirements. The content and format of this Plan is particularly designed for craft and field personnel to be a user-friendly reference document, with simple, understandable and consistent procedures (e.g., bulleted lists, tables, etc.), to promote timely and accurate decision-making processes regarding traffic control as site conditions evolve.

Implementation of the Plan will be the primary means to meet the following objectives of the project:

- Provide pedestrian and vehicle traffic control methods onsite and on local roads.
- Provide information on the site entrance and exit points, traffic patterns, parking areas, rail traffic, and roll-off pickup and drop of procedures.

2. REGULATORY BACKGROUND

Traffic control measures utilized during the project are subject to federal, state, and local regulations, as well as site-specific policies and procedures. This Plan was developed to enable compliance with applicable regulations and requirements.

The following regulations and / or regulatory agencies are potentially applicable to the traffic control activities at the site:

- US Department of Transportation (DOT), "Manual on Uniform Traffic Control Devices," Part 6 – Temporary Traffic Control
- Occupational Safety and Heath Administration (OSHA)
- Missouri Department of Transportation (MDOT)

3. INTEGRATION WITH RELATED WORK PLANS

The Site's activities are conducted under several work plans that contain elements related to traffic control. This Plan incorporates the key elements of these related plans where appropriate. However, the related plans should be reviewed in their entirety to identify additional requirements outside of the scope of this Plan.

3.1 DEMOLITION WORK PLAN

The Demolition Work Plan includes security procedures for entry and exit to the site. The Demolition Work Plan contains the demolition sequence and should be referenced as necessary if established traffic routes and entry or exit gates are affected at different stages of the demolition.

3.2 WASTE OPERATIONS MANUAL

The Waste Management Plan describes the procedures to characterize, segregate, store, and otherwise manage waste from the point of generation through disposal in accordance with regulatory and project requirements.

3.3 HEALTH & SAFETY PLAN

The Health & Safety Plan describes the responsibilities, training requirements, protective equipment, and safety procedures necessary to minimize the risk of injury, fires, explosion, chemical spills, and material damage incidents related to construction activities. Site security and control is discussed in the Health & Safety Plan. This Plan provides the procedures for restricting access to the site to persons who have the proper safety training and have received a documented site safety orientation. This section also includes information regarding citizenship, language, drug and alcohol testing, the entry / exit log for the site, and visitors.

Brandenburg® Industrial Service Company
2625 S. Loomis
Chicago, IL 60608
Phone (312) 326-5800
FAX (312) 326-5055

4. PROTECTION OF AREA RESIDENTS AND LOCAL ROADWAYS

This section of the Plan describes the procedures to protect area residents and local roadways during the project. Pedestrians and the traveling public will be protected from injury or damage at all times. Access to the Site by area residents will be controlled by the outside perimeter fence, locked gates, and a security check point at the Site's main entrance.

Site Traffic will access the Site from Northbound Troost at the Northwest corner of the BFC property – see Figure 1 for details.

Brandenburg® Industrial Service Company
2625 S. Loomis
Chicago, IL 60608
Phone (312) 326-5800
FAX (312) 326-5055

5. POINTS OF ENTRY AND EXIT

This section addresses the Site entry and exit points for contractors, visitors, and emergency vehicles.

5.1 ENTRY AND EXIT POINTS FOR CONTRACTORS, VISITORS, AND EMERGENCY VEHICLES

The main entrance to the site will be from Northbound Troost Street at the Northwest corner of the BFC property. Parking lots will be accessed via the plant road as shown in Figure 1 of this Plan. This gate will serve as the entry and exit point for all contractor and visitor vehicle and pedestrian traffic.

5.2 ENTRY AND EXIT POINT FOR ALL TRUCK TRAFFIC

The entry and exit to the site for all truck traffic will be from Northbound Troost Street at the Northwest corner of the BFC property. As shown in Figure 1, this gate will be used for truck traffic only. If this gate is unable to be used all traffic will use the Southeast gate off 95th Terrace.

Brandenburg® Industrial Service Company
2625 S. Loomis
Chicago, IL 60608
Phone (312) 326-5800
FAX (312) 326-5055

6. PARKING AREAS

Parking is permitted in specified areas only. Stationary vehicles are not to black entrance ramps, trash docks, or truck doors. Parking is not permitted over yellow-lined walkways or curbs. Parking is not permitted along the bulk and container trailer route as depicted in Figure 1.

6.1 TRAFFIC FLOW PROCEDURES

Figure 2 depicts the proper entrance and exit for the main contractor parking lot located at the construction entrance gate. It is recommended that vehicles back in to parking spaces to allow for easier and faster exiting in case of an emergency. All vehicles must follow the arrows for the specified route to enter or exit parking lots.

Brandenburg® Industrial Service Company
2625 S. Loomis
Chicago, IL 60608
Phone (312) 326-5800
FAX (312) 326-5055

7. ONSITE VEHICLE TRAFFIC CONTROL MEASURES

This section provides information relating to traffic control measures on-site and inside the plant. While inside the plant, all vehicles shall obey posted traffic signs. "On-site" is defined as the area inside of the perimeter fence of the Site. "Inside the plant" is defined as the area inside of the Main Gate. In general, the following measures in place on-site at all times:

- Passengers inside a vehicle must be seated with a seat belt fastened whenever the vehicle is in motion.
- Yield right of way to pedestrians at all times. Do not drive inside of the yellow lined pedestrian sidewalks.
- Observe traffic signs and the posted speed limits at all times.

7.1 REQUIRED DOCUMENTATION FOR ONSITE VEHICLES

All vehicles entering the site will be required to provide proof of valid insurance and vehicle registration to security. All drivers will also be required to provide a valid driver's license.

7.2 GASOLINE AND ELECTRIC POWERED VEHICLES INSIDE THE PLANT

All gasoline and electric vehicles inside the plant must be shut off and unlocked with the keys left inside while unattended or parked.

7.3 DIESEL FUEL POWERED VEHICLES INSIDE THE PLANT

Diesel fuel powered vehicles are required to be attended at all times while inside the plant.

7.4 INTERNAL COBUSTION VEHICLES OR MACHINERY

Internal combustion vehicles or machinery may not be operated inside buildings without proper engineering controls, such as installation of ventilation or exhaust systems.

7.5 STABILIZE LOADS

Drivers and haulers are responsible to the stability of the material being hauled. Ensure loads are stabilized prior to transportation.

7.6 MOBILE EQUIPMENT BACKUP ALARMS

All mobile equipment on-site must have an audible backup alarm. All vehicles shall have an operable horn that shall be sounded by the driver prior to backing up.

8.0 PEDESTRIAN TRAFFIC CONTROL MEASURES

This section addresses pedestrian traffic control.

8.1 CROSSWALKS

Pedestrian crosswalks are located throughout the Site and should be utilized when possible to minimize the potential for vehicle contact.

8.2 PEDESTRIAN WALKWAYS

The Site does not have sidewalks; therefore, pedestrian walkways have been established. Pedestrians will remain inside these yellow outlined walkways while inside the plant, whenever possible.

Brandenburg® Industrial Service Company
2625 S. Loomis
Chicago, IL 60608
Phone (312) 326-5800
FAX (312) 326-5055

9.0 RAIL & RAIL TRAFFIC CONTROL MEASURES

Railway may be used to assist in the transportation of material from the BFC. CenterPoint Properties and/or their Subcontractors along with the Union Pacific Railroad will coordinate installation and provide usage to a rail spur within the work area described in Section 7.0 of the *Demolition Work Plan*. This on-site railway may be used to transport materials throughout the project. This section provides information relating to rail traffic control measures.

9.1 RAIL CAR MOVEMENT

Brandenburg will be notified of incoming trains by the demolition contractor as far in advance as possible. Rail car delivery will be dependent on the amount of traffic at the local switchyard and delivery the day of notification is possible. If the rail car delivery is during normal working hours (0600 to 1730 Monday through Friday) Brandenburg will dispatch two certified spotters to meet the train at the rail entrance gate. One spotter stationed on each side of the train will lead the train through the Site to the loading area. When the train departs the Site, the same procedure will be utilized.

Delivery and pick up of contractor-controlled rail cars shall be scheduled for normal working hours. After-hours pick up / delivery will be handled on a case-by-case basis and will be coordinated by Brandenburg.

Brandenburg may also pick up or deliver Brandenburg-owned rail cars to or from the site. This shall be handled on a case-by-case basis.

When positioning rail cars with a locomotive or track mobile type, a ground spotter is required.

9.2 RAIL CAR MOVEMENT WORKER NOTIFICATION

Workers will be notified of rail movement and road closures during the daily toolbox meetings.

Brandenburg® Industrial Service Company
2625 S. Loomis
Chicago, IL 60608
Phone (312) 326-5800
FAX (312) 326-5055

10.0 PROTECTION AND DIVERSION OF PEDESTRIAN AND VEHICULAR TRAFFIC IN WORK AREAS

This section outlines the procedures for the protection and diversion of pedestrian and vehicular traffic in work areas.

10.1 SPOTTERS

Properly trained personnel will be used throughout the project to protect pedestrian and vehicular traffic. Spotters may be used to divert pedestrian and vehicular traffic from rail deliveries, high risk demolition activities, or movement or large equipment.

10.2 ERECTION OF BARRICADES

Barricades may be directed throughout the project to protect pedestrians from heavy traffic or dangerous demolition activities. Barricades may also be used to divert vehicular traffic from entering areas of active demolition activity.

10.3 LIGHTING

Lighting may be erected during the project in front of equipment and in work areas with limited visibility.

10.4 ERECTION AND MAITENANCE OF SIGNAGE

Signs used to notify or warn persons of potential hazards will be visible at all times when work is being performed and will be removed or covered promptly when the hazards no longer exist.

10.4.1 Danger Signs

Danger signs will be used only where an immediate hazard exists. Danger signs will have red as the predominant color for the upper panel; black outline on the borders; and a white lower panel for additional sign wording (See Figure 3).

10.4.2 Caution Signs

Caution signs will be used only to warn against potential hazards or to caution against unsafe practices. Caution signs will have yellow as the predominant color; black upper panel and borders; yellow lettering of “caution” on the black panel; and the lower yellow panel for additional sign wording; black lettering will be used for additional wording (see Figure 3).

10.4.3 Exit Signs

Exit signs, when required, will be lettered in legible red letters, not less than 6 inches high, on a white field and the principal stroke of the letters will be at least 3/4-inch in width (see Figure 3).

10.4.4 Safety Instruction Signs

Safety instructions signs, when used, will be white with green upper panel with white letters to convey the principal message. Any additional wording on the sign will be black letters on the white background (see Figure 3).

10.4.5 Directional Signs

Directional signs, other than automotive traffic signs specified in the paragraph below, will be white with a black panel and a white directional symbol. Any additional wording on the sign will be black letters on the white background.

10.4.6 Traffic Signs

Construction areas will be posted with legible traffic signs at points of hazard.

All traffic control signs or devices used for protection of construction workers will conform to the American National Standards Institute ANSI D6.1-1971, Manual on Uniform Traffic Control Devices for Streets and Highways.

Brandenburg® Industrial Service Company
2625 S. Loomis
Chicago, IL 60608
Phone (312) 326-5800
FAX (312) 326-5055

11.0 SITE DELIVERIES AND PICKUPS

This section provides the procedures to be followed when there is a delivery or pick up from the site.

11.1 DELIVERY PROCEDURES

11.1.1 When deliveries are expected, contractor supervisor will notify security in the morning of planned activities for the day (i.e. approximate number of trucks, trucking company, material that will be hauled, etc.). When delivery arrives at the security trailer, security will contact the contractor personnel that ordered the delivery.

11.1.2 Once contact has been made with the contractor, security will allow delivery to proceed to delivery location.

11.2 PICKUP PROCEDURES

1. Inbound truck will be loaded with material and proceed to the gate.
2. Outbound trucks will be required to proceed through onsite truck wash station and across track out pad prior to exiting the site.
3. Outbound trucks will be required to proceed through a Bicron radiation detector station prior to exiting the site. The Bicron will be calibrated and detection levels set based on manufacturers recommendations. If the Bicron alarm is sounded, the truck driver will stop and immediately contact Brandenburg personnel for further direction.
4. Appropriate paperwork will be completed by Brandenburg personnel.
5. Copies of paperwork will be distributed.
6. Load will be weighed and inspected.
7. Load will be released to commerce.

Brandenburg® Industrial Service Company
2625 S. Loomis
Chicago, IL 60608
Phone (312) 326-5800
FAX (312) 326-5055

Brandenburg®

www.Brandenburg.com

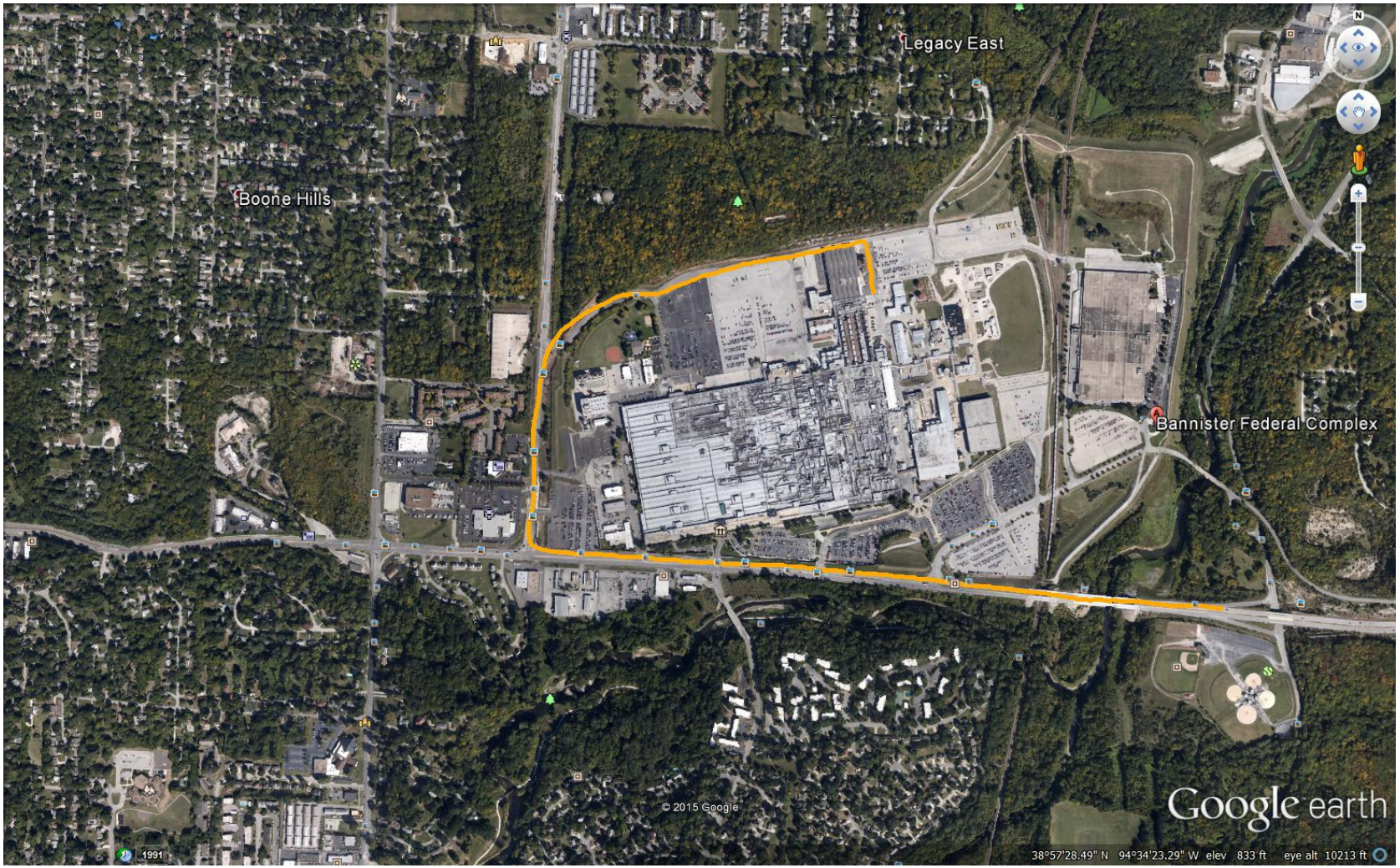
FIGURES

Brandenburg® Industrial Service Company
2625 S. Loomis
Chicago, IL 60608
Phone (312) 326-5800
FAX (312) 326-5055

Brandenburg®

www.Brandenburg.com

FIGURE 1 – SITE VEHICLE TRAFFIC ROUTE

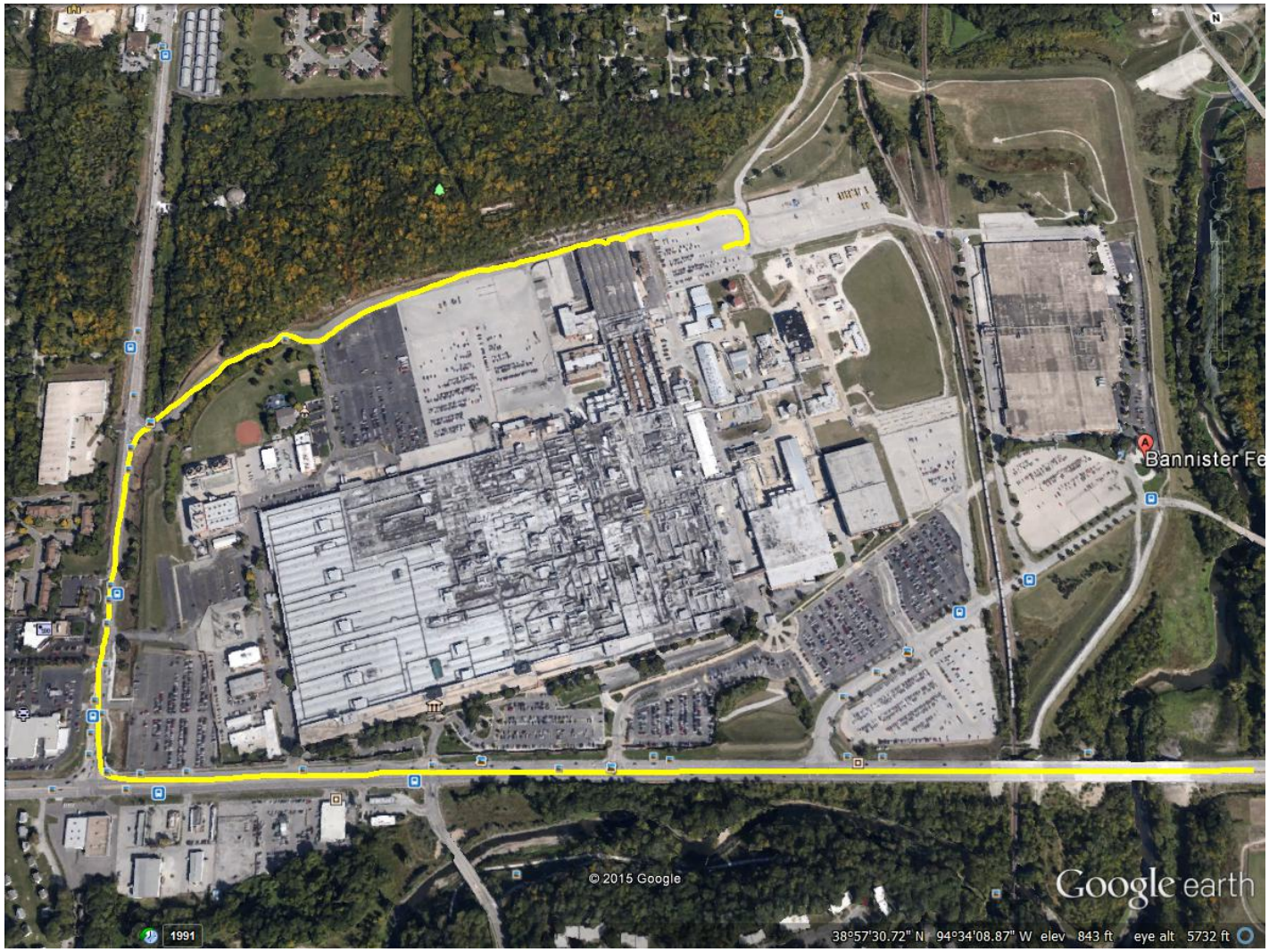


Brandenburg® Industrial Service Company
2625 S. Loomis
Chicago, IL 60608
Phone (312) 326-5800
FAX (312) 326-5055

Brandenburg®

www.Brandenburg.com

FIGURE 2 – TRAFFIC FLOW PROCEDURES

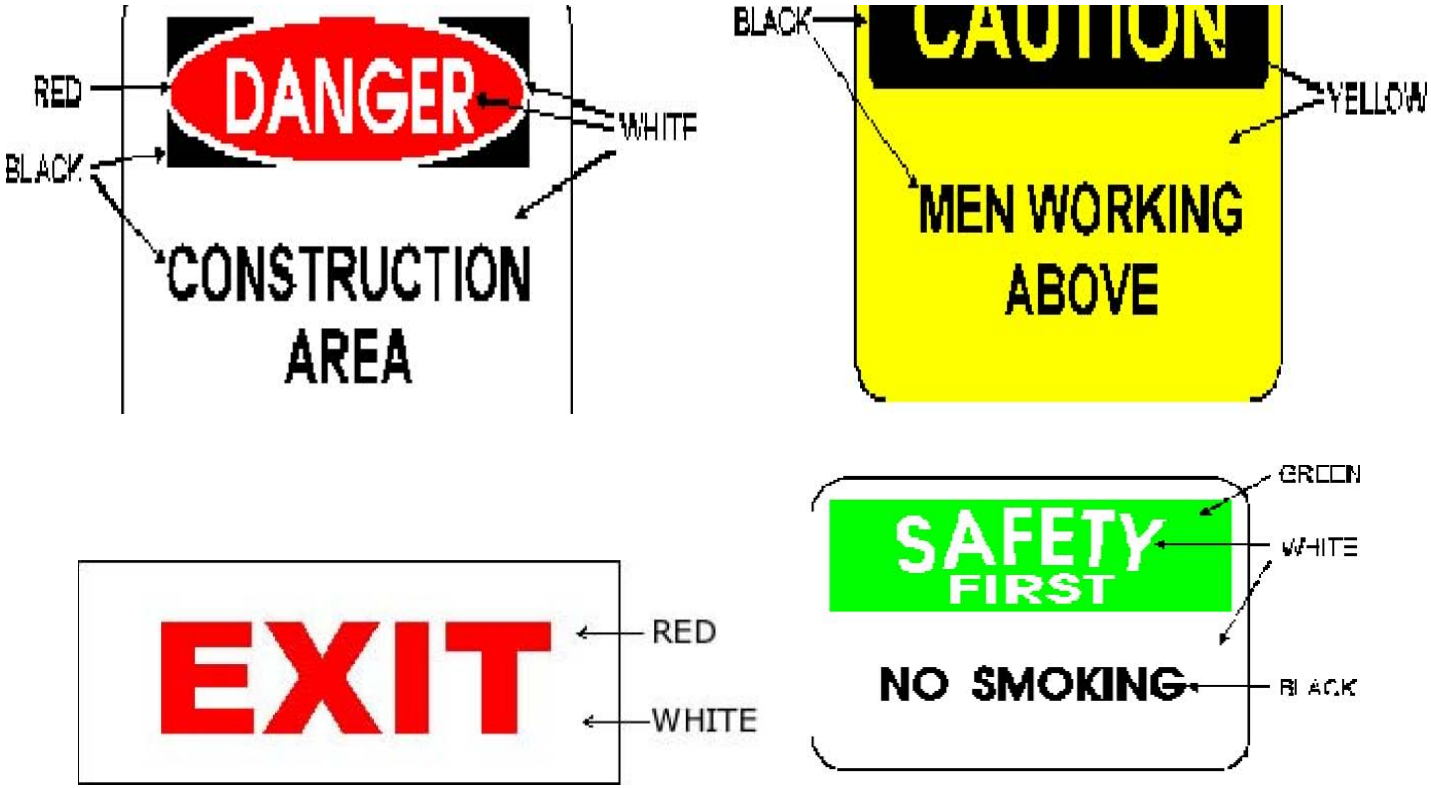


Brandenburg® Industrial Service Company
2625 S. Loomis
Chicago, IL 60608
Phone (312) 326-5800
FAX (312) 326-5055

Brandenburg®

www.Brandenburg.com

FIGURE 3 – PEDESTRIAN AND VEHICULAR TRAFFIC CONTROL SIGNAGE



Brandenburg® Industrial Service Company
2625 S. Loomis
Chicago, IL 60608
Phone (312) 326-5800
FAX (312) 326-5055

Brandenburg®

www.Brandenburg.com

FIGURE 4 – TRUCK SCALE AND WASH WITH TRACK OUT PAD

Brandenburg® Industrial Service Company
2625 S. Loomis
Chicago, IL 60608
Phone (312) 326-5800
FAX (312) 326-5055

Brandenburg®

www.Brandenburg.com

ATTACHMENT 1:
BANNISTER FEDERAL COMPLEX
FACILITY ENVIRONMENTAL ASSESSMENT

Brandenburg® Industrial Service Company
2625 S. Loomis
Chicago, IL 60608
Phone (312) 326-5800
FAX (312) 326-5055

1.0 INTRODUCTION

In support of the remediation and demolition of the Bannister Federal Complex Facility (BFC), a *Facility Environmental Assessment* (FEA) was performed to evaluate and characterize chemical contaminants in the building materials, locate and inventory universal and other regulated waste, and identify potential chemical impacts to soil.

This report includes the results of the FEA and the assessment of the environmental condition of the buildings and structures on site and their component materials. The assessment was performed across the entire BFC, with the exception of the Solid Waste Management Units (SWMUs) and Areas of Concern (AOCs) associated with the ongoing RCRA Corrective Action performed by other CenterPoint Properties Subcontractors. Areas under process equipment were also inaccessible during operation of the BFC, and will be sampled prior to demolition if evidence of potential chemical impact is observed once equipment is removed. The conditions summarized in this report represent those at the time the FEA was completed. As ongoing decontamination and closure work continues, conditions at the BFC are likely to change and may differ from those represented herein.

Brandenburg® Industrial Service Company
2625 S. Loomis
Chicago, IL 60608
Phone (312) 326-5800
FAX (312) 326-5055

2.0 SCOPE OF WORK AND METHODOLOGY

The FEA was performed in accordance with the *Facility Environmental Assessment Work Plan.* To facilitate the FEA implementation, the BFC was classified into FEA survey areas based on use, location, and generator knowledge. As detailed in the work plan, the FEA was conducted using a stepwise approach for each survey area. These steps included:

1. **Reconnaissance** – A walkthrough was conducted of each survey area to identify safety and accessibility concerns and to identify new survey areas or redefine survey areas.
2. **Visual Assessment** – Drums, bulk chemical containers, and oil-containing equipment were inventoried. Material types and sample locations were identified and documented.
3. **Bulk Sample Collection** – Bulk samples were collected and submitted for laboratory analysis. Sample locations were labeled in the field and captured in the BFC geographical information system (GIS).

In addition to the FEA, an evaluation was completed of painted surfaces on potential materials to be reused for fill at the BFC. These materials include but are not limited to concrete, cinder block, and brick. A survey was completed via a Niton X-Ray Fluorescence (XRF) device manufactured by ThermoScientific in accordance with Missouri Department of Natural Resources Solid Waste Management Program's guidelines for using these materials as clean fill, evaluating painted surfaces for the following metals (commonly referred to as the Resource Conservation and Recovery Act [RCRA] metals): arsenic, barium, cadmium, chromium, lead, mercury, selenium, and silver. Subsequent to this FEA, a summary of this evaluation will be completed and available for review.

Brandenburg® Industrial Service Company
2625 S. Loomis
Chicago, IL 60608
Phone (312) 326-5800
FAX (312) 326-5055

3.0 RESULTS

The following sections summarize the results of the FEA:

3.1 BUILDING MATERIAL CHARACTERIZATION

A total of 912 samples of building materials were collected across the BFC. These samples included concrete, asphalt, concrete masonry unit (CMU), acid brick, structural facing brick, and roofing materials. As outlined in the *FEA Work Plan*, samples were analyzed for different parameters based on field observation, sample location, and sample materials. Initially, samples were analyzed for total constituent concentrations to identify areas with constituent concentrations potentially exceeding the toxicity characteristic, as well as areas that exceeded the PCB cleanup level. The extents of these areas were then delineated, both vertically and horizontally with additional sampling. A composite sample was then collected from each potentially hazardous area and analyzed following the Toxicity Characteristic Leaching Procedure (TCLP) to characterize the material for disposal. Using the results of these analyses, building materials were classified as hazardous, PCB-impacted, non-hazardous, and inert. All materials will be disposed of following the requirements of the *Waste Operations Manual.* This report includes maps of sample locations where hazardous, PCB-impacted, non-hazardous, and inert materials were identified. All FEA sample locations are maintained in the project database and can be accessed, as necessary, through Brandenburg.

3.1.1 Hazardous

Materials were defined as hazardous when the concentration of constituents in samples of the material analyzed following the TCLP exceeded the toxicity characteristic levels (40 FCR Part 261.24). Three areas were defined as hazardous based on samples collected from within these areas (Table 1). Volumes of hazardous waste were estimated based on sample results delineating the vertical and horizontal depth of the impacted areas. Hazardous materials will be removed during the decontamination and demolition process, consolidated, and handled following the procedures in the *Waste Operations Manual*.

3.1.2 PCB-Impacted

PCB analysis was performed on 504 samples collected from areas where historical PCB use was possible or where building materials were suspected to contain PCBs. Materials sampled included concrete, CMU, brick, and roofing materials. Sampling results identified five areas of PCB impact (Table 2). PCB-impacted concrete in these areas will be handled, transported, and disposed of following the procedures in the *Waste Operations Manual*.

3.1.3 Inert

To be considered inert, materials must not have concentrations of constituents that exceed the Missouri Department of Natural Resources Solid Waste Management Program Risk-Based Target Levels. Multiple samples did not exceed concentrations for

constituents expected in the bulk materials. These areas are considered inert, and can be used as beneficial fill.

3.1.4 Non-hazardous

Remaining building materials with constituent concentrations below hazardous or PCB-impacted levels, but remain above Target Levels, cannot be used as beneficial fill and will be transported offsite for disposal, in accordance with the *Waste Operations Manual.*

3.2 UNIVERSAL WASTE INVENTORY

Universal and regulated waste accumulation areas were identified and documented. A summary of universal and regulated waste observed in each building was prepared (Table 4). This list provides a summary of the types of universal and regulated wastes, and is not intended to be an exhaustive inventory of all wastes on site. The Universal and Regulated Waste summary is current as of the completion of the FEA field study as of March 2015. Disposition and closure work as been ongoing, and this summary may not be reflective of current conditions at the BFC.

Brandenburg® Industrial Service Company
2625 S. Loomis
Chicago, IL 60608
Phone (312) 326-5800
FAX (312) 326-5055

Brandenburg®

www.Brandenburg.com

TABLE 1: SUMMARY OF TCLP EXCEEDANCES

BANNISTER FEDERAL COMPLEX

Area Description	Sample ID	Sample Media	Analyte	CAS Number	TCLP Limit (mg/L)	Sample Result (mg/L)	Estimated Weight (ton)
Section of wall in southeast corner of NNSA battery dock – T51	BFC-TCESH128	Hardfill	Lead	7439-92-1	5	19.6	5.25
Sludge in plating/etching pit #1 – W46	BFC-ETH2T101	Sludge	Lead	7439-92-1	5	9.0	16.50
Sludge in plating/etching pit #2 – W46	BFC-ETH2T102	Sludge	Lead	7439-92-1	5	185.0	11.00

Brandenburg® Industrial Service Company
2625 S. Loomis
Chicago, IL 60608
Phone (312) 326-5800
FAX (312) 326-5055

Brandenburg®

www.Brandenburg.com

TABLE 2: SUMMARY OF PCB EXCEEDENCES[1]

BANNISTER FEDERAL COMPLEX

Area Description	Sample ID	Sample Media	Analyte	Result[2] (mg/kg)	Estimated Volume of Area (cu yd)
Wood block flooring – D48	BFC-WBF1T101	Wood	Aroclor 1248	9.91	5.6
Wood block flooring – D48	BFC-WBF1T101	Wood	Aroclor 1260	1.15	5.6
Wood block flooring – C28	BFC-WBF2T101	Wood	Aroclor 1248	1.90	119
Wood block flooring – C28	BFC-WBF2T101	Wood	Aroclor 1260	1.04	119
Wood block flooring – C28	BFC-WBF2T102	Mastic	Aroclor 1248	3.31	119
Wood block flooring – C28	BFC-WBF2T102	Mastic	Aroclor 1254	8.93	119
Wood block flooring – C28	BFC-WBF2T103	Wood	Aroclor 1248	1.17	119
Wood block flooring – C28	BFC-WBF2T103	Wood	Aroclor 1254	2.79	119
Wood block flooring – C28	BFC-WBF2T104	Mastic	Aroclor 1248	2.14	119
Wood block flooring – C28	BFC-WBF2T104	Mastic	Aroclor 1254	5.40	119
Department 37B – AA31=>U34	BFC-D37BH142	Hardfill	Aroclor 1248	7.68	408
Department 37B – AA31=>U34	BFC-D37BH143	Hardfill	Aroclor 1248	3.93	408
Department 37B – AA31=>U34	BFC-D37BH145	Hardfill	Aroclor 1248	4.48	408
Department 37B – AA31=>U34	BFC-D37BH146	Hardfill	Aroclor 1248	5.04	408
Department 37B – AA31=>U34	BFC-D37BH147A	Hardfill	Aroclor 1248	2.09	408
Department 37B – AA31=>U34	BFC-D37BH147B	Hardfill	Aroclor 1248	2.81	408
Department 37B Bsmt - AA30=>U32	BFC-U37BH130A	Hardfill	Aroclor 1248	7.57	0.75
Department 37B Bsmt - AA30=>U32	BFC-U37BH130B	Hardfill	Aroclor 1248	4.24	0.75
Department 37B Roof – AA30=>U35	BFC-ROOFR105	Roof Membrane	Aroclor 1260	2.63	1865
Department 37B Roof – AA30=>U35	BFC-ROOFR108	Roof Membrane	Aroclor 1248	2.88	1865
Department 37B Roof – AA30=>U35	BFC-ROOFR109	Roof Membrane	Aroclor 1260	23.80	1865
Department 37B Roof – AA30=>U35	BFC-	Roof Membrane	Aroclor 1248	1.44	1865

Brandenburg® Industrial Service Company
2625 S. Loomis
Chicago, IL 60608
Phone (312) 326-5800
FAX (312) 326-5055

Brandenburg®

www.Brandenburg.com

	ROOFR110B				
Department 37B Roof – AA30=>U35	BFC-ROOFR111	Roof Membrane	Aroclor 1248	1.32	1865
Department 37B Roof – AA30=>U35	BFC-ROOFR121	Roof Membrane	Aroclor 1248	20.20	1865
Department 37B Roof – AA30=>U35	BFC-ROOFR125	Roof Membrane	Aroclor 1248	6.37	1865
Department 37B Roof – AA30=>U35	BFC-ROOFR126	Roof Membrane	Aroclor 1248	8.85	1865
Department 37B Roof – AA30=>U35	BFC-ROOFR128	Roof Membrane	Aroclor 1248	6.22	1865
Department 37B Roof – AA30=>U35	BFC-ROOFR132	Roof Membrane	Aroclor 1248	17.20	1865
Interior of GSA Roof Transformer Rm 25	BFC-ROFGH101	Hardfill	Aroclor 1260	1.59	2550
Interior of GSA Roof Transformer Rm 25	BFC-ROFGH102	Hardfill	Aroclor 1260	1.72	2550
Interior of GSA Roof Transformer Rm 25	BFC-ROFGH103	Hardfill	Aroclor 1260	12.80	2550
Interior of GSA Roof Transformer Rm 25	BFC-ROFGH104	Hardfill	Aroclor 1260	335.00	2550
Interior of GSA Roof Transformer Rm 27	BFC-ROFGH105	Hardfill	Aroclor 1260	86.30	2550
Interior of GSA Roof Transformer Rm 27	BFC-ROFGH106	Hardfill	Aroclor 1260	4.97	2550
Interior of GSA Roof Transformer Rm 27	BFC-ROFGH107	Hardfill	Aroclor 1260	235.00	2550
Interior of GSA Roof Transformer Rm 27	BFC-ROFGH108	Hardfill	Aroclor 1260	1.55	2550
Interior of GSA Roof Transformer Rm 29	BFC-ROFGH109	Hardfill	Aroclor 1260	1.20	2550
Interior of GSA Roof Transformer Rm 29	BFC-ROFGH110	Hardfill	Aroclor 1260	5.23	2550
Interior of GSA Roof Transformer Rm 29	BFC-ROFGH111	Hardfill	Aroclor 1260	156.00	2550
Interior of GSA Roof Transformer Rm 29	BFC-ROFGH112	Hardfill	Aroclor 1260	29.50	2550
Interior of GSA Roof Transformer Rm 32	BFC-ROFGH113	Hardfill	Aroclor 1260	2.01	2550
Interior of GSA Roof Transformer Rm 32	BFC-ROFGH114A	Hardfill	Aroclor 1260	4.07	2550
Interior of GSA Roof Transformer Rm 32	BFC-ROFGH114B	Hardfill	Aroclor 1260	3.39	2550
Interior of GSA Roof Transformer Rm 32	BFC-ROFGH115	Hardfill	Aroclor 1260	5.28	2550
Interior of GSA Roof Transformer Rm 31	BFC-ROFGH117	Hardfill	Aroclor 1260	45.80	2550
Interior of GSA Roof Transformer Rm 31	BFC-ROFGH118	Hardfill	Aroclor 1260	6.64	2550
Interior of GSA Roof Transformer Rm 31	BFC-ROFGH119	Hardfill	Aroclor 1260	345.00	2550
Interior of GSA Roof Transformer Rm 31	BFC-ROFGH120	Hardfill	Aroclor 1260	1.01	2550
Interior of GSA Roof Transformer Rm 33	BFC-ROFGH121	Hardfill	Aroclor 1260	12.90	2550
Interior of GSA Roof Transformer Rm 33	BFC-ROFGH122	Hardfill	Aroclor 1260	1.77	2550

Brandenburg® Industrial Service Company
2625 S. Loomis
Chicago, IL 60608
Phone (312) 326-5800
FAX (312) 326-5055

Brandenburg®

www.Brandenburg.com

Interior of GSA Roof Transformer Rm 33	BFC-ROFGH123	Hardfill	Aroclor 1260	17.90	2550
Interior of GSA Roof Transformer Rm 34	BFC-ROFGH125	Hardfill	Aroclor 1260	6.79	2550
Interior of GSA Roof Transformer Rm 34	BFC-ROFGH126	Hardfill	Aroclor 1260	5.85	2550
Interior of GSA Roof Transformer Rm 34	BFC-ROFGH127	Hardfill	Aroclor 1260	2.51	2550
Department 37B – AA31=>U34	BFC-D37BH148	Hardfill	Aroclor 1242	1.94	408
Department 37B – AA31=>U34	BFC-D37BH149	Hardfill	Aroclor 1242	2.04	408
Department 37B – AA31=>U34	BFC-D37BH150	Hardfill	Aroclor 1242	1.41	408
Department 37B – AA31=>U34	BFC-D37BH152	Hardfill	Aroclor 1242	3.10	408
Department 37B – AA31=>U34	BFC-D37BH155	Hardfill	Aroclor 1242	1.24	408
Department 37B – AA31=>U34	BFC-D37BH156	Hardfill	Aroclor 1242	1.53	408
Department 37B – AA31=>U34	BFC-D37BH157	Hardfill	Aroclor 1242	1.75	408
Department 37B – AA31=>U34	BFC-D37BH161	Hardfill	Aroclor 1242	2.46	408
Department 37B – AA31=>U34	BFC-D37BH163	Hardfill	Aroclor 1242	1.88	408
Department 37B – AA31=>U34	BFC-D37BH164	Hardfill	Aroclor 1242	1.29	408
Department 26 - Roof	BFC-D26R108	Roof Membrane	Aroclor 1248	3.12	1115
Department 26 – Roof	BFC-D26R118	Roof Membrane	Aroclor 1248	4.08	1115
Department 26 – Roof	BFC-D26R121	Roof Membrane	Aroclor 1248	2.98	1115
Department 26 – Roof	BFC-D26R122	Roof Membrane	Aroclor 1248	4.02	1115
Building 15 – Roof	BFC-B15R108	Roof Membrane	Aroclor 1248	4.94	68
Building 15 – Interior 1st Floor	BFC-B15H114	Hardfill	Aroclor 1248	2.20	128
Building 15 – Interior 1st Floor	BFC-B15H116	Hardfill	Aroclor 1248	1.77	128
Building 15 – Interior 1st Floor	BFC-B15H124	Hardfill	Aroclor 1248	2.76	128
Department 26 - Interior	BFC-D26H102	Hardfill	Aroclor 1248	1.36	3485
Department 26 – Interior	BFC-D26H104	Hardfill	Aroclor 1248	2.38	3485
Department 26 – Interior	BFC-D26H105	Hardfill	Aroclor 1248	5.49	3485
Department 26 – Interior	BFC-D26H106	Hardfill	Aroclor 1248	7.52	3485
Department 26 – Interior	BFC-D26H106	Hardfill	Aroclor 1260	3.53	3485
Department 26 – Interior	BFC-D26H107	Hardfill	Aroclor 1248	2.78	3485
Department 26 – Interior	BFC-D26H108	Hardfill	Aroclor 1248	15.50	3485
Department 26 – Interior	BFC-D26H109	Hardfill	Aroclor 1248	6.55	3485
Department 26 – Interior	BFC-D26H110	Hardfill	Aroclor 1248	19.60	3485

Brandenburg® Industrial Service Company
2625 S. Loomis
Chicago, IL 60608
Phone (312) 326-5800
FAX (312) 326-5055

Brandenburg®

www.Brandenburg.com

Department 26 – Interior	BFC-D26H111	Hardfill	Aroclor 1248	19.50	3485
Department 26 – Interior	BFC-D26H112	Hardfill	Aroclor 1248	82.90	3485
Department 26 – Interior	BFC-D26H113	Hardfill	Aroclor 1248	21.20	3485
Department 26 – Interior	BFC-D26H114	Hardfill	Aroclor 1248	229.00	3485
Department 26 – Interior	BFC-D26H115	Hardfill	Aroclor 1248	27.30	3485
Department 26 – Interior	BFC-D26H116	Hardfill	Aroclor 1248	6820.00	3485
Department 26 – Interior	BFC-D26H117	Hardfill	Aroclor 1248	5.59	3485
Department 26 – Interior	BFC-D26H118	Hardfill	Aroclor 1248	6.65	3485
Department 26 – Interior	BFC-D26H121	Hardfill	Aroclor 1248	2.62	3485
Department 26 – Interior	BFC-D26H122	Hardfill	Aroclor 1248	103.00	3485
Department 26 – Interior	BFC-D26H123	Hardfill	Aroclor 1248	8.96	3485
Department 26 – Interior	BFC-D26H124	Hardfill	Aroclor 1248	3.29	3485
Department 26 – Interior	BFC-D26H126	Hardfill	Aroclor 1248	8.52	3485
Department 26 – Interior	BFC-D26H127	Hardfill	Aroclor 1248	4.77	3485
Department 26 – Interior	BFC-D26H128	Hardfill	Aroclor 1248	1.07	3485
Department 26 – Interior	BFC-D26H129	Hardfill	Aroclor 1254	3.01	3485
Department 26 – Interior	BFC-D26H131	Hardfill	Aroclor 1248	12.90	3485
Department 26 – Interior	BFC-D26H132	Hardfill	Aroclor 1248	16.10	3485
Department 26 – Interior	BFC-D26H133	Hardfill	Aroclor 1248	1.14	3485
Department 26 – Interior	BFC-D26H134	Hardfill	Aroclor 1248	5.99	3485
Department 26 – Interior	BFC-D26H135	Hardfill	Aroclor 1248	4.62	3485
Department 26 – Interior	BFC-D26H136	Hardfill	Aroclor 1248	49.20	3485
Department 26 – Interior	BFC-D26H137	Hardfill	Aroclor 1248	24.10	3485
Department 26 – Interior	BFC-D26H138	Hardfill	Aroclor 1248	4.87	3485
Department 26 – Interior	BFC-D26H139	Hardfill	Aroclor 1248	31.20	3485
Department 26 – Interior	BFC-D26H141	Hardfill	Aroclor 1248	3.10	3485
Department 26 – Interior	BFC-D26H144	Hardfill	Aroclor 1248	1.48	3485
Department 26 – Interior	BFC-D26H146	Hardfill	Aroclor 1248	1.34	3485
Department 26 – Interior	BFC-D26H152	Hardfill	Aroclor 1248	1.12	3485
Department 26 – Interior	BFC-D26H153	Hardfill	Aroclor 1248	54.30	3485
Department 26 – Interior	BFC-D26H153	Hardfill	Aroclor 1248	1.39	3485

Brandenburg® Industrial Service Company
2625 S. Loomis
Chicago, IL 60608
Phone (312) 326-5800
FAX (312) 326-5055

Brandenburg®

www.Brandenburg.com

Department 26 – Interior	BFC-D26H154	Hardfill	Aroclor 1248	4.42	3485
Department 26 – Interior	BFC-D26H155	Hardfill	Aroclor 1248	1.76	3485
Department 26 – Interior	BFC-D26H156	Hardfill	Aroclor 1248	1.70	3485
Department 26 – Interior	BFC-D26H157	Hardfill	Aroclor 1248	2.03	3485
Department 26 – Interior	BFC-D26H160A	Hardfill	Aroclor 1248	7.18	3485
Department 26 – Interior	BFC-D26H160B	Hardfill	Aroclor 1248	1.38	3485
Department 26 – Interior	BFC-D26H164	Hardfill	Aroclor 1248	1.06	3485
Department 26 – Interior	BFC-D26H172	Hardfill	Aroclor 1248	1.64	3485
Department 26 – Interior	BFC-D26H174	Hardfill	Aroclor 1248	2.24	3485
Department 26 – Interior	BFC-D26H176	Hardfill	Aroclor 1248	30.50	3485
Building 1 Roof – S46	BFC-B01R101	Roof Membrane	Aroclor 1248	2.49	2595

[1] – For the purpose of this FEA, a PCB result is a hardfill sample greater than 1 milligram per kilogram (mg/kg) or 10 micrograms per 100 square centimeters (µg/100 cm^2) respectively.

[2] – Result(s) greater than 50 mg/kg have been marked with a red highlight.

Brandenburg® Industrial Service Company
2625 S. Loomis
Chicago, IL 60608
Phone (312) 326-5800
FAX (312) 326-5055

Brandenburg®

www.Brandenburg.com

TABLE 3: SUMMARY OF BERYLLIUM DETECTIONS[1]

Sample Area	Sample ID	Media	Result (mg/kg)
Department 93	BFC-D93H114	Hardfill	0.17
Department 93	BFC-D93H146	Hardfill	0.21
Department 93	BFC-D93H148	Hardfill	0.082
Department 93	BFC-D93H151	Hardfill	0.6
Department 93	BFC-D93H197	Hardfill	0.17
Department 93	BFC-D93H198	Hardfill	0.22
Department 93	BFC-D93H200	Hardfill	0.16
Department 93	BFC-D93H201	Hardfill	0.14
Department 93	BFC-D93H202	Hardfill	0.17
Department 93	BFC-D93H203	Hardfill	0.21
Department 93	BFC-D93H204	Hardfill	1.0
Department 93	BFC-D93H205	Hardfill	1.8
Department 93	BFC-D93H206	Hardfill	1.2
Department 93	BFC-D93H208	Hardfill	1.1
Department 93	BFC-D93H209	Hardfill	1.2
Department 93	BFC-D93H210	Hardfill	0.26
Department 93	BFC-D93H211	Hardfill	0.26
Department 93	BFC-D93H212A	Hardfill	0.24
Department 93	BFC-D93H212B	Hardfill	0.19
Department 93	BFC-D93H213	Hardfill	0.19
Department 93	BFC-D93H214	Hardfill	0.22
Department 93	BFC-D93H215	Hardfill	0.15

Brandenburg® Industrial Service Company
2625 S. Loomis
Chicago, IL 60608
Phone (312) 326-5800
FAX (312) 326-5055

Brandenburg®

www.Brandenburg.com

Department 93	BFC-D93H216	Hardfill	0.19
Department 93	BFC-D93H217	Hardfill	0.23
Department 93	BFC-D93H218	Hardfill	1.3
Department 93	BFC-D93H219	Hardfill	1.4
Department 93	BFC-D93H220	Hardfill	1.4
Department 93	BFC-D93H221	Hardfill	1.3
Department 93	BFC-D93H222	Hardfill	0.85
Department 93	BFC-D93H223	Hardfill	1.1
Department 93	BFC-D93H224	Hardfill	1.5
Department 93	BFC-D93H225	Hardfill	0.38
Department 93	BFC-D93H226	Hardfill	2.7

[1] – For the purpose of this FEA, a beryllium detection is any detectable amount of beryllium.

Brandenburg® Industrial Service Company
2625 S. Loomis
Chicago, IL 60608
Phone (312) 326-5800
FAX (312) 326-5055

Brandenburg®

www.Brandenburg.com

TABLE 4: UNIVERSAL AND REGULATED WASTE SUMMARY

Light Ballasts	31,296	EA
Fluorescent Lights	67,459	EA
High Intensity Mercury Vapor Lights	3,978	EA
Cubicle Lighting	3,060	EA
CFC Containing Equipment	118	EA
Emergency Lights	1,915	EA
Exit Signs	1,770	EA
Fire Extinguishers	657	EA
Fire Hoses	192	EA
Batteries	171	EA
Nitrogen Tanks	7	EA
Ovens – Walk In	5	EA
PC & TV Screens	66	EA
Mercury –Thermostats, Gauges, Light Switches	211	EA

Brandenburg® Industrial Service Company
2625 S. Loomis
Chicago, IL 60608
Phone (312) 326-5800
FAX (312) 326-5055

Brandenburg®

www.Brandenburg.com

ATTACHMENT 2:
BRANDENBURG SAFETY POLICY AND STANDARD OPERATING PROCEDURE MANUAL

Table of Contents

Foreward – Brandenburg Safety Policy Statement

1.0 Administrative

1.01 Project Accident Prevention

1.02 New Employee Orientation

1.03 Employee Injury & Illness Management

1.04 Air Monitoring

1.05 Engineering Survey

1.06 Emergency Preparedness

1.07 Security

1.08 Subcontractor Safety

1.09 Site Specific Health and Safety Plan

1.10 General Safety Rules - Visitors

1.11 Safety and Health Training

1.12 Medical Surveillance

1.13 Modified Duty Work Policy

1.14 Disciplinary Action Policy

1.15 Contractor Process Safety Management

1.16 First Aid – CPR

1.17

1.18 Accident / Incident Investigation and Reporting

2.0 Personal Protective Equipment (PPE)

2.01 Respiratory Protection

2.02 Personal Protective Equipment

3.0 Operations

3.01 Confined Space

3.02 Lock-out/Tag-Out

3.03

3.04

3.05 Fall Protection

3.06 Trenching/Excavation

3.07 Portable Ladder Control & Inspection

3.08 Scaffolding

3.09 Rigging

3.10 Tank Removal

3.11 Hand Tools

3.12 Vehicle Safety

3.13 Traffic Control

3.14 Line Breaking

3.15 Contamination Control

3.16 Hazardous Waste Operations

3.17 Hot Work

3.18 Blasting and the Use of Explosives

3.19 Fire Prevention & Protection Policy

3.20 Powder-Actuated Tools

3.21 Housekeeping

3.22

3.23 Electrical Safe Work Practices

3.24 Hydro Mobile M2 System

3.25 Commercial Diving Operations

3.26 Structural Set-Up Activities

4.0 Maintenance/Construction Equipment

4.01 Equipment Inspections

4.02 Cranes

4.03 Suspended Work Platforms (Man Baskets)

4.04 Forklifts

5.0 Exposure Control & Chemical Hazards

5.01 Hazard Communication

5.02 Benzene

5.03 Lead

5.04 Asbestos

5.05 PCBs

5.06 Bloodborne Pathogens

5.07 Radioactive Materials

5.08 Inorganic Arsenic

5.09 Hearing Conservation

5.10 Thermal Stress

5.11

5.12 Dust Suppression and Control

5.13 Cadmium

5.14 Hexavalent Chromium (Chromium VI)

5.15 Pandemic Preparedness

5.16 Silica

5.17 Butadiene

5.18 Ammonia

Policy

Brandenburg®

Title	Date	Area
Safety Policy	**07/01/2010**	**Corporate**

Brandenburg Industrial Service Company has been widely recognized as an industry leader in safety. Brandenburg has had a successful safety program because we demand individual participation at all levels of our organization. The success of our business depends on an effective safety program.

Brandenburg has developed this manual to document our safety standards. The policies and procedures contained in this manual provide guidelines that our employees use from the initial stages of each project through project completion. Adherence to these standards is mandatory.

Brandenburg has demonstrated that working safely is the only way to provide our customers with low cost services and long term value. Brandenburg will continue to implement safe work practices.

Thomas J. Little

7/1/12

Approved by President Date

Title	Date	Reference	Area
Project Accident Prevention	**11/01/2014**	**1.01**	**Safety**

1. Summary

Brandenburg uses a combination of pre-planning, training, safety meetings, task safety analyses, and inspection processes to prevent accidents. Inspections take place at various project levels. Unsafe conditions and violations of safety policies are documented and addressed accordingly. Follow-up inspections are performed to ensure program effectiveness, establish administrative controls and accountability.

2. Scope

All applicable Brandenburg personnel and work sites will be outlined within this procedure as required

3. Definitions

None

4. Responsibility

Responsibility of personnel will be outlined within this procedure as required

5. Methods

5.1 Each worker has a personal responsibility to work safely. Each worker will:

5.1.1 Inspect his work area

5.1.2 Fix or “make safe” his work area

5.1.3 Report to his Supervisor any unsafe conditions that he cannot “make safe”

5.1.4 Perform work <u>only</u> if qualified to do so

5.1.5 Exercise Stop Work Authority where concerns or questions regarding the control of Health & Safety exist.

5.2 Each Supervisor has a responsibility toward safety. Each Supervisor will:

5.2.1 Inspect the work area for which he is responsible

5.2.2 Correct or “make safe” any unsafe condition

5.2.3 Ensure that workers on his crews are fit for duty

5.2.4 Lead daily safety meetings

5.2.5 Request assistance as needed to correct unsafe conditions

5.2.6 Ensure that workers on his crew do not perform unsafe acts. If workers are observed performing unsafe acts, the Supervisor will counsel the worker until the situation has been remedied. The Supervisor may document the unsafe act on the appropriate form.

5.2.7 Exercise Stop Work Authority where concerns or questions regarding the control of Health & Safety exist.

5.2.8 Present Safety Alert documents when distributed

5.3 Each Environmental Health & Safety (EHS) Manager has a responsibility toward safety. Responsibilities include:

5.3.1 Prior to beginning site work, the EHS Manager will:

5.3.1.1 Review project documents and the engineering survey to identify potential hazards

5.3.1.2 Review the scope of work and complete the safety section of the Engineering Survey

5.3.1.3 Develop a site-specific Health and Safety Plan (HASP) which will:

5.3.1.3.1 Document project specific hazards

5.3.1.3.2 Document how hazard controls will be implemented

5.3.1.4 Review the plan with supervisory personnel

5.3.2 Once work has started:

5.3.2.1 The EHS Manager will conduct regular safety inspections. The scope of the formal inspection will include:

5.3.2.1.1 Observing safety and health exposures and work methods,

5.3.2.1.2 Observing the effectiveness of engineering and administrative controls,

5.3.2.1.3 Discussing any unsafe working conditions with all personnel involved and/or the Supervisor,

5.3.2.1.4 Identifying and implementing corrective actions, as necessary, in conjunction with the Supervisor,

5.3.2.1.5 Reviewing subcontractor activities,

5.3.2.1.6 Identifying potential property damage

5.3.2.1.7 Exercising Stop Work Authority where concerns or questions regarding the control of Health & Safety exist.

5.3.2.2 After completion of the safety inspection, the EHS Manager will:

5.3.2.2.1 Document all findings and corrective measures implemented on the Safety Inspection Report Form (SAF-05)

5.3.2.2.2 Enter completed inspection reports into the database

5.3.2.2.3 Evaluate the effectiveness of any corrective action in subsequent safety inspections.

5.3.2.3 If the EHS Manager observes workers who are violating safety rules, he will correct the situation through the offending worker's Supervisor. The EHS Manager will then document the violation on the Safety Violation Report Form (SAF-05).

5.4 Other Project Accident Prevention programs may include the use of:

5.4.1 Employee Observation Cards

5.4.2 Safety Task Analysis Cards

5.4.3 Safety Program Incentives

5.4.4 Various Work Permits

5.4.5 Coaching, mentoring, and on-the-job training

6. Forms

6.1 Safety Inspection Report Form (SAF-05)

6.2 Safety Violation Report Form (SAF-05)

6.3 Workplace Observation Card (SAF-59)

6.4 Safety Task Analysis Card (SAF-63)

7. Regulatory / Permit Requirements

None

8. Record Keeping

Completed Safety Inspection and Safety Violation forms will be maintained electronically in the database.

The documents used as part of Brandenburg's Project Accident Prevention Program are not intended to be maintained records. Unless an existing policy supersedes the need to maintain these documents, they will be destroyed per Records Retention Form, QUA-05.

Title	Date	Reference	Area
New Employee Orientation	**08/03/2015**	**1.02**	**Safety**

1. Summary

All new hire employees will be given a safety orientation. The orientation will inform the new hire employee of his/her responsibilities concerning safety. A copy of the training information presented during the New Employee Orientation and a safety handbook will be given to each employee for future reference.

2. Scope

All applicable Brandenburg personnel and work sites will be outlined within this procedure as required

3. Definitions

3.1 New Hire - An employee who has not worked for Brandenburg during the previous 12-month period

4. Responsibility

Responsibility of personnel will be outlined within this procedure as required

5. Methods

5.1 Environmental Health & Safety (EHS) Manager

The EHS Manager or qualified designee will provide each new hire employee with a New Employee Orientation. He will ensure that the new hire understands all aspects of the orientation.

5.2 Supervisor

The Supervisor will ensure that each employee has received a New Employee Orientation prior to beginning work.

5.3 Orientation Components

The orientation will include the following as a minimum:

5.3.1 Lecture Discussion

<u>The following subjects will be reviewed</u>:

Introduction to Safety

General Policies

Behavior-Based Safety Programs

Personal Protective Equipment (PPE)

Specialized Work

Work Area Controls

Color Coding

Housekeeping

Working Around Equipment

Operation of Equipment

Working Around Cranes

Rigging

Fall Protection

Aerial Work Platforms (AWP)

Ladders

Scaffolding

Hand and Power Tools

Torch Usage

Compressed Gas Cylinders

Electrical Safety

Control of Hazardous Energy

Fire Prevention and Protection

Safe Lifting

Working Over or Near Water

Operators

Truck Drivers

Shop Workers

Heavy Metals

Hygiene

Bio Hazard Exposure

Hazard Communication

5.3.2 Safety Task Analysis Card (STAC) Form Review (when applicable, project-specific)

5.3.3 Fall Hazard Recognition and procedures to be followed in order to minimize fall hazards

5.3.4 Other New Employee Orientation material may include video presentations of safe work practices on demolition sites, lead safety in demolition and Safety Handbook review.

5.4 New Employee Identification

5.4.1 Each new hire employee will receive a yellow hardhat to be worn for a 12-month period. Following the 12-month period, the employee will receive a brown hardhat indicating more than one year of working experience.

6. Forms

6.1 Safety Handbook (SAF-03)

6.2 Safety Task Analysis Card (SAF-63)

7. Regulatory / Permit Requirements

None

8. Record Keeping

Employee training records are maintained per Employee Files SOP and per Records Retention Form, QUA-05.

Title	Date	Reference	Area
Employee Injury and Illness Management	**7/23/2012**	**1.03**	**Safety**

1. Summary

This policy statement describes employee injury reporting and illness management to be implemented in the event of a work related employee injury, illness or exposure.

2. Scope

All applicable Brandenburg personnel and work sites will be outlined within this procedure as required

3. Definitions

3.1 Work Related Injury – Any physical damage or impairment to a worker which results from a work-related event or from a single instantaneous exposure in the work environment.

3.2 Work Related Illness – Any abnormal condition or disorder, other than one resulting from an occupational injury, caused by exposure to factors associated with employment. It includes acute and chronic illness or a disease, which may be caused by inhalation, physical agents, absorption, ingestion, or direct contact.

3.3 Non-Work Related Injury / Illness – Any event or condition reported during work, but having an origin not related to Brandenburg work activity.

3.4 First Aid - Any one-time treatment and subsequent observation of minor scratches, cuts, burns, splinters, and so forth, which do not require medical treatment. Such treatment and observation are considered first aid even though provided by a physician or registered professional.

3.5 Medical Treatment – Includes treatment of injuries administered by physicians, registered professional personnel, or lay persons (i.e., non-medical personnel). Medical treatment does not include first aid treatment even though provided by a physician or registered professional personnel.

4. Responsibility

Responsibility of personnel will be outlined within this procedure as required

5. Methods

5.1 Employee Notification

Every employee shall immediately notify his Supervisor of every:

Work Related Illness

Work Related Injury

Non Work Related Injury or Illness

5.2 Injury and Illness Reporting

Should an injury / illness occur to any Brandenburg employee, the following steps will be taken:

5.2.1 The worker will immediately notify the Supervisor.

5.2.2 If the incident has resulted in an injury / illness, the Supervisor will first determine if medical assistance is needed. Should medical assistance be required, the injured employee will be escorted to the medical facility by a Brandenburg representative. Medical assistance will be obtained in accordance with the site-specific Health and Safety Plan (HASP).

5.2.3 Once medical assistance has been obtained, or if the injury / illness does not appear to need medical assistance, the Supervisor will notify his immediate Supervisor and the Environmental Health & Safety (EHS) Manager.

5.2.4 As soon as the above notifications are made, the Supervisor will begin an incident investigation.

5.2.5 The Supervisor will complete an Employee Injury Claim.

5.2.6 The Supervisor will forward the completed Employee Injury Claim to the EHS Administrator (FAX #800-849-1619 or dreren@Brandenburg.com) or designee for entry into the database.

5.3 Medical Case Management

5.3.1 The Environmental Health & Safety (EHS) Administrator's responsibilities include:

Providing medical providers with Brandenburg contact and billing information,

Providing authorization for necessary and related medical services,

Securing and coordinating specialized medical treatment,

Maintaining regular communication with medical providers to request status updates and medical records,

Managing the employee's rehabilitation,

Securing written documentation (including medical reports) from medical providers authorizing light duty and/or a full duty work release,

Processing invoices for related medical treatment,

Updating the designated EHS Manager and Operations with treatment plans and appointment dates (office visits, therapy, etc…), and

Assisting EHS Managers in determining which doctor appointments to attend

5.3.2 The Environmental Health & Safety (EHS) Manager's responsibilities include:

Notifying the EHS Administrator of occupational health clinics designated,

Attending medical appointments with the injured employee as determined by the EHS Administrator,

Providing the EHS Administrator and the Operations Manager or Division Manager with updates following medical appointments attended,

Maintaining regular communication with the injured employee in an effort to expedite full duty release and medical discharge,

Forwarding all medical records, including documented work restrictions and work releases, to the EHS Administrator, and

With the assistance of the EHS Administrator, determining which doctor appointments to attend

5.3.3 Medical Records

All medical records will be forwarded to and maintained by the EHS Administrator.

5.4 Modified Duty

5.4.1 Upon determination by the medical provider that the employee may resume employment subject to specific job restrictions, the EHS Manager shall, in accordance with the Modified Duty Work Policy (SOP 1.13), coordinate with the Supervisor the assignment of the employee's modified work duty which incorporates the designated job restrictions.

5.4.2 The EHS Manager and the Supervisor, when applicable, shall monitor and manage employment activities while the employee is assigned to modified duty and until the employee is released to return to his former job duties without restriction.

5.5 Non Work Related Injury / Illness

5.5.1 Upon notification of a non-work related injury or illness, the Supervisor shall notify the EHS Manager as soon as possible. The Supervisor will ensure a Non-Work-Related Injury or Illness Report is completed and forwarded to the EHS Administrator or authorized designee for entry into the database. The employee shall not begin work until the EHS Manager determines that the employee has been released for full duty, if applicable, by the employee's medical service provider and, in some cases, Brandenburg's medical service provider. A copy of the full duty release will be forwarded to the EHS Administrator for filing.

5.6 Third Party Notification

5.6.1 All employee injuries and illnesses shall be reported in accordance with Brandenburg's contractual obligations.

5.6.2 The EHS Administrator shall prepare and submit any government required reports of any employee injury or illness in accordance with applicable laws and regulations.

5.7 Brandenburg Records

5.7.1 The EHS Administrator, or authorized designee, shall enter each of the following completed claim forms into Brandenburg's database:

Employee Injury Claim

Non-Work Related Injury or Illness Report

5.8 Investigations

5.8.1 Accident investigations will be conducted pursuant to our Accident / Incident Reporting and Investigation Policy (SOP 1.18)

6. Forms

6.1 Employee Injury Claim

6.2 Non-Work Related Injury or Illness Report

7. Regulatory / Permit Requirements

Employee injury and illness reporting, posting and record maintenance will be completed in conformity with OSHA requirements

8. Recordkeeping

Claim Reports are maintained as per Claim Form Use, SOP. The OSHA 300 log and 300 A forms shall be updated and maintained by the EHS Administrator per OSHA record keeping requirements.

Title	Date	Reference	Area
Air Monitoring	**7/23/2012**	**1.04**	**Safety**

1. Summary

On certain projects or throughout the year, Brandenburg periodically performs air monitoring to identify and quantify airborne levels of hazardous substances in order to examine, reduce and prevent the migration of contaminants into the environment and surrounding community and to determine the appropriate level of employee protection needed on-site during demolition activities.

2. Scope

All applicable Brandenburg personnel and work sites will be outlined within this procedure as required

3. Definitions

3.1 Active Sampling – The collection of airborne contaminants by means of sampling pump and appropriate sampling media

3.2 Real-Time Monitor – Direct-reading instruments which provide measurement of contaminant concentrations in the field

4. Responsibility

Responsibility of personnel will be outlined within this procedure as required

5. Methods

5.1 General

5.1.1 One individual sampling method may not provide the level of results and accuracy needed to ensure the safety of the workers and surrounding community. Typically, more than one technique may be required to fully evaluate airborne contaminant concentrations.

Active sampling for various agents submitted for laboratory analysis will be collected using OSHA & NIOSH sampling methods. Typical sampling methods follow:

- OSHA method 121/125, NIOSH method 7300 will be used for various metals
- OSHA method 215 will be used for hexavalent chromium
- NIOSH method 7400 will be used for asbestos
- NIOSH method 0600 will be used for respirable dust
- NIOSH method 0500 will be used for total dust
- NIOSH method 7500 will be used for silica

5.1.2 All persons operating instrumentation will be adequately trained,

5.1.3 All instruments will be operated in accordance with manufacturer's requirements,

5.1.4 All instruments will be calibrated in accordance with manufacturer's recommendations,

5.1.5 All instruments will be maintained in accordance with manufacturer's recommendations,

5.1.6 All colorimetric tubes will be checked for expiration dates and will not be used after the expiration date.

5.2 Documentation

All relevant air monitoring data shall be recorded on Brandenburg air sampling data sheets and on a site location map when performing perimeter air sampling. Relevant air monitoring data includes but is not limited to: weather conditions, sampling locations, sampling periods, demolition activities, employee names, calibration data, and sample numbers. Sampling instrumentation equipped with data-logging capabilities and associated software will be downloaded to a computer on a regular basis.

5.3 Personal Exposure Monitoring

Worker exposure monitoring may be conducted during demolition activities and contaminants shall be selected based on the demolition activities being performed. If sampling results indicate workers are exposed to contaminants above regulatory limits, existing engineering and administrative control measures shall be modified or additional control measures shall be implemented to reduce concentrations to acceptable levels. If concentrations cannot be reduced to acceptable levels using said controls, appropriate personal protective equipment (PPE) shall be used. Subsequent air sampling shall be conducted to verify control measure effectiveness.

5.4 Area Monitoring

Air sampling may be conducted at the site fence line or work zone boundaries to evaluate the potential for contaminant migration during demolition activities. Perimeter air monitoring will typically be performed both upwind and downwind. A wind sock or other wind direction indicator may be installed at the site. Sampling locations shall be relocated as necessary to adjust for changing wind patterns.

Fence line monitoring for particulate matter will typically involve the use of a TSI DustTrak™ real-time monitor or similar instrument. Typically, the monitor shall be fitted with filters so as to sample only for PM-10 (particulate matter less than 10 micrometers in diameter). In addition to the real-time particulate fence line monitoring, side-by-side monitoring may be conducted using personal sampling pumps and substance-specific media.

6. Forms

6.1 Industrial Hygiene Data Forms (SAF-42 A-E)

7. Regulatory / Permit Requirements

29 CFR 1926.55

29 CFR 1910.1000

8. Record Keeping

Employee exposure notification records and personal air monitoring records are maintained per Employee Files, SOP and Records Retention Form, QUA-05. In addition, personal air monitoring results are maintained electronically by the Environmental Health & Safety (EHS) Administrator. Hard copy reports are maintained in project files.

Title	Date	Reference	Area
Engineering Survey	**7/23/2012**	**1.05**	**Safety**

1. Summary

An Engineering Survey will be completed prior to the commencement of demolition operations.

2. Scope

All applicable Brandenburg personnel and work sites will be outlined within this procedure as required

3. Definitions

3.1 Engineering Survey – An evaluation of the conditions on a project site in preparation for the development of plans and procedures for structural demolition. Inclusive of an Engineering Survey are surveys of safety, environmental, and commercial.

4. Responsibility

Responsibility of personnel will be outlined within this procedure as required

5. Methods

5.1 General

The Surveys will be completed by a competent person including the Estimator, Environmental Health & Safety (EHS) Manager, Environmental Manager, and Commercial Manager. Other competent persons may complete the Surveys as needed. The Surveys will aid in project planning, and identify specific hazard conditions at the site. The Survey will identify control measures to be implemented to minimize employee exposure to potentially hazardous conditions during demolition, dismantlement, remediation, and renovation activities. An Engineering Survey (EST-03) will be prepared for each structure (or groups of structures where the hazards are the same).

5.2 Utility

Electrical, plumbing (water and sewer), gas and communication systems (phone line, fiber optic, cable TV or other network) and all other utilities will be assessed to identify any required disconnection and/or relocation work to be performed.

5.3 Structural

A visual inspection of the structure will be conducted by a competent person to: assess the integrity of the structure; identify party walls; evaluate floors, stairs, and landings; determine building construction materials (wood, concrete, brick) and identify structural hazards

5.4 Environmental

An assessment of environmental documentation which may exist, such as Phase I, II reports, asbestos surveys, environmental audits, etc… will be performed in order to determine the presence of hazardous materials. A visual inspection will also be conducted to: identify underground storage tanks, asbestos, drums, visual staining, air pollution control equipment, stored chemicals, industrial wastes, transformers, contaminated sumps, and catch basins which could expose employees to hazards requiring special personal protection.

5.5 Required Notifications

Dependent upon the results of the Engineering Survey, certain regulatory agencies may need to be notified. For example, notification is typically required when asbestos or underground tanks are being removed. Written plans may be required for storm water run-off or for other site conditions anticipated.

5.6 Required Licenses and Permits

The Engineering Survey will specify if licenses or permits will be required. These types of licenses may include contractor license and bonds, building permits, street permits to use fire hydrant, required inspections, etc….

5.7 Required Training

The Engineering Survey will indicate when specific training will be required such as HAZWOPER, asbestos, confined space, lead abatement, trenching/excavation, scaffold erection, or other required training.

5.8 Health and Safety

Information gathered from the Survey will be used to identify site hazards and to designate controls to be implemented. Potential site hazards may include, but not be limited to, elevated work, confined spaces, extreme temperatures, fire, electrical, and chemical exposure. The Engineering Survey may not cover all aspects of health and safety. A site-specific Health and Safety Plan (HASP) will be used in conjunction with the Engineering Survey to identify hazards and determine worker protection.

6. Forms

6.1 Engineering Survey (EST-03)

7. Regulatory / Permit Requirements

29 CFR 1926.850(a)

8. Record Keeping

Completed Engineering Survey forms will be retained in the project file.

Title	Date	Reference	Area
Emergency Preparedness	**10/14/2015**	**1.06**	**Safety**

1. Summary

If an emergency occurs, Brandenburg employees will adhere to standard methods of responding. Emergencies may be weather or non-weather related. These procedures have been developed to protect property, project personnel, and the neighboring community potentially affected by: severe weather, high winds, fires or other emergencies that might require emergency action.

2. Scope

All applicable Brandenburg personnel and work sites will be outlined within this procedure as required

3. Definitions

3.1 High Winds - Any wind speed may be considered a high wind condition dependent on the work task

3.2 Severe Weather - Severe weather may be any weather condition that could pose a threat to life and property. Examples of severe weather may include: heavy rains, flooding, thunderstorms producing damaging winds and hail ¾ of an inch or larger in diameter, lightning, fog, tornadoes, blizzards, ice storms and extreme temperature conditions.

4. Responsibility

Responsibility of personnel will be outlined within this procedure as required

5. Methods

General – Should an emergency situation of any type occur, only those persons adequately trained and qualified to do so will be expected to react to the emergency. The treatment for injured persons and control of the situation, including notification of the appropriate emergency services or agencies, will take precedence over the filing of incident reports.

5.1 Severe Weather

The Supervisor will be observant of weather conditions that may pose a threat to life and property.

5.1.1 Lightning

The following precautions will be maintained during lightning conditions:

5.1.1.1 Seek shelter inside a building and/or an enclosed vehicle

5.1.1.2 Workers must stay off and away from anything tall or high, such as structural steel members, pipe racks, roof tops, scaffolding, ladders, heavy equipment, process columns, antennas, etc.

5.1.1.3 Workers must not group together and/or huddle under or near tall structures.

5.1.1.4 Workers must avoid a depression with standing or running water or a stream.

5.1.1.5 All booms must be lowered to the ground or retracted to the shortest boom length.

5.1.2 Other Severe Weather

The Supervisor will determine when severe weather or high winds are creating a hazard to workers or work being performed, i.e., instability in elevated areas, limited visibility due to dust or particles in the air, unmanageable materials, etc... In the event that the Supervisor deems the weather to be too severe to safely continue working, and no substitute work can be performed, the following precautions will be followed:

5.1.2.1 Work activities will be stopped,

5.1.2.2 Workers and work areas will be re-assigned to a safe area or dismissed,

5.1.2.3 Material that might blow away, injure or become damaged will be properly stored and secured when feasible,

5.1.2.4 Workers will await further instruction from their Supervisor.

5.1.3 Tornado

A **tornado watch** is issued by the National Weather Service when tornadoes are possible in your area. Remain alert for approaching storms. A **tornado warning** is issued when a tornado has been sighted or indicated by weather radar.

Tornado Danger Signs
Learn these tornado danger signs:

- An approaching cloud of debris can mark the location of a tornado even if a funnel is not visible.
- Before a tornado hits, the wind may die down and the air may become very still.
- Tornadoes generally occur near the trailing edge of a thunderstorm. It is not uncommon to see clear, sunlit skies behind a tornado.

5.1.3.1 In the event that the Supervisor deems that a tornado warning is in the area, the following measures will be followed:

5.1.3.1.1 Stop work and proceed to the pre-designated tornado shelter. Each Office will have a pre-selected area identified by a 'Tornado Shelter' sign.

If you are not able to access the shelter area, go to the center of an interior room on the lowest level (closet, interior hallway) away from corners, windows, doors and outside walls. Avoid places with wide-span roofs such as cafeterias and large hallways.

5.1.3.1.3 If outside with no shelter, immediately get into a vehicle, buckle your seat belt and try to drive to the closest sturdy structure. Stay in the car with the seat belt on, put your head down below the windows, and

cover your head with your hands and a blanket, coat or other cushion if possible. Do not get under an overpass or bridge. You are safer in a low, flat location.

5.1.3.2 After the Tornado. The Supervisor will assess the conditions. Be aware of structural, electrical or gas-leak hazards.

5.1.3.2.1 Check for injuries. Do not attempt to move seriously injured people unless they are in immediate danger of further injury. Get medical assistance immediately.

5.1.3.2.2 Do not touch downed power lines or objects in contact with downed lines. Report electrical hazards to the police and utility company.

5.2 Fires / Explosion

All fires will be reported immediately. If the fire is too large, or a potential exists for the fire to get out of control, the worker will immediately leave the area, contact his Supervisor, sound the alarm, or otherwise follow the emergency response plan as specified in the site-specific Health and Safety Plan (HASP).

Brandenburg workers may respond to a fire / explosion situation in accordance with their training and experience. Only those workers appropriately trained to handle incipient fires shall attempt to extinguish the fire. Once the fire has been extinguished, the worker will inform his Supervisor who will subsequently notify all site personnel.

5.3 Other Emergencies

5.3.1 Situations such as leaks (liquid or solid materials) and releases (such as gases, vapors or mists) must be reported immediately. Brandenburg workers may respond to these types of emergencies in accordance with their training and experience. Should the situation be serious in nature, the worker must leave the area and contact his Supervisor immediately.

5.4 Worksite Evacuations

5.4.1 The Supervisor will determine if a worksite evacuation of site personnel is necessary. Brandenburg will not order local residents or others to evacuate, but will assist and cooperate with public emergency personnel such as Police, Fire Department, ESDA, HAZMAT or others as necessary.

5.4.2 The following evacuation precautions will be maintained:

5.4.2.1 If Brandenburg is working on an active customer site that has a current evacuation plan, Brandenburg will adhere to that plan.

5.4.2.2 If no customer plan is in effect, Brandenburg will advise workers of an evacuation plan as specified in the HASP.

5.4.3 Following the announcement of an evacuation the following will occur:

5.4.3.1 Upon receiving instructions to assemble, all workers will secure their work area.

5.4.3.2 All Brandenburg personnel shall proceed to the pre-determined assembly areas in a calm, orderly manner.

5.4.3.3 All radio traffic will be confined to emergency communications only.

5.4.3.4 Telephone lines will be used only by those authorized to use them for the purpose of dealing with the emergency.

5.5 Securing a Work Area

5.5.1 Securing a work area may include but is not limited to the following:

5.5.1.1 All motorized equipment, welding equipment, and burning equipment will be shut down.

5.5.1.2 All gas, diesel, propane, electrical, open flame and other powered equipment will be shut down immediately.

5.5.1.3 All issued work permits in the affected area will no longer be valid.

5.5.1.4 All electrically powered tools will be disconnected from their power source.

5.5.1.5 Employees assigned to motorized equipment/vehicles will park off the site roads and clear of fire-protection devices, i.e., hose houses, hydrants, and Post Indicator (PI) fire water control valves.

NOTE: No vehicles, other than emergency vehicles, will be driven on the site in an emergency.

5.6 Accountability

5.6.1 If deemed necessary by Brandenburg or required by the customer, maps indicating evacuation alarms and routes will be developed and placed in the site-specific HASP and posted in a conspicuous location on the project.

5.6.2 All Supervisors will wait for their employees in the assembly areas.

5.6.3 Supervisors will ensure all employees working in remote areas and in confined spaces have been alerted and have proceeded to the assembly area.

5.6.4 Supervisors will conduct a roll call of their employees.

5.6.5 Employees are not to leave the assembly area until authorized to do so by their Supervisor

5.6.6 No attempt will be made to locate missing employees until it is determined that a search and rescue party can be reasonably protected during such a search.

5.6.7 Information such as emergency telephone numbers will be immediately available.

5.7 Emergency Evacuation Drills

5.7.1 Brandenburg will conduct annual emergency evacuation drills at office and shop / yard locations and on project sites.

5.7.2 The Supervisor or designated EH&S Manager is responsible for conducting and documenting (SAF-64) emergency evacuation drills, obtaining feedback from employees and discussing suggested improvements when applicable.

6. Forms

6.1 Emergency Evacuation Drill Report (SAF-64)

6.2 Brandenburg Claim Form(s)

7. Regulatory / Permit Requirements

None

8. Record Keeping

Claim reports are maintained per Claim Form Use, SOP. Any additional incident reports pertaining to site emergencies will be maintained in the project file.

Title	Date	Reference	Area
Security	**7/23/2012**	**1.07**	**Safety**

1. Summary

General rules have been established to protect the welfare of Brandenburg, Brandenburg employees, subcontractors and customers. These rules must be adhered to.

2. Scope

All applicable Brandenburg personnel and work sites will be outlined within this procedure as required

3. Definitions

None

4. Responsibility

Responsibility of personnel will be outlined within this procedure as required

5. Methods

All general security measures must be followed. Since a large portion of Brandenburg work is performed at active customer sites, the security measures that will be followed will be the more stringent than Brandenburg requirements. General Brandenburg requirements are outlined below. These requirements must be adhered to unless there is a conflict with customer requirements.

5.1 Parking

Parking will be permitted in designated areas only. If deemed necessary by Brandenburg management, signs will be posted listing the authorized companies and rules governing the use of the area. All vehicles on the property will be at the risk of the vehicle owner. Neither the customer, nor Brandenburg, accepts responsibility for damage to or theft of or from such vehicles.

5.2 Designated Entrances

Brandenburg workers will only use the designated entranceways for entry or exit.

5.3 Walks and Roadways

Personnel will only use designated walks and roadways when entering or leaving the job site, when moving from one area to another, or when obtaining material. The use of short cuts or pathways which are not designated is prohibited.

5.4 Identification

If customer badges are required, all personnel shall wear their badges at all times when on the worksite.

5.5 Material Passes

Tools, equipment and materials cannot be removed from the site without permission from the Supervisor. Should the situation arise, Brandenburg will conform to any customer requirements for material passes.

5.6 Searches of Persons and/or Property

Brandenburg and/or the customer reserve the right for the search of person and/or property of Brandenburg employees and subcontractor(s), vendors and visitors while on Brandenburg or customer property.

5.7 Cameras

Cameras are prohibited without the consent of Brandenburg. Brandenburg will conform to any customer requirements regarding camera use.

5.8 Traffic Regulations

5.8.1 Equipment Required on Motor Vehicles

All motor vehicles on the worksite must be in safe operating condition. When entering the worksite, if required, all motor vehicles must display a valid state inspection sticker on the windshield. For vehicles not requiring a state inspection sticker or from out of state, the following equipment must be in proper working condition for the vehicle to be considered safe: (1) brakes; (2) lights - two headlights; tail lights, brake lights; (3) horn; (4) muffler; (5) safety glass; (6) windshield wiper and rear mirror. Vehicles having dual wheels shall be equipped with suitable flaps on each dual wheel so that objects will not be ejected past the flaps, to the rear, when the vehicle is in motion.

5.8.2 Warning Flags

Red flags, warning signs or escorts may be used on any load that extends beyond the front, side, or rear of any vehicle.

5.8.3 Traffic Signs

All traffic signs and signals, whether fixed or portable, shall be obeyed, and drivers must cooperate with representatives appointed to direct traffic.

5.8.4 Speed Limit

All vehicles shall be operated within the worksite posted speed limits.

5.8.5 Driving and Parking

Vehicles shall be driven on the correct side of the street and be parked in areas designated for Brandenburg employee parking. Vehicles shall not be parked in such a manner as to slow down, hinder, or interfere with the free flow of traffic. Vehicles shall not be parked so as to block or interfere with the use of fire hydrants or fire equipment.

5.8.6 Right-of-Way

All motor vehicles shall give right-of-way to pedestrians, bicycles, ambulances, and firefighting equipment. Defensive driving and ordinary driving courtesy shall be practiced by all drivers of motor vehicles.

5.8.7 Passengers

Drivers of motor vehicles will not permit passengers to ride on fenders, running boards, tops, or bumpers of motor vehicles. Passengers will keep all parts of their bodies inside the cab or body of vehicles and must be seated while vehicle is in motion. Tailgates must be kept raised. Passengers will not get on or off a vehicle while it is in motion.

5.8.8 Windshield or Window Obstruction

Vehicles having nontransparent materials which interfere with clear visibility through any side window or windshield will not be operated at the worksite. All vehicles will be equipped with adequate rear-view devices. Vehicles or equipment with an obstructed view to the rear will be equipped with a back-up alarm.

5.8.9 Obstructing Streets, Roads, Fire Equipment or Fire Fighting Facilities

Except in emergency situations, no one will block roads/streets. When a contractor's work obstructs a road or street, the contractor shall provide approved lights, barriers, warning devices, or signalmen. Fire equipment, fire fighting facilities, and fire hydrants must not be blocked by parked vehicles.

6. Forms

None

7. Regulatory / Permit Requirements

None

8. Record Keeping

Any / all security related items will be kept in the project file.

Title	Date	Reference	Area
Subcontractor Safety	**11/01/2014**	**1.08**	**Safety**

1. Summary

All subcontractors working on any Brandenburg site will perform work in a safe and healthful manner. Brandenburg will use subcontractors qualified and approved to perform work. All subcontractors must demonstrate the existence of a health and safety program. Unsatisfactory performance in the area of safety and health will disqualify a subcontractor from working for Brandenburg.

2. Scope

Applies to select subcontractors working on Brandenburg projects

3. Definitions

None

4. Responsibility

Responsibility of personnel will be outlined within this procedure as required

5. Methods

5.1 Performance of Site Work

All subcontractors are required to perform all work in a safe and healthful manner. They must abide by all applicable regulations, their own company's safety policies and procedures, and all applicable Brandenburg safety policies and procedures. This includes adherence to the scope of work and site-specific Health and Safety Plan (HASP) in accordance with contract requirements.

5.2 Reporting of Incidents

Subcontractors must immediately report all incidents to Brandenburg's Supervisor or designated contact. NOTE: Incidents include but are not limited to near misses, unsafe acts, personal injuries and property damage.

5.3 Subcontractor Safety Representative.

5.3.1 The subcontractor will designate a competent person who will be on-site at all times. The competent person will ensure that job site safety requirements and procedures are being accomplished by conducting safety inspections of work being performed.

5.3.2 The subcontractor's competent person will conduct safety meetings with workers and submit a report to Brandenburg documenting safety activities when requested.

5.3.3 The subcontractor's competent person will also be responsible for a continuing survey of its operations to ensure that operating equipment, tools and facilities are used, inspected and maintained as required by applicable safety and health regulations.

5.4 Safety Plan / Program

The subcontractor will have in effect a safety program and will designate a competent person. The subcontractor's competent person will be responsible for implementing the Safety Program.

5.5 Personnel Qualifications

The subcontractor is responsible and must ensure that personnel are: qualified, medically fit, and appropriately trained to perform the work.

5.6 Subcontractor Qualifications

Subcontractors performing work for Brandenburg must complete the Subcontractor Safety Qualification Form (SAF-21A). This report contains information regarding the subcontractor's health and safety program.

5.6.1 The Commercial Department representative shall forward the Subcontractor Safety Qualification Form (SAF-21A) to the designated subcontractor representative for completion and subsequent submission to Brandenburg's Environmental Health & Safety (EHS) Administrator.

5.6.2 The (EHS) Administrator will review the Subcontractor Safety Qualification submittal and determine those subcontractors who are qualified to perform work.

5.6.2.1 Review elements include the subcontractor's documented safety program, historical OSHA Injury / Illness rates and regulatory compliance history.

5.6.2.1.1 Subcontractors who do not have a documented safety program will be required to adopt the policies and procedures outlined in Brandenburg's site-specific Health and Safety Plan (HASP).

5.6.2.1.2 The subcontractor will submit written acknowledgment of this requirement on Brandenburg's Subcontractor Acknowledgment Form (SAF-21C).

5.6.3 Subcontractors meeting qualification requirements shall be approved until the end of the calendar year in which their submittals were received.

5.7 Subcontractor Approval Process

5.7.1 Subcontractors will be considered approved by the EHS Administrator when their safety programs include the following:

5.7.1.1 Documented safety program <u>or</u> a completed Written Acknowledgment form of Brandenburg's Site-Specific Health and Safety Plan (HASP)

5.7.1.2 OSHA 300 A forms for previous (3) calendar years, when applicable

5.7.1.3 OSHA Recordable Incident Rates (ORIR) at or below their respective industry average (prior year <u>or</u> 3 yr average), when applicable

5.7.1.4 No regulatory citations, or no more than (3) Serious citation in the previous 3 years

5.7.2 Subcontractors will require management approval when the EHS Administrator's review of their safety programs reveals following:

5.7.2.1 OSHA Recordable Incident Rates (ORIR) above their respective industry average (prior year or 3 yr average)

5.7.2.2 (3) or more Serious citations in the previous (3) years

5.7.2.3 A fatality in the previous (3) years

5.8 Subcontractor Project Safety

5.8.1 Brandenburg's designated project Environmental Health & Safety (EHS) Manager shall review subcontractor's site safety program and provide assistance, as needed, to ensure compliance with project site safety procedures.

5.8.2 Subcontractors shall be included during Project Safety Inspections.

5.9 Subcontractor Re-Qualification Process

5.9.1 During the last month of each calendar year, the EHS Administrator will forward the Approved Subcontractor List to each division's Commercial Department for review. The Commercial Department(s), in turn, will provide the EHS Administrator with a list of preferred subcontractors to be re-qualified for work during the next calendar year.

5.9.2 The EHS Administrator shall forward the Subcontractor Safety Re-Qualification form (SAF-21B) to the designated subcontractor representative for completion and return.

5.9.3 The EHS Administrator shall review the completed submittal and determine re-qualification status. Review may include Subcontractor Evaluation Scorecards (QUA-20) for work completed for Brandenburg during the current calendar year.

5.9.4 Subcontractors shall be re-qualified annually.

6. Forms

6.1 Subcontractor Safety Qualification Form (SAF-21A)

6.2 Subcontractor Safety Re-Qualification Form (SAF-21B)

6.3 Subcontractor Written Acknowledgment Form (SAF-21C)

6.4 Subcontractor Evaluation Scorecard (QUA-20)

7. Regulatory / Permit Requirements

None

8. Record Keeping

Subcontractor Safety Qualification and Re-Qualification submittals will be maintained by the EHS Administrator. Where required, submitted safety meeting documentation will be maintained in the project files.

Title	Date	Reference	Area
Site Specific Health and Safety Plan	**7/23/2012**	**1.09**	**Safety**

1. Summary

A site-specific Health and Safety Plan (HASP) will be developed for each project site as a planning tool. The HASP, in conjunction with the Engineering Survey, is used to identify, evaluate, control and communicate site hazards so that accidents are prevented. The HASP will also include an emergency contingency plan.

2. Scope

All applicable Brandenburg personnel and work sites will be outlined within this procedure as required

3. Definitions

None

4. Responsibility

Responsibility of personnel will be outlined within this procedure as required

5. Methods

5.1 General

The Environmental Health & Safety (EHS) Manager or qualified designee will develop a site-specific HASP for each project site. The contents of this plan will provide specific information pertinent to the site.

The contents of the site-specific HASP may include, but are not limited to, the following:

5.1.1 An Introduction

5.1.2 HASP Objective

5.1.3 Organization of Site Safety

5.1.4 Administrative Safety & Health

5.1.5 Safety Programs to be implemented

5.1.6 Exposure Controls & Chemical Hazards

5.1.7 Site Access & Control

5.1.8 Site Safety Inspection System

5.1.9 Hospital / Clinic Information & Directions

5.1.10 Site Orientation Acknowledgement Form (when required by the customer)

5.1.11 Completed Task Safety Analyses (TSA)

5.2 Plan Availability

A copy of the site-specific HASP will be available at each project site.

5.3 Other Plans or Requirements

Should a conflict arise between content of plans, the more protective measures will be followed unless other arrangements have been agreed upon.

5.4 Occupational Health Facilities

Designated Occupational Health Clinics shall be identified prior to commencement of work.

6. Forms

6.1 Project Health and Safety Plan (HASP) – (SAF-53)

7. Regulatory / Permit Requirements

29 CFR 1926.20-21

8. Recordkeeping

All site-specific HASPs will be kept on file in the project files.

Title	Date	Reference	Area
General Safety Rules – Visitors	**11/01/2014**	**1.10**	**Safety**

1. Summary

All visitors to Brandenburg work sites must comply with safety rule requirements. These general requirements are set forth below. Besides the general rules as set forth below, safety requirements for each Brandenburg project will be addressed in a site-specific Health and Safety Plan (HASP). When a conflict exists between a general rule and a site-specific HASP requirement, the more stringent or protective rule/requirement will apply.

2. Scope

All applicable Brandenburg visitors and work sites will be outlined within this procedure as required

3. Definitions

None

4. Responsibility

Responsibility of personnel will be outlined within this procedure as required

5. Methods

5.1 The following work rules shall apply to all visitors:

5.1.1 The site Supervisor will provide all visitors an orientation/briefing prior to being allowed access to Brandenburg work areas.

5.1.2 After completing orientation, visitors will be allowed to observe at a safe distance (as determined by Brandenburg) ONLY when accompanied by a Brandenburg representative.

5.1.3 Visitors will be denied access unless they are wearing a hard hat, safety glasses, and sturdy closed-toe leather shoes.

5.1.4 Visitors are never allowed access to areas requiring greater than level “D” protection unless they can provide documentation they are properly trained and medically qualified.

6. Forms

None

7. Regulatory / Permit Requirements

None

8. Recordkeeping

None

Title	Date	Reference	Area
Safety and Health Training	**5/15/2013**	**1.11**	**Safety**

1. Summary

Safety and Health training is a foundational element of Brandenburg's Safety Program. All workers will be adequately trained to perform their assigned job functions. Training is provided to increase workers' job knowledge and to prevent accidents and illness.

2. Scope

All applicable Brandenburg personnel and work sites will be outlined within this procedure as required

3. Definitions

3.1 Supervisor - The Supervisor at a project site is the person at the project site assigned to represent the Company. The Supervisor may be hourly or salaried. The Supervisor may also be known as Leadman, Foreman, Superintendent, Field Engineer, Project Manager or other designation indicating responsibility for management of site workers.

4. Responsibility

Responsibility of personnel will be outlined within this procedure as required

5. Methods

5.1 Worker Training - General

5.1.1 All new hire employees shall receive "New Employee Orientation" training. New Employee Orientation training will be presented by an Environmental Health & Safety (EHS) Manager or his authorized designee. New Employee Orientation is more fully described in SOP 1.02, New Employee Orientation.

All field employees shall receive Demolition Specific OSHA 10 Hour Construction Outreach training. In most cases, Demolition Specific OSHA 10 Hour Construction Outreach training should be completed within the first six months of their job assignment.

5.1.2 The training program will be evaluated periodically to determine effectiveness. Various methods may be employed including: Supervisor observations, employee observations, workplace improvements, safety inspections, accidents, injury claims, OSHA compliance, near miss incidents, and employee surveys. The evaluations will be used to modify and enhance the training program and to ensure that each employee employs and retains sufficient knowledge to perform his job safely.

5.2 Worker Training – Site-Specific

5.2.1 Prior to each project start-up, the Supervisor will receive a site-specific Health and Safety Plan (HASP), and an Engineering Survey. The Supervisor will use these documents to inform workers of the site hazards and appropriate procedures to follow in order to prevent accidents. These plans will contain a listing of required site-specific training requirements. The Supervisor will verify that all workers have successfully completed training requirements for their job.

5.2.2 The EHS Manager or his designee will assist the Supervisor by presenting a line-up meeting at the beginning of each project. Workers assigned to the project will be oriented upon their arrival on-site.

5.2.3 The Supervisor will present a daily safety meeting to discuss the safety issues, potential hazards and control measures to be implemented. Further training (weekly or other) may be performed as outlined in the HASP.

5.2.4 The Supervisor will initiate “On the Job Training” stressing safety related to tasks, such as hand demolition, field burning scrap, sorting scrap, and working adjacent to heavy equipment.

5.2.5 All workers will be required to successfully complete general and site specific training as required by the site-specific HASP. This training may include, but is not limited to, the following subject material:

Aerial Lift	Arsenic Awareness
Asbestos Awareness	Blood Borne Pathogens
Cadmium Awareness	Confined Space
Crane Operation & Responsibility	Crane Suspended Personnel Platform
Demolition	Electrical Hazards
Emergency Evacuation	Excavation
Fall Protection	Fire Prevention / Fire Fighting
Hazard Communication	Hazardous Waste Operations
Hand & Power Tools	Hearing Conservation
Hexavalent Chromium	Ladder Use & Care
Lead	Lock-Out / Tag-Out
Material Handling	PCB Awareness
Personal Protective Equipment	Powder Actuated Tools
Process Safety	Railroad Car Movement
Respirator Use & Care	Rigging
Scaffolding	Silica Awareness
Skid Steer Loader	Temperature Stress
Torch Safety	Underground Utilities

Note: The above list is not considered to be all inclusive. Additional training may be required due to Site Conditions, Scope of Work, or Customer requirements.

5.3 Supervisor Training - General

All supervisory personnel will be trained on our corporate Safety Policy, Objectives & Targets. Every field Supervisor will successfully complete the 30 hour OSHA Safety Standards Construction course and be First Aid / CPR trained.

5.4 Supervisor Training - Specific

Training for all field supervisory personnel will include all subjects for which they are responsible as specified in the site-specific HASP. For example, if the Supervisor is responsible for a HAZWOPER job, he will have successfully completed 40 Hour HAZWOPER training (and an up-to-date refresher course) along with 8 Hour HAZWOPER Supervisor training.

If the Supervisor is responsible for an asbestos job, he will have completed Asbestos Supervisor training. If the Supervisor is responsible for scaffolding, he will be trained as a competent scaffold person. If the job entails rigging, the Supervisor will be trained in rigging procedures. The Supervisor may also be required to have successfully completed training in other subjects such as those listed in section 5.2 above or other training pertinent to the work assignment.

5.5 Environmental Health & Safety (EHS) Manager - General

EHS Managers will have successfully completed the OSHA Outreach Construction Trainer course (#500) once all prerequisites are met; the 40 Hour HAZWOPER course, and the 8 Hour HAZWOPER Supervisor course.

5.6 Environmental Health & Safety (EHS) Manager - Specific

EHS Managers may need additional training depending on the needs of the specific project and the assignments for which they are responsible. This training may include, but is not limited to, subjects specified in section 5.2 above.

6. Forms

6.1 Daily Project Report (OPS-06)

6.2 Employee Training Matrix.Safety (SOP)

7. Regulatory / Permit Requirements

None

8. Record Keeping

Employee training records will be maintained as per Employee Files, SOP and per Records Retention Form, QUA-05.

Title	Date	Reference	Area
Medical Surveillance	**7/23/2012**	**1.12**	**Safety**

1. Summary

To ensure that all workers will be medically fit to perform their assigned duties, Brandenburg has developed a medical surveillance program. Brandenburg uses physicians or other Licensed Health Care Professionals (PLHCP) to ensure medical fitness prior to working, and at various times during employment.

2. Scope

All applicable Brandenburg personnel and work sites will be outlined within this procedure as required

3. Definitions

None

4. Responsibility

Responsibility of personnel will be outlined within this procedure as required

5. Methods

5.1 Medical Examinations

5.1.1 Pre-employment

Pre-employment examinations are administered to pre-qualify personnel prior to their employment at Brandenburg. Examination components are selected based on the requirements of the position for which the individual has applied. These components may include other tests or examinations required by the examining physician based on the applicant's medical history or medical observations made during the examination. Whenever feasible, pre-employment physical exams will be provided to applicants a minimum of seven (7) working days prior to the date of hire.

5.2 Periodic Examinations

Periodic examinations may be administered to employees based on their job task assignments to ensure personnel are capable of performing the essential functions of their jobs, to prevent occupationally related diseases, and to comply with applicable regulations. Types of periodic examinations include:

5.2.1 Baseline Examinations

Examinations scheduled prior to an employees work assignment to determine the employees medical qualification to perform the essential physical requirements of the job.

5.2.2 Annual Examinations

Examinations scheduled on an annual basis to determine the employee's medical qualification to perform the essential physical requirements of the job.

5.2.3 Examinations (Truck Drivers):

DOT examinations, including random and scheduled drug and alcohol testing, are to be provided in accordance with applicable regulations. Drivers will take an initial physical prior to employment and every other year thereafter.

5.2.4 Special Examinations:

Special examinations may be required following an accident or injury, for a specific project, or for any purpose necessary to prevent or mitigate the potential for occupational injury or disease.

5.2.5 Exit examinations

Exit or “post employment” examinations may be offered to employees based on their employment history, following termination from Brandenburg.

5.3 Examination Content

Examination components are outlined on Brandenburg’s Employment Physical Authorization Form (HRM-02).

5.3.1 The following is a list of medical examinations provided by Brandenburg:

5.3.1.1 Laborer – Pre-Placement

5.3.1.2 Laborer – Annual

5.3.1.3 Operator/Mechanic/Welder/Superintendent – Pre-Placement

5.3.1.4 Operator/Mechanic/Welder/Superintendent/Driver – Annual

5.3.1.5 Asbestos Laborer/Operator/Mechanic/Welder/Superintendent – Pre-Placement

5.3.1.6 Asbestos Laborer/Operator/Mechanic/Welder/Superintendent/Driver – Annual

5.3.1.7 Driver – Pre-Placement

5.3.1.8 Driver Asbestos – Pre-Placement

5.3.1.9 Driver – 2 Year DOT Medical Certification

5.3.1.10 Driver Asbestos – 2 Year DOT Medical Certification

5.3.1.11 Executive

6. Forms

None

7. Regulatory / Permit Requirements

29 CFR 1926.62 (j)

29 CFR 1926.1101 (m)

29 CFR 1910.134 (e)

8. Record Keeping

Employee medical records will be maintained as per Employee Files SOP and per Records Retention Form, QUA-05. Brandenburg will insure the confidentiality of all medical records. Upon written request by an employee or designated representative, copies of medical records will be provided within a reasonable amount of time.

Title	Date	Reference	Area
Modified Duty Work Policy	**7/23/2012**	**1.13**	**Safety**

1. Summary

To promote the healing process, Brandenburg encourages all employees who have sustained a work-related illness/injury which prevents them from performing their regular duty work activities to participate in our modified duty program. At the discretion of Brandenburg management and, on a case by case basis, Brandenburg will attempt to provide employees with work that they can perform within their specified work restrictions.

2. Scope

All applicable Brandenburg personnel and work sites will be outlined within this procedure as required

3. Definitions

3.1 Modified Duty – Temporary alternative work that accommodates medical restrictions prescribed by a physician

4. Responsibility

Responsibility of personnel will be outlined within this procedure as required

5. Methods

5.1 Determination of Medical Restriction

Brandenburg's approved physician, or other physician (as required by statute) will determine the extent of the medical restriction. This determination will be described in a documented work release and submitted by the injured employee to his or her Supervisor. The employee is required to submit work release reports immediately following every medical appointment.

5.2 Communicating Availability of Modified Duty

The injured employee and the Environmental Health & Safety (EHS) Manager or Environmental Health & Safety (EHS) Administrator are responsible for informing the treating physician of the availability of modified duty work assignments.

5.3 Determination of Available Work

The Supervisor, with input from the EHS Manager, will determine if modified duty work is available to accommodate the medical restriction. If modified duty is available, the employee will be encouraged to participate in the modified duty program.

5.4 Conflict Resolution

Should a conflict arise between the worker's current physical capabilities and the worker's temporary medical restriction(s), a detailed job description of the modified duty assignment will be submitted to Brandenburg's (or other) approved physician. Written clarification by the physician to resolve any conflicts will be required prior to allowing the employee to return to work in any capacity.

5.5 Refusal to Participate

An employee's refusal to participate in Brandenburg's Modified Duty Work Program may result in the termination of his or her workers' compensation Temporary Total Disability (TTD) benefits, if applicable.

6. Forms

None

7. Regulatory / Permit Requirements

None

8. Record Keeping

The Supervisor or EHS Manager will notify the EHS Administrator of both commencement and termination of the modified duty work assignment.

Title	Date	Reference	Area
Disciplinary Action Policy	**7/23/2012**	**1.14**	**Safety**

1. Summary

In an effort to promote safe work practices, Brandenburg has implemented a Disciplinary Action Policy that addresses unacceptable employee actions and behaviors. As safety is an integral part of all Brandenburg projects, employees are required to comply with all Safety & Health policies. Supervisor commitment to achieving safety goals includes enforcement of strict adherence to all safety policies, including implementation of disciplinary action. Any employee who fails to comply with Brandenburg's Safety Program, either by choice or by negligence, shall be disciplined according to this policy.

2. Scope

All applicable Brandenburg personnel and work sites will be outlined within this procedure as required

3. Definitions

3.1 Safety Rules & Regulations - As outlined in Brandenburg's New Employee Safety Orientation documentation, General Safety Rules (SOP 1.10), Safety Manual Standard Operating Procedures (SOPs), and any additional customer safety rules and requirements.

3.2 Safety Violations

3.2.1 <u>Minor Violation</u>

3.2.1.1 Result of unacceptable employee actions or behaviors which are not considered to be an immediate danger to the life or health of the employee or others

3.2.1.2 Examples include: absenteeism, misuse of tools, failure to report an injury immediately, etc…

3.2.2 <u>Major Violation</u>

3.2.2.1 Result of unacceptable employee actions or behaviors which are considered to be "Immediately Dangerous to Life or Health" (IDLH) of the employee or others

3.2.2.2 Examples include: failure to adhere to rules regarding fall protection, confined space entry, electrical safety, misuse of heavy equipment, etc…)

3.2.2.3 Occurrence of two or more Minor Violations simultaneously

4. Responsibility

Responsibility of personnel will be outlined within this procedure as required

Title	Date	Reference	Area
Disciplinary Action Policy	**7/23/2012**	**1.14**	**Safety**

5. Methods

5.1 Disciplinary Actions for Minor Safety Violations**

5.1.1 First Violation

5.1.1.1 Written warning

5.1.2 Second Violation

5.1.2.1 Suspension for the remainder of the day and up to three additional days, without pay

5.1.3 Third Violation

5.1.3.1 Termination

5.2 Disciplinary Action for Major Safety Violations**

5.2.1 First Violation

5.2.1.1 Suspension for the remainder of the day, without pay

5.2.2 Second Violation

5.2.2.1 Suspension for the remainder of the day and three additional days, without pay

5.2.3 Third Violation

5.2.3.1 Termination

5.3 ** Any single occurrence of a Minor <u>or</u> Major Violation may result in immediate termination at the discretion of the employee's immediate Supervisor, an Environmental Health & Safety (EHS) Manager or higher level Supervisor.

6. Forms

6.1 Disciplinary Action Claim

7. Regulatory / Permit Requirements

None

8. Record Keeping

Disciplinary Action Claim forms are maintained per Employee Files, SOP.

Title	Date	Reference	Area
Contractor Process Safety Management	**7/23/2012**	**1.15**	**Safety**

1. Summary

All Brandenburg employees working on any Brandenburg site will perform all work in a safe and healthful manner. It is Brandenburg's policy to follow all safety regulations outlined in OSHA's Standard for Process Safety Management (PSM) of Highly Hazardous Chemicals. By meeting or exceeding these regulations, we are attempting to prevent or minimize consequences of a catastrophic release of toxic, reactive, flammable or explosive chemicals.

2. Scope

All applicable Brandenburg personnel and work sites will be outlined within this procedure as required

3. Definitions

None

4. Responsibility

Responsibility of personnel will be outlined within this procedure as required

5. Methods

5.1 Brandenburg Responsibilities

5.1.1 Brandenburg shall ensure that all employees working at a PSM regulated facility are trained in the work practices necessary to safely perform their job.

5.1.2 Brandenburg shall ensure that all employees are instructed in the known potential fire, explosion, or toxic release hazards related to their job and the process, and the applicable provisions of the emergency action plan.

5.1.3 Brandenburg shall document that each employee has received and understood the training. Brandenburg shall prepare a record which contains the identity of each employee, the date of training, and the means used to verify that the employee understood the training.

5.1.4 Brandenburg shall assure that each employee follows the safety rules of the facility including the safe work practices developed and implemented by the facility for the control of hazards during operations such as lockout / tagout (LOTO); confined space entry; opening process equipment or piping; and control over entrance into the facility.

5.1.5 Brandenburg shall advise the facility of any unique hazards presented or found by their work.

5.2 Hot Work Permits

5.2.1 Should hot work be required in a covered process area, a Hot Work Permit will be requested of the owner by the Supervisor to ensure that adequate precautions have been taken to avoid a fire/explosion

5.2.2 The Hot Work Permit will be issued to the Supervisor and available for review by the Environmental Health & Safety (EHS) Manager during routine inspections

5.3 Incident Investigations

5.3.1 All incidents which resulted in, or could reasonably have resulted in, a catastrophic release of a highly hazardous chemical in the workplace involving Brandenburg shall be immediately reported to the owner and an investigation initiated not later than 48 hours after the incident.

5.3.2 A Brandenburg representative who is knowledgeable in the process involved will participate on the incident investigation team

6. Forms

None

7. Regulatory / Permit Requirements

29 CFR 1926.64

29 CFR 1910.119

8. Record Keeping

Claim Reports shall be maintained as per Claim Form Use, SOP. Employee training records, as well as other project-specific documentation, will be maintained per Employee Files, SOP and Records Retention Form, QUA-05.

Title	Date	Reference	Area
First Aid - CPR	**7/23/2012**	**1.16**	**Safety**

1. Summary

Brandenburg is able to provide first aid treatment for workers assigned to its projects. Brandenburg's supervisory personnel are trained in First-Aid response, Cardio Pulmonary Resuscitation (CPR), and Bloodborne Pathogens. They are designated first responders for any emergency medical incidents occurring on a Brandenburg project. As a precaution, in the event of a serious injury, emergency medical treatment facilities are to be in place prior to the start of project work activities.

2. Scope

All applicable Brandenburg personnel and work sites will be outlined within this procedure as required

3. Definitions

3.1 Near Proximity (Reasonably Accessible) – Emergency care must be available within no more than 3-4 minutes from the workplace.

4. Responsibility

Responsibility of personnel will be outlined within this procedure as required

5. Methods

5.1 Medical Attention

5.1.1 The Environmental Health & Safety (EHS) Manager has the responsibility to locate a medical facility that is reasonably accessible or in near proximity to the workplace and able to provide medical treatment for workers.

5.1.2 The medical facility name, address, telephone number and a map with directions shall be listed in the project's site-specific Health and Safety Plan (HASP).

5.1.3 Should an emergency situation of any type occur, only those persons adequately trained and qualified to do so will be expected to react to the emergency

5.1.4 Obtaining proper treatment for injured persons and control of the situation, including notification of the appropriate emergency services or agencies, will take precedence over the filing of incident reports.

5.2 First Aid Program

5.2.1 Program Supervision

Various supervisory staff are trained in first-aid and CPR. Payroll Agents are responsible for maintaining a current list of certified responders. In the absence of a medical facility that is reasonably accessible to the project, Brandenburg will ensure at least one member of our site management is trained and certified in First Aid and CPR.

5.3 First Aid Supplies

5.3.1 A properly stocked first aid kit shall be available on all Brandenburg worksites so that it is easily accessible in the event of an emergency. The Supervisor or designee has the responsibility to inspect the first aid kit on a weekly basis to ensure that the expended items are replaced. Any missing inventory is to be restocked as soon as possible.

5.3.2 Transporting Injured Workers

The Supervisor shall be aware of and have posted in a conspicuous location the emergency telephone numbers for the local ambulance, police and fire departments.

5.3.2.1 The Supervisor or his designee has the responsibility of transporting an injured worker to the designated medical facility in the event an ambulance is not available.

5.3.2.2 An injured worker is prohibited from traveling alone to the medical facility. He shall be escorted by the Supervisor or his designee.

5.3.3 Emergency Drenching Procedures

5.3.3.1 If there is a possibility that a worker has the potential to be exposed to injurious corrosive materials, suitable facilities for quick drenching or flushing of the eyes and body shall be provided within the work area for immediate emergency use.

5.3.3.2 The Supervisor or designee shall train all assigned workers on the correct activation of the drenching unit.

5.3.3.3 The Supervisor or designee shall inspect quick drenching facilities on a weekly schedule to ensure it is operational.

6. Forms

None

7. Regulatory / Permit Requirements

29 CFR 1926.50

8. Record Keeping

Employee training records are maintained per Employee Files, SOP and Records Retention Form, QUA-05.

Title	Date	Reference	Area
Accident-Incident Reporting & Investigation	**1/23/2015**	**1.18**	**Safety**

1. Summary

To minimize workplace injuries, vehicular accidents, equipment damage, chemical releases, claims and any potential liability situations, incidents will be reported and investigations will be conducted. The investigations will provide insight as to the causal factors and identify controls to be initiated to reduce the potential for reoccurrence.

2. Scope

All applicable Brandenburg personnel and work sites will be outlined within this procedure as required

3. Definitions

3.1 Accident / Incident - Any unplanned event resulting in injury or illness, property damage, vehicle damage, loss of assets, fire or explosion, spill, or release

3.2 Investigation - The process of determining how and why an accident / incident occurred in an effort to prevent reoccurrence.

3.3 Near Miss – Any unplanned event which could have resulted in personal injury or illness, property damage, vehicle damage, loss of assets, fire or explosion, spill, or release

3.4 Non-Work Related – Any event or condition reported during work, but having an origin believed not related to Brandenburg work activity.

3.5 Release - Any unplanned escape of vapor, aerosol or gas from its primary container.

3.6 Spill - Any unplanned release of material, gas, solid or liquid, from its primary container, vessel, or tank onto land or into a waterway.

3.7 Claim – Any incident or occurrence that has a liability potential attached to it

4. Responsibility

Responsibility of personnel will be outlined within this procedure as required

5. Methods

5.1 Accident / Incident Claim Reporting

The following Claim reports are to be completed and submitted as soon as practicable by the Supervisor per SOP Safety Form Use. All Claim Reports are subsequently entered into the company database.

5.1.1 Employee Injury / Illness Claim – documents a work-related injury or illness sustained by a Brandenburg employee

5.1.2 Non-Work Related Injury / Illness Claim – documents injury or illness of a Brandenburg employee which is not work-related

5.1.3 Motor Vehicle Accident Claim – documents an accident involving a licensed motor vehicle owned, leased, rented or operated by Brandenburg

5.1.4 Equipment Damage Claim – documents damage to any equipment owned or leased by Brandenburg

5.1.5 Property Damage Claim – documents property damage which occurred at or near a Brandenburg project

5.1.6 Third Party Injury Claim – documents any injury to a non-employee which occurred at or near a Brandenburg project.

5.1.7 Near Miss Claim – documents any event which could have resulted in any other claim type

After entry into the database, electronic Claim Reports are automatically distributed to all management personnel for review.

5.2 Investigations - General

5.2.1 All incidents (examples listed in section 5.1 above) require an investigation. Although the size, type, and number of participants in an investigation may vary, the purpose of an investigation is to determine what happened and how to prevent a recurrence. The scope of the investigation will vary, and will not necessarily depend on the severity of an incident.

5.2.2 Investigations will not commence until the Supervisor has deemed the site safe (structural integrity, properly working machinery, etc…)

5.2.3 Process Review Forms are utilized to document Employee Injury or Illness, Near Miss and Equipment Damage investigations.

5.2.4 Incident Investigation Report may be utilized for Accident / Incident Claim Reporting. Upon completion of an investigation, the report is maintained with the associated Claim.

5.3 Investigation - Tools

5.3.1 Investigation participants will determine and obtain the investigative tools (cameras, measuring devices, PPE, etc…) deemed necessary prior to beginning the investigation.

5.4 Investigation - Evidence

Incident investigations may include gathering (and subsequently securing) one or more of the following types of evidence:

5.4.1 Photographs

5.4.2 Interviews

5.4.3 Written Statements

5.4.4 Physical Evidence

5.4.4.1 Equipment

5.4.4.2 Documentation

5.4.4.3 Audio / Visual recordings

5.4.4.4 Other

5.5 Root Cause Analysis

5.5.1 The root cause of the incident will be determined. The investigative group will determine and document what caused the incident and the reasons it occurred existed (who, what, where, when, why, how).

5.5.2 Indirect causes, underlying factors and other factors which may have contributed to the incident will be documented.

5.6 Corrective Action

5.6.1 The results of all investigations will be applied to correct “systems” which were ultimately determined to have contributed to the incident.

5.6.2 Assignments for ensuring corrective actions, both identification and implementation, will be made to the appropriate person(s). Completion dates for corrective actions will be included.

5.7 Final Assessment

5.7.1 Final assessments will be made to ensure that corrective actions have been effective. Should corrective actions NOT prove to be effective, they will be revised until an effective remedy has been proven.

6. Forms

6.1 SAF-01 Incident Investigation Form

6.2 Employee Injury / Illness Claim

6.3 Near Miss Claim

6.4 Third Party Injury Claim

6.5 Property Damage Claim

6.6 Non-Work Related Injury / Illness Claim

6.7 Motor Vehicle Accident Claim

6.8 Equipment Damage Claim

6.9 Process Review Forms

7. Regulatory / Permit Requirements

Incidents will be reported in accordance with all applicable laws and regulations.

8. Recordkeeping

All Claim Reports and Process Review Forms are maintained as per Employee Files, SOP and Records Retention Form, QUA-05.

Title	Date	Reference	Area
Respiratory Protection	**7/23/2012**	**2.01**	**Safety**

1. Summary

When effective engineering controls are not feasible, or while they are being instituted, appropriate respirators shall be used pursuant to this procedure. A respirator shall be provided to each employee when such equipment is necessary to protect the health of such employee.

2. Scope

All applicable Brandenburg personnel and work sites will be outlined within this procedure as required

3. Definitions

3.1 IDLH – *Immediately Dangerous to Life and Health* – An atmosphere that poses an immediate threat to life, would cause irreversible adverse health effects, or would impair an individual's ability to escape from a dangerous atmosphere.

3.2 NIOSH - *National Institute for Occupational Safety and Health*

3.3 QLFT – *Qualitative Fit Test* – A pass / fail fit test used to assess the adequacy of respirator fit that relies on the individual's response to the test agent. This may include the use of iso-amyl acetate, bitrex, saccharin solution, or irritant smoke.

3.4 QNFT – *Quantitative Fit Test* – An assessment of the adequacy of respirator fit by numerically measuring the amount of leakage into the respirator.

3.5 SCBA -- *Self Contained Breathing Apparatus* – Atmosphere-supplying respirator for which the source of breathing air is not designed to be carried by the user.

3.6 Air-Purifying Respirator – A respirator with an air purifying filter, cartridge, or canister that removes specific air contaminants by passing ambient air through the air-purifying element.

3.7 PAPR - *Powered Air-Purifying Respirator* – An air purifying respirator that uses a blower to force the ambient air through air-purifying elements to the inlet covering.

3.8 Negative Pressure Respirator – A respirator in which the air pressure inside the facepiece is negative during inhalation with respect to the ambient air pressure outside the respirator.

3.9 Positive Pressure Respirator – A respirator in which the pressure inside the respirator facepiece exceeds the ambient air pressure outside the respirator.

3.10 Fit Factor – A quantitative estimate of the fit of a particular respirator to a specific individual, and typically estimates the ratio of the concentration of a substance in ambient air to its concentration inside the respirator when worn.

4. Responsibility

Responsibility of personnel will be outlined within this procedure as required

5. Methods

5.1 Respiratory Protection Program-General

5.1.1 Program Administrator

The program administrator(s) will be responsible for development and implementation of Brandenburg's Respiratory Protection Program. The designated Program Administrators are Brandenburg Environmental Health & Safety (EHS) Managers. The Program Administrator(s) will oversee the Respiratory Protection Program and conduct the required evaluations of program effectiveness. The program shall be updated as necessary to reflect those changes in the workplace conditions that affect respirator use.

5.1.2 Atmosphere Evaluation Respirator Selection

Formal hazard assessments can be located in the Engineering Survey, the site-specific Health and Safety Plans (HASP) or Task Safety Analyses (TSA). Depending on the project or task, work activities will be monitored for respiratory hazards. Considerations include the potential toxicity of the contaminant(s), the routes of entry of the hazardous material, and any physiological effects. A respirator will be provided that is adequate to protect the health of the employee and ensure compliance with other OSHA regulatory requirements. Additional exposure guidelines can be referenced in the American Conference of Governmental Industrial Hygienists (ACGIH) booklet of the Threshold Limit Values (TLV's), and NIOSH Chemical Guides.

The selection of respirators will be based on the physical, chemical, and physiological properties of the air contaminant(s) and on a reasonable estimate of employee exposures. The quality of the fit and the nature of the work being done also affect the choice of respirators.

Brandenburg will evaluate respiratory hazards in the workplace, identify relevant workplace and user factors, and base respirator selection on these factors. Each EHS Manager will determine the type of respirator to be used. In all cases, the respirator chosen will be a NIOSH certified respirator. The respirator shall be used in compliance with the conditions of its certification. If the exposure cannot be identified or reasonably estimated, the atmosphere will be considered IDLH.

5.1.2.1 Respirators for IDLH atmospheres include the following:

5.1.2.1.1 A full facepiece pressure demand SCBA certified by NIOSH for a minimum service life of thirty minutes, or

5.1.2.1.2 A combination full facepiece, pressure demand, supplied-air respirator with auxiliary self-contained air supply.

5.1.2.2 Respirator selection for non-IDLH atmospheres shall be performed as follows:

The respirator selected shall be appropriate for the chemical state and physical form of the contaminant. For protection against gases and vapors, the employee will be provided with an air purifying respirator that is equipped with an end of service life indicator (ESLI) or a change schedule for canisters and cartridges that

will ensure that canisters and cartridges are changed before the end of their service life.

For protection against particulates, the employee will wear an atmosphere-supplying respirator; or an air purifying respirator equipped with a filter certified by NIOSH as a a high efficiency particulate air (HEPA) filter (eg., P100 filter).

5.1.3 Medical Surveillance Program

The Brandenburg designated Physician or Licensed Health Care Provider (PLHCP) will administer the medical evaluation questionnaire and determine the employee's ability to use a respirator.

All employees who are part of the Respiratory Protection Program will undergo a medical evaluation to determine the employee's ability to use a respirator. This medical evaluation will be performed before the employee is fit tested or required to use the respirator in the workplace. Medical evaluations will be performed in strict accordance with the Brandenburg Medical Surveillance Policy (1.12).

5.1.4 Fit Testing

Employees in the Respiratory Protection Program must successfully complete a fit test prior to being allowed to use a respirator in the workplace. The fit test will be performed with the same make, model, style, and size of respirator that he/she will use. The fit test may be a qualitative fit test (QLFT) or quantitative fit test (QNFT). A QLFT will be performed if a fit factor of 100 or less is required. If a fit factor of greater than 100 is required, a QNFT will be performed.

5.1.4.1 The employee will be fit tested prior to initial respirator use, whenever a different respirator facepiece is used, and at least annually thereafter.

5.1.4.2 Additional fit tests will be performed whenever the employee reports or Brandenburg management makes visual observations of changes in the employee's physical condition that could affect respirator fit. Such conditions include, but are not limited to: facial scarring, dental changes, cosmetic surgery, or an obvious change in body weight.

5.1.4.3 If, after passing a fit test, the employee subsequently notifies Brandenburg that the fit of the respirator is unacceptable, the employee will be allowed to select a different respirator facepiece and be retested.

5.1.4.4 Fit testing of tight fitting atmosphere-supplying respirators and tight-fitting powered air purifying respirators shall be accomplished by performing quantitative or qualitative fit testing in the negative pressure mode, regardless of the mode of operation that is used for respiratory protection.

5.1.5 Use of Respirators

5.1.5.1 The employee is required to perform a user seal check each time he/she puts on the respirator as detailed in the fit test section of this document.

5.1.5.2 Employees will not be allowed to wear respirators when the following conditions exist:

5.1.5.2.1 Facial hair that comes between the sealing surface of the facepiece and the face or that interferes with valve function;

5.1.5.2.2 Any condition that interferes with the face to facepiece seal or valve function; or

5.1.5.2.3 If an employee wears corrective glasses or goggles or other personal protective equipment, this equipment shall be worn so that it does not interfere with the seal of the facepiece to the face of the user.

5.1.6 Employees must leave the respirator use area when the following conditions occur:

5.1.6.1 To wash their faces and respirator face pieces as necessary to prevent eye or skin irritation associated with respirator use,

5.1.6.2 If employees detect vapor or gas breakthrough, changes in breathing resistance, or leakage of the face piece, the respirator will be replaced or repaired before the employee will be allowed to return to the work area,

5.1.6.3 To replace the respirator or the filter, cartridge, or canister elements

5.2 IDLH Atmospheres

Brandenburg will use all reasonable engineering controls (i.e. ventilation) to ensure that employees do not have to work in IDLH atmospheres. However, should the situation arise where the atmosphere cannot be changed from IDLH, the following conditions will be met:

5.2.1 At least one person or worker will be located outside of the IDLH Atmosphere.

5.2.2 Visual, voice or signal line communication will be maintained between the employees in the IDLH atmosphere and the person(s) outside the IDLH atmosphere.

5.2.3 The person(s) located outside the IDLH atmosphere will be trained and equipped to provide effective emergency rescue.

5.2.4 The employer or designee is notified before the person(s) located outside the IDLH atmosphere enter the IDLH atmosphere to provide emergency rescue.

5.2.5 The designated employee, once notified, will provide necessary assistance to the situation.

5.2.6 Person(s) located outside of the IDLH atmosphere will be equipped with and qualified to use: positive pressure SCBAs or supplied air respirator with auxiliary SCBA and appropriate retrieval equipment for removing the employee(s) who enter hazardous atmospheres or other equivalent means for rescue where retrieval equipment is not required.

5.3 Maintenance and Care

5.3.1 Cleaning. Each employee is required to clean and disinfect his respirator using procedures recommended by the respirator manufacturer or an equally effective method. Each employee will be trained to properly care for his respirator during training. Respirators will be cleaned as often as necessary to be maintained in a sanitary condition.

Daily cleaning will involve the use of manufacturer recommended wipes.

Additional cleaning, per manufacturer's recommendations, requires the employee to:

5.3.1.1 Remove filters, cartridges, or canisters. Disassemble facepieces by removing speaking diaphragms, demand and pressure–demand valve assemblies, hoses, or any components recommended by the manufacturer. Discard or repair any defective parts.

5.3.1.2 Wash components in warm water with a mild detergent or with a cleaner recommended by the manufacturer. A stiff bristle (not wire) brush may be used to facilitate the removal of dirt.

5.3.1.3 Rinse components thoroughly in clean, warm, preferably running water. Drain excess water.

5.3.1.4 When the cleaner used does not contain a disinfecting agent, respirator components should be immersed for two minutes in one of the following:

1. Hypochlorite solution (50 ppm of chlorine) made by adding approximately one milliliter of laundry bleach to one liter of water at 43 deg. C or,
2. Aqueous solution of iodine (50 ppm iodine) made by adding approximately 0.8 milliliters of tincture of iodine (6-8 grams ammonium and or potassium iodide/199cc of 45% alcohol) to one liter of water at 43 deg. C or,
3. Other commercially available cleansers of equivalent disinfectant quality when used as directed, if their use is recommended or approved by the respirator manufacturer.

5.3.1.5 Rinse components thoroughly in clean, warm, preferably running water. Drain excess water.

5.3.1.6 Components should be hand-dried with a clean lint free cloth or air dried.

5.3.1.7 Reassemble facepiece, replacing filters, cartridges, and canister where necessary.

5.3.1.8 Test the respirator to ensure that all components work properly.

5.3.2 Storage. Respirators will be stored to protect them from damage, contamination, dust, sunlight, extreme temperatures, excessive moisture and damaging chemicals, and will be packed or stored to prevent deformation of the face piece and exhalation valve. They will also be stored in accordance with manufacturer's recommendations. When required, emergency respirators will be kept accessible to the work area.

5.3.3 Inspection. Employees will inspect respirators before each use and during cleaning. The inspections will include: a check of respirator function, tightness of connections, and the condition of various parts including but not limited to, the face piece, head straps, valves, connecting tube, cartridges, canisters filters and a check of elastomeric parts for pliability and signs of deterioration. Respirator inspection shall include:

5.3.3.1 Cleanliness of facepiece and internal parts such as valves, nosecups, etc.

5.3.3.2 Rips, tears, stiffening or other signs of aging to all o-rings, gaskets, diaphragm valves, or the face piece itself.

5.3.3.3 Breaks, cuts, frays, tears or loss of elasticity of the head straps or hair net.

5.3.3.4 Missing hardware.

5.3.3.5 Scratched, nicked, or scraped face piece lens. If so, determine if they impair vision.

5.3.3.6 All respirators maintained for use in emergency situations shall be inspected at least monthly and in accordance with the manufacturers' recommendations, and shall be checked for proper function before and after use.

5.4 Repairs

Should any respirator fail an inspection or otherwise found to be defective, it will be removed from service, and either discarded, repaired or adjusted as follows:

5.4.1 Repairs or adjustments to respirators are to be made only by persons appropriately trained to perform such operations and shall use only the respirator manufacturer's NIOSH approved parts designed for the respirator;

5.4.2 Respirator repairs will be made in accordance with the manufacturer's recommendations and specifications for the type and extent of repairs to be performed; and

5.4.3 Reducing and admission valves, regulators, and alarms shall be adjusted or repaired only by the manufacturer or a technician trained by the manufacturer.

5.5 Training

All employees who are expected to use respirators will be trained prior to performing work with a respirator. The training will be documented on the Respirator Fit Form (SAF-07A or SAF-07B) and will cover the following subjects:

5.5.1 Why the respirator is necessary and how improper fit, usage, or maintenance can compromise the protective effect of the respirator;

5.5.2 Limitation and capabilities of the respirator;

5.5.3 Effective use in emergency situations, including situations in which the respirator malfunctions;

5.5.4 Inspection, putting the respirator on, taking the respirator off and checking of the seals;

5.5.5 Maintenance and storage procedures;

5.5.6 How to recognize medical signs and symptoms that may limit or prevent the effective use of respirators; and

5.5.7 Change-out procedures for cartridges or filters

5.6 Retraining will be administered annually, and when the following situations occur:

5.6.1 Changes in the workplace or the type of respirator which render previous training obsolete.

5.6.2 Inadequacies in the employee's knowledge or use of the respirator indicate that the employee has not retained the requisite understanding or skill; or

5.6.3 Any other situation arises in which retraining appears necessary to ensure safe respirator use.

5.7 Fit Test Procedures

5.7.1 The employee will be provided with a 3M respirator. If the 3M respirator is determined to provide insufficient protection or comfort, the employee will be allowed to choose from other various makes and models so that the respirator is acceptable to, and correctly fits, the user.

5.7.2 Prior to the selection process, the employee will be shown how to put on a respirator, how it should be positioned on the face, how to set strap tension and how to determine an acceptable fit. A mirror will be available to assist the subject in evaluating the fit and position of the respirator. Note: Brandenburg considers the training information exchanged during fit testing a review, and does not consider this formal training.

5.7.3 The employee will be informed that he/she is being asked to select the respirator that provides the most acceptable fit. Each respirator represents a different size and shape, and if fitted and used properly, will provide adequate protection.

5.7.4 The employee will be instructed to hold each chosen facepiece up to the face and eliminate those that obviously do not give an acceptable fit.

5.7.5 The most comfortable mask is donned and worn at least five minutes to assess comfort. If the employee is not familiar with using a particular respirator, the test subject shall be directed to don the mask several times and to adjust the straps each time to become adept at setting proper tension on the straps.

5.7.6 Assessment of comfort shall include a review of the following points with the test subject and allowing the test subject adequate time to determine the comfort of the respirator:

5.7.6.1 Position the mask on the nose,

5.7.6.2 Room for eye protection,

5.7.6.3 Room to talk,

5.7.6.4 Position of mask on face and cheeks,

5.7.7 The following criteria will be used to help determine the adequacy of the respirator fit:

5.7.7.1 Chin properly placed;

5.7.7.2 Adequate strap tension, not overly tightened;

5.7.7.3 Fit across nose bridge;

5.7.7.4 Respirator of proper size to span distance from nose to chin;

5.7.7.5 Tendency of respirator to slip;

5.7.7.6 Self-observation in mirror to evaluate fit and respirator position.

5.7.8 Employees shall conduct conventional negative and positive pressure fit checks. Before conducting the negative and positive checks, the employee will “seat” his/her mask by moving the head side to side and up and down, and taking a few deep breaths.

5.7.8.1 Negative pressure test

To perform this test, close off the inlet of the cartridges by covering them with the palms of the hands or by blocking the breathing tube with the palm so that air does not pass through. Inhale gently so that the facepiece collapses slightly onto the face and hold for 10 seconds. If the face piece remains slightly collapsed and no inward leakage is detected, the respirator is potentially tight enough. This test can be used only on respirators with tight fitting facepieces. After completing the negative pressure test, the positive pressure test shall be performed.

5.7.8.2 Positive pressure test

The check is similar to the negative pressure check except the palm of the hand should be placed over the exhalation valve and the employee should exhale gently into the facepiece. The fit is considered satisfactory if slight positive pressure can be built up inside the face piece without any evidence of outward leakage. The test is easy for respirators whose valve cover has a single small port that can be closed by the palm.

5.7.9 Brandenburg will not conduct a fit test if any of the following conditions exist:

5.7.9.1 Hair growth exists between the skin and the face piece sealing surface, such as stubble beard growth, beard, mustache or sideburns which cross the respirator sealing surface.

5.7.9.2 If apparel appears to be interfering with a satisfactory fit.

5.7.9.3 If the employee exhibits difficulty in breathing during the tests, he shall be referred to our physician to determine whether the test subject can wear a respirator while performing his duties.

5.7.10 If the employee finds the fit of the respirator unacceptable, the employee will be given the opportunity to select a different respirator and be retested.

5.7.11 Prior to the fit test, the employee will be given a description of the fit test and the employee's responsibilities during the test procedure. The respirator will be worn at least 5 minutes before the start of the fit test.

5.7.12 The fit test shall be performed while the employee is wearing any applicable safety equipment that may be worn during actual respirator use which could interfere with respirator fit.

5.7.13 Test Exercises

The following test exercises will be used during all fit testing methods, except for CNP quantitative fit testing protocol.

Normal breathing: In a normal standing position without talking, the subject shall breath normally.

Deep breathing: In a normal standing position, the subject shall breathe slowly and deeply, taking caution so as not to hyperventilate.

Turning head side-to-side: Standing in place, the subject shall slowly turn his/her head from side to side between the extreme position on each side. The head shall be held at each extreme momentarily so the subject can inhale at each side.

Moving head up and down: Standing in place, the subject shall slowly move his/her head up and down. The subject shall be instructed to inhale in the up position (when looking toward the ceiling).

Talking: The subject shall talk out loud slowly and loud enough so as to be heard clearly by the test conductor. The subject can read from a prepared text such as the Rainbow Passage (see below), count backward from 100, or recite a memorized poem or song.

<u>Rainbow Passage</u>

When sunlight strikes raindrops in the air, they act like a prism and form a rainbow. The rainbow is a division of white light into many beautiful colors. These take the shape of long, round arch with its path high above, and its two ends apparently beyond the horizon. There is, according to legend, a boiling pot of gold at one end. People look, but no one ever finds it. When a man looks for something beyond his reach, his friends say he is looking for the pot of gold at the end of the rainbow.

Grimace: The test subject shall grimace by smiling or frowning.

Bending over: The test subject shall bend at the waist as if he/she were to touch his/her toes. Jogging in place shall be substituted for this exercise in those test environments such as shroud-type QNFT units that prohibit bending at the waist.

And finally, normal breathing again: - same as above.

Each test exercise shall be performed for one minute except for the grimace exercise which shall be performed for 15 seconds

5.7.14 Qualitative Fit Test (QLFT) Protocols

Qualitative fit testing shall be accomplished by using one of the following methods listed in 1910.134 Appendix A. These include the isoamyl acetate protocol, saccharin solution aerosol protocol, Bitrex™ solution aerosol test protocol, and irritant smoke (stannic chloride) protocol. Brandenburg shall ensure that persons administering the QLFT are able to prepare test solutions, calibrate equipment, perform tests properly, recognize invalid tests, and ensure that test equipment is in proper working order. Equipment shall be kept clean and well maintained so as to operate within the parameters for which it was designed. The individual test methods require the use of air purifying respirators equipped with the appropriate cartridge.

5.7.15 Quantitative Fit Test (QNFT) Procedures

Quantitative fit testing shall be accomplished by using one of the methods listed in 1910.134 Appendix A. QNFT uses ambient aerosols as the test agent and appropriate instrumentations to quantify the respirator fit. A minimum fit factor pass level of at least 100 is necessary for a half-mask respirator and a minimum fit factor pass level of at least 500 is required for a full facepiece negative pressure respirator. The entire screening and testing procedure shall be explained to the test subject prior to the conduct of the screening test.

Brandenburg shall ensure the persons administering the QNFT are able to calibrate equipment and perform tests properly, recognize invalid tests, calculate fit factors properly and ensure that test equipment is in proper working order. The operator shall also ensure the equipment is kept clean, and is maintained and calibrated according to the manufacturer's instructions so as to operate at the parameters for which it was designed.

5.8 Breathing Air - Quality and Use

Compressed breathing air used for respiration will have the following specifications:

5.8.1 Compressed breathing air will meet at least the requirement for Type 1 Grade D breathing air described in ANSI Compressed Gas Association Commodity Specification for Air, G-7.1-1989, to include:

5.8.1.1 Oxygen content of 19.5-23.5%;

5.8.1.2 Hydrocarbon (condensed) content of 5 milligrams per cubic meter of air or less;

5.8.1.3 Carbon monoxide (CO) content of 10 ppm or less;

5.8.1.4 Carbon dioxide (CO_2) of 1,000 ppm or less; and

5.8.1.5 Lack of noticeable odor

5.8.2 Cylinders

Cylinders used to supply breathing air to respirators will meet the following requirements:

5.8.2.1 Cylinders will be tested and maintained as prescribed in the Shipping Container Specification Regulations of the Department of Transportation (49 CFR part 173 and part 178);

5.8.2.2 Cylinders of purchased breathing air will have a certificate of analysis from the supplier that the breathing air meets the requirements for Type 1 – Grade D breathing air; and

5.8.2.3 The moisture content in the cylinder will not exceed a dew point of 50 deg. F. at 1 atmospheric pressure.

5.8.3 Compressors

Compressors used to supply breathing air to respirators are constructed and situated so as to:

5.8.3.1 Prevent entry of contaminated air into the air-supply system. Minimize moisture content so that the dew point at 1 atmosphere pressure is 10 degrees F below the ambient temperature;

5.8.3.2 Have suitable in-line air purifying sorbent beds and filters to further ensure breathing air quality. Sorbent beds and filters shall be maintained and replaced or refurbished periodically following the manufacturer's instructions.

5.8.3.3 Have a tag containing the most recent change date and the signature of the person authorized by the employer to perform the change. This tag will be placed at the compressor.

5.8.3.4 For compressors that are not oil lubricated, the employer shall ensure that carbon monoxide levels in the breathing air do not exceed 10 ppm.

5.8.3.5 For any oil lubricated compressors, a high-temperature or carbon monoxide alarm or both, will be utilized to ensure breathing air from exceeding 10 ppm.

5.8.3.6 All couplings on breathing air equipment will be incompatible with couplings used for non-breathing air equipment.

5.9 Continuing Respirator Effectiveness:

As part of the Brandenburg safety program, work area conditions and the degree of employee exposure or stress that may affect respirator effectiveness shall be monitored on a regular basis when there is a change in work area conditions or degree of employee exposure or stress. The Program Administrator is responsible to re-evaluate the continued effectiveness of the respirator when there is a change in work area conditions or degree of employee exposure or stress.

5.10 Program Evaluation

Brandenburg Program Administrators will conduct evaluations of the workplace to ensure that the written Respiratory Protection Program is being properly implemented, and to consult employees to ensure that they are using the respirators properly.

5.10.1 Employees will be consulted to assess their view on program effectiveness and to identify any problems. Any problems that are identified during this assessment will be promptly addressed and corrected. Factors to be assessed include:

5.10.1.1 Respirator fit,

5.10.1.2 Appropriate respirator selection for the hazards to which the employee is exposed,

5.10.1.3 Proper respirator use under the workplace conditions, and

5.10.1.4 Proper respirator maintenance

6. Forms

6.1 Respirator Fit Test Certification.Qualitative Form (SAF-07A)

6.2 Respirator Fit Test Certification.Quantitative Form (SAF-07B)

7. Regulatory / Permit Requirements

29 CFR 1910.134

8. Record Keeping

Employee medical and training files are maintained per Employee Files, SOP and Records Retention Form, QUA-05.

Title	Date	Reference	Area
Personal Protective Equipment	**7/23/2012**	**2.02**	**Safety**

1. Summary

The use of personal protective equipment (PPE), including protective clothing, is an integral part of worker protection. All project work requires the use of some type of PPE. For each project site, the PPE requirements are listed in the site-specific Health and Safety Plan (HASP).

2. Scope

All applicable Brandenburg personnel and work sites will be outlined within this procedure as required

3. Definitions

None

4. Responsibility

Responsibility of personnel will be outlined within this procedure as required

5. Methods

5.1 Determination of PPE Requirements

A PPE hazard assessment will take place prior to the inception of site work activity. This hazard assessment may be documented in the Engineering Survey, safety survey, site-specific HASP, or in the form of Task Safety Analysis (TSA). This may include, but not be limited to, PPE for eyes, face, head and extremities, protective clothing, respiratory devices, and protective shields and barriers. The types of hazards considered in the assessment will include processes or environment, chemical hazards, radiological hazards, or mechanical irritants encountered in a manner capable of causing injury or impairment in the function of any part of the body through absorption, inhalation or physical contact.

5.2 Payment for PPE

PPE shall be provided by Brandenburg at no cost to employees as outlined in 29 CFR 1910.132(h). Specific PPE Brandenburg would or would not be responsible for providing to employees is covered in the OSHA Employer Payment for Personal Protective Equipment; Final Rule 72:64341-64430. Brandenburg's SOP Metatarsal Safety Work Boots and SOP Prescription Safety Glasses will be followed.

5.3 Minimum PPE Requirements – General

Protective eye and face protection, and head protection will meet ANSI consensus standards. Protective footwear will meet either the ANSI and/or ASTM consensus standards. The following PPE are minimum requirements for any work site:

5.3.1 Hard hat,

5.3.2 Safety glasses with permanently affixed side shields,

5.3.3 Safety-toe (steel toe / composite) protective footwear supporting the ankle,

5.3.4 Sleeved shirts (must have a minimum 4-inch sleeve) and long pants, and

5.3.5 ANSI approved Class II reflective high visibility vests or shirt when working in close proximity to vehicular traffic and while working around heavy equipment. Employees working in aerial lifts, on scaffolds, or similar elevated working surfaces where a greater hazard is created are not required to wear such vests.

5.4 Other PPE Requirements

Additional PPE requirements may include the following depending on activities being performed and hazards present:

5.4.1 Hearing Protection

5.4.2 Leather-type work gloves (unless rotating equipment creates a greater hazard)

5.4.3 Face shields and/or goggles to protect from flying objects (when grinding)

5.4.4 Foam lined safety glasses (for use in dusty environments)

5.4.5 Long sleeved shirts may be required for specific projects and / or tasks. Each site requirement shall be detailed in the Project Specific Health & Safety Plan (HASP).

5.4.6 Disposable coveralls

5.4.7 Chemical protective gloves and/or suits (chemical and/or hazardous waste handling, skin contact likely)

5.4.8 Arc flash protective clothing compliant with NFPA 70E

5.4.9 When work is done over or near water, where the danger of drowning exists, an approved U.S. Coast Guard personal flotation device shall be worn

5.4.10 Personal fall arrest systems

5.4.11 Respiratory protection (including air-purifying, supplied-air, powered-air purifying, and/or self-contained breathing apparatus)

5.4.12 Metatarsal protection as per Task Safety Analyses (TSA) and site-specific Health & Safety Plans (HASP)

5.5 Brandenburg's projects will routinely require the use of cutting torches and/or welding equipment. Personnel who perform work with a cutting torch will have further PPE requirements including, but not limited to:

5.5.1 Face shield – tinted as necessary (safety glasses will be worn at all times even under face shields)

5.5.2 Hearing protection

5.5.3 Respiratory protection (minimum half-face with P100 filters when torch cutting)

5.5.4 100% cotton or natural fiber clothing

5.5.5 Long sleeves

5.5.6 Flame Retardant Coveralls

5.5.7 Welding/burning gloves – gauntlet style

Additional PPE that may be used for employees using cutting torches and/or welding equipment include:

5.5.8 Welding helmet (welding)

5.5.9 Cotton shroud

5.5.10 Kevlar or rawhide sleeves

5.5.11 Leggings

Filter lenses used for protection against radiant energy will vary in accordance with use and conditions. Table E-2 of 29 CFR 1926.102 shall be used as a guide for the selection of the proper shade numbers of filter lenses or plates used in welding and cutting. Shades more dense than those listed may be used to suit the individual's needs.

5.6 HAZWOPER Work

PPE shall be selected and used which will protect employees from the hazards and potential hazards they are likely to encounter as identified during the site characterization and analysis. PPE selection shall be based on an evaluation of the performance characteristics of the PPE relative to the requirements and limitations of the site, the task-specific conditions and duration, and the hazards and potential hazards identified at the site. These requirements are stated as levels of protection. These levels range from level D which is least protective, to level A which is the most protective. Descriptions of levels of protection below:

5.6.1 Level A - To be selected when the greatest level of skin, respiratory, and eye protection is required:

Positive pressure, full face-piece self-contained breathing apparatus (SCBA), or positive pressure supplied air respirator with escape SCBA, approved by the National Institute for Occupational Safety and Health (NIOSH).

Fully encapsulating chemical resistant suit

Inner and outer chemical resistant gloves

Chemical resistant boots with steel toe and shank

Hard hat

5.6.2 Level B - The highest level of respiratory protection is necessary but a lesser level of skin protection is needed:

Positive pressure, full-facepiece self-contained breathing apparatus (SCBA), or positive pressure supplied air respirator with escape SCBA (NIOSH approved)

Hooded chemical-resistant clothing (overalls and long-sleeved jacket; coveralls; one or two-piece chemical-splash suit; disposable chemical-resistant overalls)

Inner and outer chemical resistant gloves

Chemical resistant boots with steel toe and shank

Boot-covers, outer, chemical-resistant (disposable) - (optional)

Hard hat

5.6.3 Level C - The concentration(s) and type(s) of airborne substance(s) is known and the criteria for using air purifying respirators are met:

Full-face or half-mask, air purifying respirators (NIOSH approved).

Hooded chemical-resistant clothing (overalls; two-piece chemical-splash suit; disposable chemical-resistant overalls)

Inner and outer chemical resistant gloves

Chemical resistant boots with steel toe and shank

Boot-covers, outer, chemical-resistant (disposable) - (optional)

Hard hat

5.6.4 Level D - A work uniform affording minimal protection; used for nuisance contamination only:

Coveralls or work uniform.

Metatarsal boots with steel toe and shank

Boot-covers, outer, chemical-resistant (disposable)

Hard hat

Safety glasses or chemical splash goggles

5.6.5 Options

5 minute escape packs

Faceshield

Hearing protection

Fall protection

Splash goggles

Personal gas detectors

Other protection as specified in the HASP

5.7 Training

Training shall be provided to each employee who is required to use PPE. Each such employee shall be trained to know at least the following:

When PPE is necessary;

What PPE is necessary;

How to properly don, doff, adjust, and wear PPE;

The limitations of the PPE; and,

The proper care, maintenance, useful life and disposal of the PPE.

Each affected employee shall demonstrate an understanding of the training, and the ability to use PPE properly, before being allowed to perform work requiring the use of PPE.

When Brandenburg has reason to believe that any affected employee who has already been trained does not have the understanding and skill required as outlined above, Brandenburg shall retrain each such employee.

5.8 PPE Inspection

Workers are required to inspect their PPE prior, during and after use. Any deficiency will be addressed immediately. Details regarding respiratory equipment inspections are located in the Respiratory Protection Policy (2.01).

5.9 Storage

PPE will be stored in accordance with manufacturer's recommendations.

6. Forms

None

7. Regulatory / Permit Requirements

29 CFR 1910.132

29 CFR 1926.95

8. Recordkeeping

None

Title	Date	Reference	Area
Confined Space	**7/23/2012**	**3.01**	**Safety**

1. Summary

This procedure has been developed to establish minimum requirements and procedures for the safety and health of workers who work in, or in connection with, confined space. Confined spaces include, but are not limited to: sumps, tanks, basements, trenches, or vessels, etc… where environmental and physical hazards exist.

2. Scope

All applicable Brandenburg personnel and work sites will be outlined within this procedure as required

3. Definitions

3.1 Attendant - A trained individual stationed outside a confined space who monitors the authorized entrant(s) and who performs all assigned attendant duties.

3.2 Authorized Entrant – A trained individual authorized to enter a permit required confined space.

3.3 Confined Space - A space that is large enough and so configured that an employee can enter and perform assigned work, has limited or restricted access, and is not designed for continuous human occupancy.

3.4 Entry Supervisor – An individual (i.e. Supervisor) who has the responsibility of directing all aspects of the confined space entry. The Entry Supervisor is responsible for determining if acceptable entry conditions are present at a permit space where entry is planned, for authorizing entry, overseeing entry operations, and for terminating entry.

3.5 Non-Permit Confined Space – A confined space that does not contain or, with respect to atmospheric hazards, have the potential to contain any hazard capable of causing death or serious physical harm.

3.6 Permit Required Confined Space - A confined space that has one or more of the following characteristics:

3.6.1 Contains, or has the potential to contain, a hazardous atmosphere;

3.6.2 Contains a material that has the potential for engulfing an entrant;

3.6.3 Has an internal configuration such that an entrant could be trapped or asphyxiated by inwardly converging walls or by a floor which slopes downward and tapers to a smaller cross-section; or

3.6.4 Contains any other recognized serious safety or health hazard.

4. Responsibility

Responsibility of personnel will be outlined within this procedure as required

5. Methods

5.1 Hazard Assessment

5.1.1 A hazard assessment will take place prior to the inception of site work activity involving potential confined space entry work. This hazard assessment may be documented in the Engineering Survey, safety survey, site-specific Health and Safety Plan (HASP), or in the form of Task Safety Analysis (TSA).

5.1.2 Brandenburg will make all reasonable efforts to eliminate the confined space through the adjustment or modification of the vessel or space. Brandenburg will attempt alternative methods to eliminate entry into any confined space.

5.1.3 If the workplace contains permit-required confined spaces, workers will be informed as to the space locations and hazards. If entry is required, Brandenburg's Confined Space Program shall be implemented.

5.1.4 Prevention of Unauthorized Entry and Signs. No persons shall be allowed to enter a confined space unless a work permit for confined space has been authorized, all permit requirements are in place, and reviewed with those entering. Only authorized personnel shall enter a confined space.

Signs shall be placed at the entrance to all confined spaces that are not closed systems or can be readily accessed.

5.2 Training

5.2.1 Workers shall have initial training before work assignment, and refresher training before there is a change in assigned duties; whenever there is a change in permit space that presents a hazard in which an employee has not been previously trained, or there are inadequacies in the employee's knowledge and skill.

5.2.2 Authorized Entrants Training /Responsibilities

Authorized entrants shall be trained for the safe performance of the duties of an entrant. The training shall include:

5.2.2.1 Review of the responsibilities of entrants, attendants, and entry supervisors;

5.2.2.2 Hazards of confined space entry;

5.2.2.3 Signs and symptoms of exposure, and consequences of exposure;

5.2.2.4 Means to stay in contact with attendant;

5.2.2.5 Actions to take when unusual events occur such as exposure effects, fire, leak, etc.; and

5.2.2.6 Proper use of:

5.2.2.6.1 Personal protective equipment;

5.2.2.6.2 Communication equipment;

5.2.2.6.3 Rescue and emergency equipment; and

5.2.2.6.4 Any other equipment necessary for safe entry into (and rescue from) the confined space.

The authorized entrants will exit the space as quickly as possible whenever:

5.2.2.7 An order to evacuate is given by the attendant or the entry supervisor;

5.2.2.8 The authorized entrants identify a hazardous situation; or

5.2.2.9 An evacuation alarm is activated.

5.2.3 Attendant Training / Responsibilities

Attendants shall be trained for the safe performance of the duties of a confined space attendant. The training shall include:

5.2.3.1 Responsibilities of attendants, entrants and Entry Supervisors;

5.2.3.2 Continuous accurate accounting of authorized entrants in the space;

5.2.3.3 Awareness of behavioral effects to entrants of hazardous exposure;

5.2.3.4 The requirement to remain outside the permit space at all times;

5.2.3.5 Communicating with authorized entrants as necessary to monitor entrant status

5.2.3.6 Alerting entrants of the need to evacuate;

5.2.3.7 How to summon rescue services;

5.2.3.8 Keeping unauthorized persons away from the permit space

5.2.3.9 Advising unauthorized entrants to exit immediately

5.2.3.10 Removing and reporting unauthorized entrants to Entry Supervisors.

The attendant may also have the role of a rescue leader, atmosphere tester, and Entry Supervisor.

5.2.4 Entry Supervisors Training / Responsibilities

Entry Supervisors shall be trained for the safe performance of the duties of a confined space Entry Supervisor. The training shall include:

5.2.4.1 Responsibilities of attendants, entrants and Entry Supervisors;

5.2.4.2 Detailed training in the permit system including permit forms;

5.2.4.3 Hazard evaluation, including air sampling;

5.2.4.4 Hazard control procedures;

5.2.4.5 Protective equipment selection procedures;

5.2.4.6 Verification that all tests specified by the permit have been conducted, and that all procedures and equipment specified by the permit are in place;

5.2.4.7 Cancellation of permits and recordkeeping

5.2.4.8 Verification of the availability of rescue services.

5.3 Pre-Entry Protocol

5.3.1 Hazard Evaluation and Control Measures

Prior to entry, all suspected or known hazards concerning the confined space will be evaluated. At a minimum, the following conditions will be assessed:

5.3.1.1 Whether a hazardous atmosphere exists;

5.3.1.2 Whether the space contains a material that has the potential to engulf an entrant;

5.3.1.3 Whether the space has an internal configuration that could trap or asphyxiate an entrant;

5.3.1.4 Whether the space contains energized equipment or noise hazards

Based on the results of the evaluation, control measures will be identified to prevent unauthorized entry. Signs will be posted identifying the existence and location of the confined space. The area will be marked with barricade tape, or other equivalent means.

5.3.2 Air Monitoring

Air monitoring will be conducted prior to entry. Any worker who enters the space will be provided an opportunity to observe the pre-entry testing.

The following conditions must be met prior to entry:

5.3.2.1 Oxygen Level - greater than 19.5 % and less than 23.5 %,

5.3.2.2 Explosive/Flammable Vapors - Less than 10 % of the lower explosive limit (LEL),

5.3.2.3 Toxic Vapor Concentration - Below regulatory limits and / or recommended guidelines. See site-specific HASP.

If the above conditions cannot be met, entry may not proceed. The space will be re-evaluated and special ventilation, respiratory protection, and PPE may be required.

5.3.3 Mechanical Ventilation

Continuous forced air ventilation will be used when the following conditions exist:

5.3.3.1 When ventilation is needed to maintain acceptable entry conditions (i.e. LEL <10%, O2 >19.5%<23.5%)

5.3.3.2 When toxic atmosphere may be produced as part of the work procedure (i.e. welding, cutting)

When mechanical ventilation is being used, the following will apply:

5.3.3.3 A worker may not enter the space until the forced air ventilation has eliminated any hazardous atmosphere.

5.3.3.4 The ventilation will be directed to ventilate the immediate areas where workers are or will be present.

5.3.3.5 Ventilation will continue until all employees have left the space.

5.4 Air Monitoring

5.4.1 Air monitoring may also be used to identify and quantify hazardous atmospheres. Air monitoring may also be used to determine the appropriate level of personal protective equipment. Since the vapor density of substances vary, monitoring will be conducted at various levels within the space to ensure a cross sectional representation of the space.

5.4.2 Air monitoring will be performed on all permit required confined space entry projects.

5.5 Air Monitoring Equipment

5.5.1 Prior to entry, a calibrated direct-reading instrument shall be used to test confined space atmosphere.

5.5.2 An air monitoring equipment calibration check will be completed before each day's use. Required monitoring will be specified in the permit. Continuous monitoring for oxygen concentration and combustible gases will always be required for permit spaces. Monitoring for toxic gases or vapors may be required as specified on the permit.

5.5.3 If air monitoring indicates a hazardous atmosphere:

5.5.3.1 The space will not be entered or, if entered, evacuated immediately,

5.5.3.2 The space will be evaluated to determine how the hazardous atmosphere developed,

5.5.3.3 Protective measures will be taken before subsequent entry takes place.

5.6 Personal Protective Equipment (PPE)

5.6.1 Based on results of the hazard evaluation, appropriate PPE will be selected. Required PPE will be documented in the Confined Space Entry Permit (SAF-22).

5.7 Communication

5.7.1 Communication equipment will be provided as necessary to both the attendant and entrants to enable the attendant to monitor entrant status and to enable the attendant to alert entrants of the need to evacuate the space.

5.8 Confined Space Entry Permit

5.8.1 An entry permit must be completed by the Entry Supervisor PRIOR to performing any entry. Brandenburg may use customer permits, or use permits available through outside sources as long as the essential information is the same.

5.8.2 The permit must include the names of all individuals with their current personnel roles for the entry.

5.8.3 Each Confined Space Entry Permit will be valid for a single work shift, or part thereof. On jobs requiring more than one shift, a new permit will be completed at the start of each shift, including atmosphere testing, when subsequent shift personnel arrive at the job and before the confined space is entered.

5.8.4 The executed permit must be displayed at the job site in an obvious and visible location near the point of entry.

5.8.5 At the end of the work shift, the permit will be removed from the job site by the Entry Supervisor. At this time the permit will be cancelled.

5.8.6 A Confined Space Entry Permit shall be cancelled when:

5.8.6.1 A condition that is not allowed under the entry permit arises in or near the permit space.

5.8.6.2 The entry operations covered by the entry permit have been completed.

5.8.7 Authorization to Enter a Confined Space - Personnel Roles

5.8.7.1 No employee is to enter any confined space without a Confined Space Entry Permit having been signed by the Entry Supervisor.

5.8.7.2 All personnel with a defined role in the entry will sign the Confined Space Entry Permit PRIOR to any entry taking place.

5.9 Host Employer Responsibilities

5.9.1 The Host Employer (e.g. – owner, customer) will make the following information available to Brandenburg prior to commencement of work within a confined space:

5.9.1.1 Hazards associated with the confined space

5.9.1.2 Any information concerning the customer’s experience with the confined space

5.9.1.3 Acknowledge work is to be done in compliance with this procedure

5.9.1.4 Procedures or precautions which the host employer has implemented for protection of employees in or near permit spaces

5.9.1.5 Coordinate entry operations when both the host employer or other employer personnel and Brandenburg personnel will be working in or near permit spaces simultaneously

5.9.1.6 Conduct a debriefing session at the end of the job to discuss any hazards encountered during the entry.

5.9.2 Brandenburg will do the following:

5.9.2.1 Obtain from the host employer information regarding the hazards and entry operations of the space

5.9.2.2 Coordinate entry operations with the host employer when both host employer personnel and Brandenburg personnel will be working in or near permit spaces.

5.9.2.3 Inform the host employer of the requirements of Brandenburg's Confined Space Program

5.9.2.4 Advise the customer of unplanned hazards encountered inside the space

5.10 Rescue and Emergency Services

5.10.1 Brandenburg uses outside sources to provide entry rescue services to permit required confined space entrants.

5.10.2 Brandenburg will evaluate the rescuer's ability to respond to a rescue summons in a timely manner, considering the hazard(s) identified. What is considered "timely" will vary according to the specific hazards involved in each entry. Details of emergency responder evaluations will be included in the site specific HASP.

5.10.3 Selection of a Rescue Team

Brandenburg will select a rescue team or service from those evaluated that:

5.10.3.1 Has the capability to reach the victim(s) within a time frame that is appropriate for the hazard identified;

5.10.3.2 Is equipped for and is proficient in performing the needed rescue services;

5.10.3.3 Has been informed of the hazards that they may encounter when called upon to perform rescue at the site; and

5.10.3.4 Has been provided with access to all permit spaces from which rescue may be necessary so that the rescue service can develop appropriate rescue plans and practice rescue operations

5.10.4 Non-Entry Rescue – Retrieval Systems

Brandenburg may perform non-entry rescue services. To facilitate non-entry rescue, retrieval systems or methods shall be used whenever an authorized entrant enters a permit space,

unless the retrieval equipment would increase the overall risk of entry or would not contribute to the rescue of the entrant.

Retrieval systems will meet the following requirements:

5.10.4.1 The authorized entrants entering a confined space must wear a full body harness, with a retrieval line attached at the center of the entrant's back near shoulder level, or above the entrant's head (for vertical rescue).

5.10.4.2 The other end of the retrieval line shall be attached to a mechanical device or fixed point outside the permit space in such a manner that rescue can begin as soon as the rescuer becomes aware that rescue is necessary. A mechanical device shall be available to retrieve personnel from vertical type permit spaces more than five (5) feet deep.

5.10.4.3 Wristlets may be used in lieu of the chest or full body harness if:

5.10.4.3.1 The use of a chest or full body harness is infeasible or creates a greater hazard; and

5.10.4.3.2 When the use of wristlets is the safest and most effective alternative

5.11 Employee Participation

Brandenburg encourages the participation of all affected employees with the permit required Confined Space Program.

6. Forms

6.1 Confined Space Entry Permit (SAF-22)

7. Regulatory / Permit Requirements

29 CFR 1910.146

8. Recordkeeping

Employee training records will be maintained per Employee Files, SOP and Records Retention Form, QUA-05.Brandenburg shall retain each canceled entry permit for a period of at least 1 year.

Title	Date	Reference	Area
Lock Out – Tag Out	**8/26/2015**	**3.02**	**Safety**

1. Summary

Brandenburg requires that machines and equipment have all energy sources at level zero and be locked or tagged prior to an employee's performance of any servicing or maintenance on a machine or equipment where the unexpected energizing, start-up, or release of stored energy could occur and cause injury.

2. Scope

All applicable Brandenburg personnel and work sites will be outlined within this procedure as required

3. Definitions

3.1 Authorized Employee – An employee who locks out or tags out machines or equipment in order to perform servicing or maintenance on that machine or equipment.

3.2 Affected Employee – An employee whose job requires him/her to operate or use a machine or equipment on which servicing or maintenance is being performed under lock-out or tag-out, or whose job requires him/her to work in an area in which such servicing or maintenance is being performed.

3.3 Energy Source – Any source of electrical, mechanical, hydraulic, pneumatic, chemical, thermal, or other energy.

3.4 Energized - Connected to an energy source or containing residual or stored energy.

3.5 Energy Isolating Device - A mechanical device that physically prevents the transmission or release of energy, including but not limited to the following: a manually operated electrical circuit breaker; a disconnect switch; a manually operated switch by which the conductors of a circuit can be disconnected from all ungrounded supply conductors, and, in addition, no pole can be operated independently; a line valve; a block; and any similar device used to block or isolate energy. Push buttons, selector switches and other control circuit type devices are not energy isolating devices.

3.6 Lock-Out - The placement of a lock-out device on an energy isolating device, in accordance with an established procedure, ensuring that the energy isolating device and the equipment being controlled cannot be operated until the lock-out device is removed.

3.7 Lock-Out Device - A device that utilizes a positive means such as a lock, either key or combination type, to hold an energy isolating device in the safe position and prevent the energizing of a machine or equipment. Included are blank flanges and bolted slip blinds.

3.8 Servicing and/or Maintenance - Workplace activities such as constructing, installing, setting up, adjusting, inspecting, modifying, and maintaining and/or servicing machines or equipment. These activities include lubrication, cleaning or unjamming of machines or equipment and making adjustments or tool changes, where the employee may be exposed to the *unexpected* energization or startup of the equipment or release of hazardous energy.

3.9 Tag-Out - The placement of a tag-out device on an energy isolating device, in accordance with an established procedure, to indicate that the energy isolating device and the equipment being controlled may not be operated until the tag-out device is removed.

3.10 Tag-Out Device - A prominent warning device, such as a tag and a means of attachment, which can be securely fastened to an energy isolating device in accordance with an established procedure, to indicate that the energy isolating device and the equipment being controlled may not be operated until the tag-out device is removed.

3.11 Qualified Person – One who has the skills and knowledge related to the construction and operation of the electrical equipment and installations and has received safety training on the hazards involved.

4. Responsibility

Responsibility of personnel will be outlined within this procedure as required

5. Methods

5.1 General

5.1.1 Hazard Assessment

Prior to shutdown, the authorized employee will determine the type and magnitude of the energy, the hazards of the energy to be controlled, and the method or means to control the energy. Energy sources that need to be isolated include: electrical, hydraulic fluids under pressure, compressed gases, springs under tension or compression, potential energy from counterweights, and gravity.

5.1.2 The machine or equipment will be turned off using the procedures established for the machine or equipment. An orderly shutdown must be utilized to avoid any additional or increased hazard(s) to employees as a result of the equipment stoppage.

5.1.3 All energy isolating devices that are needed to control the energy to the machine or equipment shall be physically located and operated in such a manner as to isolate the machine or equipment from the energy source(s).

5.1.4 A zero mechanical state will be reached prior to any affected employee performing any service or maintenance on any machine or equipment when unexpected startup or release of stored energy could occur.

5.1.5 A lock-out device will be used to isolate any power source that can produce movement to a machine member. A tag will be placed in conjunction with a lock. The key for the lock will remain under exclusive control of the authorized employee who placed the locking device.

5.1.6 If a lock cannot be used, a tag alone will be used. The tag will be treated as the same level of safety as a lock and will not be bypassed. Tags shall be located in the area of the ignition (stearing wheel, door/window to cab, etc.), and attached by using a lock, zip tie, tape, or other device that prevents the tag from being easily removed.

5.1.7 There may be times and circumstances under which Brandenburg will work under a customer's or group Lock-Out / Tag-Out Program. Additional training may be required to review site specific procedures.

5.2 Locks / Lock-Out

5.2.1 Locks, tags, chains or other hardware shall be provided by Brandenburg for isolating, securing or blocking of machines or equipment from energy sources.

5.2.2 Lock-out devices and tag-out devices shall be singularly identified; shall be the only devices(s) used for controlling energy; shall not be used for other purposes;

5.2.3 If more than one lock will be used, a lock-out device of the standard “scissors type” may be used.

5.2.4 If multiple groups of workers are exposed to hazards, a group lock-out device may be utilized.

5.3 Tags

5.3.1 Lock-out tags are to be attached to at least one padlock on a lock-out.

5.3.2 If a device, valve, switch, control or piece of equipment is locked out, a “danger” tag will be attached.

5.3.3 All tag-out devices must be dated, signed on that tag and stating one of the following: **DO NOT OPERATE, DO NOT START, DO NOT CLOSE or DO NOT ENERGIZE.** Also, the tag shall warn of hazardous conditions if the machine or equipment if energized.

5.3.4 No device, valve, switch, control or piece of equipment will be operated with a lock-out / tag-out device attached regardless of circumstances.

5.4 Energy Control Procedures

5.4.1 This section addresses hazardous energy control requirements which are to be implemented for the practical safeguarding of personnel working on demolition projects. All hazardous energy sources must be identified, marked, locked-out & tagged, and/or disconnected prior to demolition where the unexpected re-energization or contact with electrical services could cause injury. This guideline doesn’t apply to projects where the electrical service for the entire site has been previously terminated & verified.

As required, Zero Energy State Verificaton form (SAF-06) will be completed to verify that all efforts have been taken by non Brandenburg personnel to ensure all sources of energy are at zero state and that adequate protective measures have been taken.

5.4.2 Color Coding

5.4.2.1 Green Paint **–** Marks made with green paint indicate an energy source which has been de-energized and verified to be in a state of zero energy.

5.4.2.2 Red Paint – Marks made with red paint indicate a live electrical service.

5.4.2.3 Extent of color coding will vary depending on the scope of work (e.g. - complete demolition, selective demolition, universal waste removal, interior gut-out, …) and energy sources present. Color coding details will be

included in the site-specific Health & Safety Plan (HASP).Hazard Assessment

5.4.2.4 Prior to demolition, a qualified person will determine the type and magnitude of the electrical services, the hazards of the hazardous energy sources to be cutoff, and the method or means to cutoff the electrical services. All electrical services must be marked with the color coding system in accordance with the site-specific Health & Safety Plan (HASP).

5.4.3 De-Energization Guidelines

5.4.3.1 A zero energy state will be reached, verified, and color coded prior to any employee performing any demolition on any electrical service equipment.

5.4.3.2 Only qualified electricians will handle live electrical equipment with the exception of drop cords and construction tools used by employees. Only qualified electricians will service or maintain temporary electrical services in construction areas and perform electrical disconnects/cut-offs.

5.4.3.3 Only qualified persons will perform electrical system tracing, marking and testing.

5.4.4 Disconnects & Marking

5.4.4.1 Any energized equipment left energized is to be painted red. Additional marking using red danger tape or similar may be necessary in areas where the equipment is difficult to visually identify.

5.4.4.2 Test all lines for energy using testing equipment which is designed for the circuits and electrical equipment they will be connected to and in the environment where they will be used.

5.4.4.3 Regardless of whether a hazardous energy source is energized or not, trace each line back to its source. Check for back feeds. Verify all sources have been de-energized.

5.4.4.4 After verifying the energy feed is de-energized, cut-off each feed at its source and remove at least one (1) foot of wire and / or conduit creating an air gap in order to demonstrate a physical separation. After making the physical separation, mark the de-energized line green at the point of the physical separation. Removal of de-energized equipment will begin at the point of the physical separation.

5.4.5 After Work is Completed

5.4.5.1 Upon completion of the work and removal of any other locks and tag, the authorized employee will clear the system, remove his/her lock and tag and reenergize the system.

5.5 Lock-Out or Tag-Out Devices Removal

When the authorized employee who applied the lock-out or tag-out device is not available to remove it, that device may be removed under the direction of Brandenburg, provided that the following procedures are followed:

5.5.1 The employee in need of the removal will inform the Supervisor.

5.5.2 The Supervisor will verify that the authorized employee who applied the lock-out or tag-out device is not at the facility / project. All reasonable means of contact shall be attempted to reach the employee.

5.5.3 The Supervisor will contact the designated Environmental Health & Safety (EHS) Manager, Equipment Manager, Operations Manager, or Division Manager and request approval to remove the lock and or tag.

5.5.4 Prior to the authorized employee (whose lock and or tag was removed in his / her absence) resuming work on his/her next shift, he/she shall be informed that his/her lock(s) have been removed. If the lock was damaged during removal the authorized employee will receive a new lock and key.

5.6 If an employe removes a lock and or tag without the approval of the EHS Manager, Equipment Manager, Operations Manager, or Division Manager the employee will be subject to disciplinary action up to and including discharge.

5.7 Training

Training will be provided to ensure the components of this procedure are understood by employees and shall include the following:

5.7.1 Authorized employees will be trained in recognition of applicable hazardous energy sources.

5.7.2 Authorized employees will be trained in the methods and means necessary for energy isolation and control.

5.7.3 Affected employees will be trained in the purpose and use of the Hazardous Energy Control Program.

5.7.4 Each employee working in an area where energy control is required will be given training on hazardous energy control procedures including prohibitions on starting equipment that has been locked or tagged out.

5.7.5 Brandenburg will adhere to the guidelines of the project owner's Hazardous Energy Control Program where the program requirements are more stringent than Brandenburg's program requirements.

5.7.6 Each employee will be provided with training on the limitations of tag-out devices

5.7.7 Tags must be legible and durable.

5.7.8 Tag-out devices, where used, shall be affixed in such a manner that will clearly indicate the operation or movement of energy isolating devices from the "safe" or "off" position is prohibited.

5.8 Retraining

Retraining shall be provided for all authorized and affected employees whenever:

5.8.1 There is a change in their job assignments, or

5.8.2 There is a change in machine, equipment or process that present a new hazard, or

5.8.3 When there is a change in energy control procedures

Additional retraining shall also be conducted whenever a periodic inspection reveals, or whenever Brandenburg has reason to believe that there are deviations from or inadequacies in the employee's knowledge or use of the energy control procedures.

5.9 Inspections

Periodic inspections of this procedure will be completed by authorized employees (other than the ones(s) utilizing the energy control procedures).

6. Forms

6.1 Zero Energy State Verification (SAF-06)

7. Regulatory / Permit Requirements

29 CFR 1910.147

8. Recordkeeping

Documentation of tag and lock removal and any associated forms will be retained in the project file and per Records Retention Form, QUA-05

Title	Date	Reference	Area
Fall Protection	**7/23/2012**	**3.05**	**Safety**

1. Summary

Brandenburg projects may potentially expose workers to a variety of fall hazards. Where fall hazards exist, this procedure must be adhered to.

2. Scope

All applicable Brandenburg personnel and work sites will be outlined within this procedure as required

3. Definitions

3.1 Anchorage – A secure point to attach a lanyard, lifeline, or deceleration device capable of supporting 5000 lbs

3.2 Competent Person - One who is capable of identifying existing and predictable hazards in the surroundings, or working conditions which are unsanitary, hazardous, or dangerous to employees, and who has authority to take prompt corrective measures to eliminate them.

3.3 Controlled Access Zone (CAZ) - An area where work may take place without the use of guardrail, personal fall arrest or safety net systems and access to the CAZ is controlled.

3.4 Deceleration Device – Any mechanism such as a rope grab, rip stitch lanyard, etc., that serves to dissipate a substantial amount of energy during a fall arrest or otherwise limits the energy imposed on an employee during fall arrest.

3.5 Deceleration Distance - The distance between the location of an employee's harness attachment point at the moment of activation (at the onset of fall arrest forces) of the deceleration.

3.6 Free Fall - Falling before a personal fall arrest system begins to apply force to arrest the fall.

3.7 Hole - A gap or void two (2) inches or more in its least dimension in a floor, roof or walking/working surface.

3.8 Infeasible - When it is impossible to perform the work using a conventional fall protection system.

3.9 Lanyard - A flexible line for connecting the harness to a deceleration device, lifeline or anchorage.

3.10 Leading Edge - The edge of a floor, roof, or formwork for a floor or other walking/working surface (such as the deck) which changes location as additional work is being performed. A leading edge is considered to be an "unprotected side and edge" during periods when it is not actively and continuously under construction.

3.11 Lifeline - A component consisting of a flexible line (either vertical or horizontal) for connection to an anchorage at one end or both ends that serves as a means for connecting other components of a personal fall arrest.

3.12 Opening - A gap or void thirty (30) inches or more high and eighteen (18) inches or more wide in a wall or partition through which employees can fall to a lower level.

3.13 Personal Fall Arrest System - A system used to arrest an employee in a fall from a working level. It consists of an anchorage, connectors or harness, and may include a lanyard, deceleration device, lifeline, or suitable combination of these. The use of a body belt for fall arrest is prohibited.

3.14 Qualified Person – One who, by possession of a recognized degree, certificate, or professional standing, or who by extensive knowledge, training, and experience, has successfully demonstrated the ability to solve or resolve problems relating to the subject matter, the work or the project.

3.15 Roof - The exterior surface of the top of the building. This does not include any temporary surface of a building.

3.16 Safety Monitoring System - A safety system in which a competent person is responsible for recognizing and warning employees of fall hazard.

3.17 Unprotected Sides and Edges - Any side or edge (except at entrances to points of access) of a walking / working surface; for example, floor, roof, ramps, bridges, or runways where there is no wall or guardrail system at least 39 inches high.

3.18 Walking / Working Surface - Any surface on which an employee walks or works, including, but not limited to floors, roofs, ramps, bridges, runways, etc. but, NOT including ladders, vehicles, or trailers, on which employees must be located in order to perform their job duties.

3.19 Warning Line System - A barrier erected on a roof to warn employees that they are approaching an unprotected roof side or edge, and that designates an area in which roofing work may take place without the use of guardrail, body harness or safety net systems to protect employees in the area.

4. Responsibility

Responsibility of personnel will be outlined within this procedure as required

5. Methods

5.1 General Requirements for Fall Protection

5.1.1 Every worker exposed to a fall hazard greater than six (6) feet will be protected by a fall protection system. This fall protection system may include guardrail systems, personal fall arrest systems or others.

5.1.2 A hazard assessment will take place prior to the inception of site work activity. This hazard assessment may be in the form of a Task Safety Analysis (TSA), safety survey, daily safety meeting, site-specific Health and Safety Plan (HASP), or similar.

5.1.3 Where conventional fall protection is infeasible or creates a greater hazard, a Fall Protection Plan prepared by a qualified person may be used. Additional control methods including but not limited to Controlled Access Zones (CAZ), Safety Monitoring Systems, and Warning Line Systems may also be used.

5.2 Safety Monitoring System

5.2.1 The Supervisor may designate a competent person to monitor the safety of employees, and ensure that the Safety Monitor complies with the following:

5.2.1.1 Shall be competent to recognize fall hazards,

5.2.1.2 Shall warn employees when it appears the employee is unaware of a fall hazard or is acting in an unsafe manner,

5.2.1.3 Shall be on the same walking / working surface and within visual sighting distance of the employee being monitored,

5.2.1.4 Shall be close enough to communicate orally with the employee, and

5.2.1.5 Shall not have other responsibilities which could take the Safety Monitor's attention from the monitoring function

5.3 Controlled Access Zone (CAZ)

5.3.1 When used to control access to areas where demolition activities are taking place, the CAZ will be defined by a control line or other means that restricts access.

5.3.2 When control lines are used, they will be erected not less than six (6) feet nor more than twenty-five (25) feet from the unprotected edge.

5.3.3 The control line will extend along the entire length of the unprotected edge, and will be approximately parallel to the unprotected edge.

5.3.4 Each line or barricade will be flagged or otherwise clearly marked at not more than six (6) feet intervals with high-visibility material.

5.3.5 Each line shall be rigged and supported in such a way that at its lowest point (including sag) it is not less than 39 inches nor more than 45 inches from the walking / working surface.

5.4 Warning Line System

5.4.1 Shall be erected around all sides of the roof work area

5.4.2 When mechanical equipment is not being used, the warning line will be erected not less than six (6) feet from the roof edge.

5.4.3 When mechanical equipment is being used, the warning line systems will be erected not less than six (6) feet from the roof edge that parallels the direction of the mechanical equipment operation, and not less than ten (10) feet from the roof edge that is perpendicular to the direction of the mechanical equipment operation.

5.4.4 Warning lines shall be flagged at not less than six (6) feet intervals with high visibility material.

5.4.5 Rope, wire or chain will be rigged and supported in such a way that its lowest point (including sag) is no less than thirty-four (34) inches from walking / working surface, and its highest point is no more than thirty-nine (39) inches from the walking / working surface.

5.4.6 The rope, wire or chain will have a minimum tensile strength of five hundred (500) pounds, and after being attached to the stanchions will maintain a tensile strength of two hundred (200) pounds with downward / outward deflection.

5.4.7 Stanchions must be capable of resisting, without tipping over, a force of at least sixteen (16) pounds applied horizontally.

5.4.8 No worker will be allowed in the area between a roof edge and a warning line unless the worker is performing roofing work in that area.

5.5 Protection from Falling Objects

5.5.1 Toeboards, when used as falling object protection, will be erected along the edge of the overhead walking / working surface for a distance sufficient to protect employees below.

5.5.2 Toeboards will be capable of withstanding, without failure, a force of at least fifty (50) pounds in a downward or outward direction.

5.5.3 Toeboards will be a minimum of three and one-half (3 1/2) inches in vertical height from their top edge to the level of the walking / working surface. They shall not have more than a ¼ inch clearance above the walking / working surface.

5.6 Covers

5.6.1 Covers located in roadways and vehicular aisles shall be capable of supporting at least twice the maximum axle load of the largest vehicle expected to cross over the cover.

5.6.2 All other covers shall be capable of supporting at least twice the weight of employees, equipment and materials that may be imposed on the cover.

5.6.3 All covers will be secured when installed to prevent accidental displacement by wind, equipment or employees.

5.6.4 All covers will be color coded or will be marked with the word "**hole"** or "**cover"** to provide a warning of the hazard.

5.7 Guardrail Systems

5.7.1 The guardrail system must be capable of withstanding a force of at least 200 lbs., applied within two (2) inches of the top edge in any outward or downward direction, and guardrail must not deflect to a height less than 39 inches above walking / working level.

5.7.2 Toprails and midrails must be at least one quarter inch nominal diameter. Where wire rope is used as a toprail, it must be flagged no less than every six (6) feet with a highly visible material.

5.7.3 Toprails must be 42” plus or minus 3” above the walking / working level. Where no walls or parapet walls exist or are less than 21” high as measured from the walking / working surface, midrail supports, screens, mesh, intermediate vertical members, or equivalent intermediate structural members shall be installed between the top edge of the guardrail system and the walking / working surface.

5.7.4 Midrails will be installed at a height midway between the top edge of the guardrail and the walking / working level. Midrails will be capable of withstanding a force of at least 150 lbs. applied in any downward or outward direction at any point along the rail.

5.7.5 Intermediate members, such as balusters, when used between posts will be no more than 19” apart. Guardrail systems, when used around holes, shall be erected on all unprotected sides or edges of the hole.

5.7.6 Guardrails must be surfaced in a way that will prevent punctures or lacerations and to prevent snagging of clothing. Double head forming nails, if used, must be driven flush in the wood rails.

5.7.7 The ends of the top rails and midrails must not overhang terminal posts, unless an overhang would not create a projection hazard.

5.7.8 Steel and plastic banding will not be used on top and midrails.

5.8 Personal Fall Arrest Systems

5.8.1 Only currently approved devices will be used. (Back belts are not allowed, non-locking snap hooks are not allowed).

5.8.2 Connectors will be drop forged, pressed or formed steel, or equivalent.

5.8.3 Connectors will have a corrosion-resistant finish, and be smooth to prevent damage to interfacing.

5.8.4 Dee-rings and snaphooks will have a minimum tensile strength of 5000 lbs.

5.8.5 Horizontal lifelines will be designed, installed and used under the supervision of a qualified person, as part of a fall arrest system that maintains a safety factor of at least two.

5.8.6 Lanyards and vertical lifelines will have a minimum breaking strength of 5000 lbs.

5.8.7 When vertical lifelines are used, each employee will be attached to a separate lifeline.

5.8.8 Lifelines will be protected against being cut or abraded.

5.8.9 Self-retracting lifelines and lanyards which automatically limit free fall distance to two (2) feet or less shall be capable of sustaining a minimum tensile load of 3,000 pounds applied to the device with the lifeline / lanyard in the fully extended position.

5.8.10 Self-retracting lifelines and lanyards which do **not** automatically limit free fall distance to two (2) feet or less must also be capable of sustaining a minimum tensile load of 5000 lbs applied to the device with the lifeline or lanyard in the fully extended position.

5.8.11 Ropes and straps used in lanyards, lifelines and strength components in belts and harnesses will be made from synthetic fibers.

5.8.12 Anchor points used for attachment of personal fall arrest equipment will be:

5.8.12.1 Independent of any anchorage being used to support or suspend platforms and capable of supporting at least 5000 lbs per employee, or

5.8.12.2 Shall be designed, installed, and used as follows:

5.8.12.2.1 As part of a complete personal fall arrest system which maintains a safety factor of at least two; and

5.8.12.2.2 Under the supervision of a qualified person

5.8.13 Personal fall arrest systems will:

5.8.13.1 Limit maximum arresting forces to 1800 lbs. on an employee using a body harness,

5.8.13.2 Be rigged such that an employee can neither free fall more than six (6) feet (1.8 m), nor contact any lower level,

5.8.13.3 Limit maximum deceleration distance to 3.5 ft., and

5.8.13.4 Have sufficient strength to withstand twice the potential impact energy of an employee free falling six (6) feet or the free fall distance permitted by the system, whichever is less.

5.8.14 Personal fall arrest systems and their components will be used only for employee protection and not to hoist materials.

5.8.15 Personal fall arrest systems and their components subjected to impact loading shall be immediately removed from service.

5.8.16 In the event of a fall, the fallen worker will be promptly rescued.

5.8.17 Personal fall arrest systems will be inspected prior to each use, and defective components will be removed from service.

5.8.18 Personal fall arrest systems will not be attached to guardrail systems.

5.9 Training

5.9.1 Training will be provided to all Brandenburg employees who may be exposed to fall hazards.

5.9.2 Each employee will be trained to recognize fall hazards and on the procedures to be followed in order to minimize these hazards.

5.9.3 A written certification record will be prepared for each employee trained by using a Fall Protection Certificate of Training (SAF-12A).

5.9.4 Retraining will be conducted on an annual basis, or

5.9.4.1 Anytime Brandenburg has a reason to believe that any affected employee who has already been trained does not have the understanding and skill required by said training,

5.9.4.2 When changes in the workplace render previous training obsolete,

5.9.4.3 When changes in the types of fall protection systems or equipment to be used render previous training obsolete, or

5.9.4.4 When inadequacies in an affected employee's knowledge or use of fall protection systems or equipment indicate that the employee has not retained the requisite understanding or skill.

6. Forms

6.1 Fall Protection Certificate of Training (SAF-12A)

7. Regulatory / Permit Requirements

29 CFR 1926.500 - 503

8. Recordkeeping

Employee training records are maintained per Employee Files, SOP and Records Retention Form, QUA-05.

Title	Date	Reference	Area
Trenching - Excavation	**7/23/2012**	**3.06**	**Safety**

1. Summary

Brandenburg projects may potentially expose workers to hazards associated with trenching or excavation. When trenches, excavations, or depressions in the earth's surface are being worked on or around, this procedure shall be adhered to.

2. Scope

All applicable Brandenburg personnel and work sites will be outlined within this procedure as required

3. Definitions

3.1 Competent Person - One who is capable of identifying existing and predictable hazards in the surroundings, or working conditions which are unsanitary, hazardous, or dangerous to employees, and who has authority to take prompt corrective measures to eliminate them.

3.2 Excavation - Any man-made cut, cavity, trench or depression in an earth surface, formed by earth removal.

3.3 Protective System - A method of protecting employees from cave-ins, from material that could fall or roll from an excavation face or into an excavation, or from the collapse of adjacent structures. This protective system may include benching, sloping, shoring or others.

3.4 Trench - An excavation which is narrow relative to length. Typically the depth is greater than its width, and the width is less than 15 feet.

3.5 Sloping - A method of protecting employees from cave-ins by excavating to form sides of an excavation that are inclined away from the excavation so as to prevent cave-ins. The angle of incline required to prevent a cave-in varies with differences in such factors as the soil type, environmental conditions of exposure, and application of surcharge loads.

3.6 Benching - A method of protecting employees from cave-ins by excavating the sides of an excavation to form one or a series of horizontal levels or steps, usually with vertical or near-vertical surfaces between levels.

3.7 Type A Soil - Cohesive soil with an unconfined compressive strength of 1.5 tons per square foot. These include clay, silty clay, sandy clay, clay loam, calcite, hardpan, and sometimes silty clay loam and sandy clay loam. No soil should be classified as Type A if: it is fissured, subject to vibration from traffic, pile driving, or similar effects; it was previously disturbed, or part of a sloped layered system where the slope is four horizontal to one vertical or greater.

3.8 Type B Soil - Cohesive soil with an unconfined compressive strength greater than 0.5 tons per square foot but less than 1.5 tons per square foot. This includes granular cohesionless soils like angular gravel, silt, silt loam, sandy loam, and sometimes silty clay loam and sandy clay loam; previously disturbed soils that are not Type C; fissured soils and soils subject to vibration that would otherwise be classified as Type A; dry rock that is not stable; and material that is part of a sloped, layered system where the layers dip on a slope less steep than four horizontal to one vertical.

3.9 Type C Soil - Cohesive soil with an unconfined compressive strength of 0.5 tons per square foot or less. Type C soils include granular soils such as gravel, sand, and loamy sand; submerged soil; soil from which water is freely seeping; submerged rock that is not stable; or material in a sloped, layered system where the layers dip into the excavation at a slope of four horizontal to one vertical or steeper.

3.10 Unconfined Compressive Strength - The load per unit area at which soil will fail in compression.

3.11 Short Term Exposure - A period of time less than or equal to 24 hours that an excavation is open

4. Responsibility

Responsibility of personnel will be outlined within this procedure as required

5. Methods

5.1 General

5.1.1 A hazard assessment will take place prior to the inception of site work activity. This hazard assessment may be documented as part of the Engineering Survey or site-specific Health and Safety Plan (HASP), as a Task Safety Analysis (TSA), or in another similar document.

5.1.2 Utility companies or owners shall be contacted within established or customary local response times, advised of the proposed work, and asked to locate the underground utilities that reasonably may be expected to be encountered during excavation work prior to the start of actual excavation.

5.1.3 When utility companies or owners cannot respond to a request to locate underground utility installations within 24 hours (unless a longer period is required by state or local law), or cannot establish the exact location of these installations, the Supervisor may proceed, provided the Supervisor does so with caution, and provided detection equipment or other acceptable means to locate utility installations are used.

5.1.4 Prior to commencing excavation or trenching, the Supervisor will utilize the hazard assessment to determine if all hazards have been addressed and that qualified workers are assigned to the task.

5.1.5 Daily inspections of excavations, the adjacent areas, and protective systems shall be made by a competent person prior to the start of work and as needed throughout the shift. Inspections shall also be made after every rainstorm or other hazard increasing occurrence. These inspections are only required when employee exposure can be reasonably anticipated.

5.1.6 Where the competent person finds evidence of a situation that could result in a possible cave-in, indications of failure of protective systems, hazardous atmospheres, or other hazardous conditions, exposed employees shall be removed from the hazardous area until the necessary precautions have been taken to ensure their safety.

5.1.7 Workers will not be allowed to work in excavations where water is accumulating unless adequate precautions have been taken to protect employees against the hazard posed by the water accumulation. If water accumulation is controlled or prevented by water removal equipment the competent person must monitor the water removal equipment and operations to ensure proper operation.

5.1.8 If the stability of adjoining buildings or walls or other structures is endangered by an excavation or operations, support systems such as shoring, bracing, or underpinning will be provided. Excavations and trenching that are adjacent to backfilled excavations or trenching, or which are subject to vibrations from railroad traffic, highway traffic, or the operation of machinery (e.g., shovels, derricks, cranes, trucks) will be secured by support systems, shield systems or other protective systems; i.e., sheet piled, shored, and braced.

5.1.9 Each employee at the edge of a well, pit, shaft, and similar excavation six (6) feet (1.8 m) or more in depth shall be protected from falling by guardrail systems, fences, barricades, or covers.

5.1.10 Each employee at the edge of an excavation six (6) feet (1.8 m) or more in depth shall be protected from falling by guardrail systems, fences, or barricades when the excavations are not readily seen because of plant growth or other visual barrier.

5.2 Access

5.2.1 In trenching four (4) feet or more in depth, ladders, stairways, ramps or other safe means of access and egress shall be provided and located at intervals of 25 feet or less lateral travel. If a ladder is used, the ladder will extend three (3) feet above the original surface of the ground and must be secured.

5.2.2 Walkways will be provided at all excavations where employees or equipment are required or permitted to cross over. Guardrails shall be provided where walkways are six (6) feet or more above lower levels.

5.3 Set Back

5.3.1 Employees shall be protected from excavated or other materials or equipment that could pose a hazard by falling or rolling into excavation. Protection shall be provided by placing and keeping such materials or equipment at least two (2) feet from the edge of the excavation, or by the use of retaining devices that are sufficient to prevent materials or equipment from falling or rolling into excavations or by combination of both.

5.4 Equipment

5.4.1 When mobile equipment is operated adjacent to an excavation, or when such equipment is required to approach the edge of an excavation, and the operator does not have a clear and direct view of the edge of the excavation, a warning system shall be utilized such as barricades, hand or mechanical signals, or stop logs. If possible, the grade should be away from the excavation.

5.4.2 No one will be allowed under loads handled by lifting or digging equipment or near vehicles being loaded/unloaded by such equipment. Employees exposed to public vehicular traffic operating in the area of excavation or trenching will be provided with and instructed to wear hi-visibility vests.

5.5 Hazardous Atmospheres

5.5.1 Where oxygen deficiency (atmospheres containing less than 19.5 percent oxygen) or a hazardous atmosphere exists or could reasonably be expected to exist, such as in excavations in landfill areas or excavations in areas where hazardous substances are stored nearby, the atmospheres in the excavation shall be tested before employees enter excavations greater than four (4) feet (1.22 m) in depth.

5.5.2 Adequate precautions shall be taken to prevent employee exposure to atmospheres containing less than 19.5 percent oxygen and other hazardous atmospheres.

5.5.3 Adequate precaution shall be taken such as providing ventilation, to prevent employee exposure to an atmosphere containing a concentration of a flammable gas in excess of 20 percent of the lower flammable limit of the gas

5.5.4 When controls are used that are intended to reduce the level of atmospheric contaminants to acceptable levels, testing shall be conducted as often as necessary to ensure that the atmosphere remains safe.

5.6 Excavation Protective Systems

5.6.1 General

5.6.1.1 Each employee in an excavation shall be protected from cave-ins by an adequate protective system. Exceptions to this requirement include:

5.6.1.1.1 Excavations made entirely in stable rock; or

5.6.1.1.2 Excavations are less than five (5) feet in depth and examination of the ground by a competent person provides no indication of a potential cave-in.

5.6.1.2 Protective systems shall have the capacity to resist without failure all loads that are intended or could reasonably be expected to be applied or transmitted to the system.

5.6.1.3 Designs of support systems, shield systems and other protective systems will be selected and constructed in accordance with applicable standards.

5.6.1.4 Prior to excavation, a line up meeting will be held by the Supervisor and/or the competent person with the excavation crew to: review the excavation plan, job site hazards, and protective measures and equipment.

5.6.1.5 All materials and equipment used for protective systems will be free of damage or defects, and maintained in a manner that will prevent employee exposure to hazards.

5.6.2 Soil Classification

When using protective systems requiring soil classification, each soil and rock deposit shall be classified by a competent person as "Stable Rock, Type A, Type B or Type C." The classification shall be made based on the results of at least one (1) visual and at least one (1) manual analysis. Such analysis will be conducted by a competent person using acceptable visual and manual tests or other recognized methods of soil classification. The manual test consists of soil plasticity, dry strength, drying test, thumb penetration, pocket penetrometer or a hand operated shearvane.

5.6.3 Sloping / Benching System

The slopes and configurations of sloping and benching systems for excavations five (5) feet to twenty (20) feet in depth must be selected and constructed by the competent person or his/her designee and shall be in accordance with the following table:

Soil or Rock Type	**Maximum Allowable Slopes (H:V)**
Stable Rock	**Vertical (90°)**
Type A	**¾:1 (53°)**
Type B	**1:1 (45°)**
Type C	**1 ½:1 (34°)**

5.6.3.1 A short-term maximum allowable slope of 1/2H:1V (63º) is allowed in Type A soil excavations that are twelve (12) feet or less in depth. Short-term maximum allowable slopes for excavations greater than twelve (12) feet depth shall be 3/4H:1V (53º).

5.6.3.2 No soil classification is required if a maximum slope of 1 ½:1 (34°) is used.

5.6.3.3 Sloping or benching for excavations greater than twenty (20) feet deep will be designed by a registered professional engineer.

5.7 **Permit System**

5.7.1 A Trenching-Excavation Permit (SAF-25) may be required as outlined in the site-specific Health & Safety Plan (HASP), customer requirements, or other governing institution. When required, the permit will be issued by the Supervisor, posted in the work area, and be available for review by Brandenburg's Environmental Health & Safety (EHS) Manager, customer representative, or other third party as requested. Brandenburg may use customer permits, or use permits available through outside sources as long as the basic information is the same.

5.7.1.1 Permits are valid for one work shift. (The life of a permit shall not exceed twelve (12) hours.)

5.7.1.2 When the excavation operation has been completed, or when the permit expires, permits shall be kept on file in the project files.

5.7.2 The Supervisor in charge of the work will:

5.7.2.1 Fill out the permit as required, and

5.7.2.2 Ensure that all approval signatures are on the permit.

5.7.3 The equipment operator will ensure that excavation DOES NOT begin until the permit is present at the excavation site.

5.7.4 The permit will be maintained at the site of excavation during the entire time the excavation is being accomplished.

5.8 Training

Affected employees shall be instructed in the recognition and avoidance of unsafe excavation conditions and the methods used to control or eliminate said hazards.

6. Forms:

6.1 Trenching / Excavation Permit (SAF-25)

7. Regulatory / Permit Requirements:

29 CFR 1926.650

29 CFR 1926.21

8. Record Keeping:

All completed permits will be retained in the project file and per Records Retention Form, QUA-05.

Title	Date	Reference	Area
Portable Ladder Control and Inspection	**7/23/2012**	**3.07**	**Safety**

1. Summary

This procedure provides a method to ensure that all Brandenburg personnel use portable ladders safely or in a safe manner.

2. Scope

All applicable Brandenburg personnel and work sites will be outlined within this procedure as required

3. Definitions

3.1 Type I Ladder - Portable ladder that supports at least 250 pounds of weight.

3.2 Type IA Ladder – Industrial portable ladder that supports at least 300 pounds of weight.

3.3 Competent Person – A person having the capability of identifying existing and predictable hazards in the surroundings, or working conditions which are unsanitary, hazardous, or dangerous to employees, and who has authority to take prompt corrective measures to eliminate them.

4. Responsibility

Responsibility of personnel will be outlined within this procedure as required

5. Methods

5.1 General

All portable ladders must be inspected by a competent person for visible defects on a periodic basis and after any occurrence that could affect their safe use. All employees required to use portable ladders will be trained as per 29 CFR 1926.1060.

5.2 Inspecting Ladders

Ladders will be inspected for bends, dents, cracks, loose or missing rivets, disconnected braces and corrosion. Any defective ladders shall either be immediately marked in a manner that readily identifies them as defective, or be tagged with "Do Not Use" or similar language, and shall be withdrawn from service until repaired.

5.3 Safe Work Practices

Ladders shall be used only for the purpose for which they were designed. All practical attempts will be made to use alternative work methods to eliminate the need to utilize portable ladders. If an employee must work from a portable ladder, the following rules must be adhered to:

5.3.1 Ladders shall be secured from displacement when required.

5.3.2 Ladders shall not be loaded beyond the maximum intended load for which they were built, or beyond the manufacturer's rated capacity.

5.3.3 Ladders shall be on a firm and level base.

5.3.4 Ladders shall extend at least 36’’ above the landing when used for access/egress.

5.3.5 Ladders shall have slip-resistant feet when used on slippery surfaces.

5.3.6 Ladders shall not be moved, shifted, or extended while occupied.

5.3.7 Straight ladders must be placed at the proper angle. The base of the ladder must be ¼ of the height. For example, if the ladder extends upward on a wall that is twelve (12) feet tall, the base of the ladder should be approximately three (3) feet from the wall.

5.3.8 Each worker is required to inspect all ladders prior to use.

5.3.9 Ladders shall be maintained free of oil, grease and other slippery hazards.

5.3.10 “A” frame ladders must be used in the fully open, “A” position with the locks fully down and engaged.

5.3.11 When working off of a ladder, the employee shall not reach in either direction to the point where the employee’s belt buckle extends outside of the framework of the ladder.

5.3.12 When ascending or descending a ladder, the user shall face the ladder.

5.3.13 Each employee shall use at least one hand to grasp the ladder when progressing up and/or down the ladder.

5.3.14 An employee shall not carry any object or load that could cause the employee to lose balance and fall.

5.3.15 No more than one person shall work from a portable ladder unless it is specifically designed for two people.

5.3.16 Ladders will only be used for the type of service for which they are intended.

5.4 Ladder Specifications

5.4.1 The length of single ladders or individual sections of ladders shall not exceed 30 feet.

5.4.2 Two section ladders shall not exceed 48 feet in length.

5.4.3 Ladders over two sections shall not exceed 60 feet in length.

5.4.4 All straight and extension ladders must have non-slip feet.

5.4.5 Stepladders and platform ladders must not be longer than 20 feet.

5.4.6 Wooden ladders must not be painted, except for identification or warning labels.

5.4.7 Portable ladders shall be constructed of fiberglass or other nonconductive material.

5.4.8 Type 1A ladders, as a minimum, are required for all Brandenburg projects.

5.5 Storing and Transporting Ladders

5.5.1 When ladders are not in use, they will be properly stored to prevent damage.

6. Forms

None

7. Regulatory / Permit Requirements

29 CFR 1926.1053

29 CFR 1910.26

8. Record Keeping

None

Title	Date	Reference	Area
Scaffolding	**7/23/2012**	**3.08**	**Safety**

1. Summary

This procedure defines the requirements, practices, and procedures to protect Brandenburg employees from hazards while working from a scaffold and during the erection and dismantling of a scaffold.

2. Scope

All applicable Brandenburg personnel and work sites will be outlined within this procedure as required

3. Definitions

3.1 Brace – A rigid connection that holds one scaffold member in a fixed position with respect to another member, or to a building structure.

3.2 Competent Person – A person who is capable of identifying existing and predictable scaffold related hazards, and who has the authorization to take prompt corrections measures to eliminate them.

3.3 Guardrail System - A vertical barrier, consisting of, but not limited to, top rails, midrails, and posts, erected to prevent employees from falling off a scaffold platform or walkway to lower levels.

3.4 Maximum Intended Load - The total load of all persons, equipment, tools, materials, transmitted loads, and other loads reasonably anticipated to be applied to a scaffold or scaffold component at any one time.

3.5 Scaffold – Any temporary elevated platform and its supporting structure, used for supporting employees or materials or both.

3.6 Supported Scaffold - One or more platforms supported by outrigger beams, brackets, poles, legs, uprights, posts, frames, or similar rigid support.

4. Responsibility

Responsibility of personnel will be outlined within this procedure as required

5. Methods

5.1 General Scaffolding Requirements:

5.1.1 A competent person shall be present during the erection (setting up) and dismantling (taking down) of the scaffold.

5.1.2 All scaffolding erected shall be in compliance with dimensions listed in OSHA standards 29 CFR 1926 Subpart (L). All persons who use, build, modify or dismantle scaffold require specific training (see section 5.2.1).

5.1.2.1 Scaffolding shall be constructed so as to support its own weight and at least four (4) times the maximum weight anticipated.

5.1.2.2 Footings shall be level, sound, rigid and capable of carrying the full load without settling or displacement and shall be secured against movement in any direction. All scaffolds not setting on a firm foundation must bear on base plates <u>and</u> mud sills.

5.1.3 The competent person shall inspect the scaffold prior to each work shift. Scaffold Inspection Report (SAF-26) may be used as guidance during inspections. Inspections must also take place after any occurrence that could affect the structural integrity.

5.1.4 Following inspection and prior to employee access of scaffold, the competent person shall attach an easily identifiable safety tag when required by the site-specific Health and Safety Plan (HASP) and/or a customer policy.

5.1.4.1 The GREEN scaffold tag shall be used when the scaffold passes inspection and meets all requirements of OSHA 29 CFR 1926, Subpart L.

5.1.4.2 The YELLOW scaffold tag shall be used if the structure does not meet all the requirements of a green tagged scaffold. Work can continue on this type of scaffold platform but each worker must wear approved fall protection (PFAS) and be attached to a proper anchorage point.

Examples of when a YELLOW tag shall be used include, but are not limited to, when top or mid rails can not be put in place because of equipment or existing construction (pipes, I beams); when a scaffold plank has been removed from a platform (i.e. to pass equipment); or anytime the working platform, top or mid rails, have been modified in order to place material around the platform work area.

5.1.4.3 The RED tag shall be used while a scaffold is being erected, taken down, or has been found to be defective. (Only scaffold erection and dismantling personnel may work off scaffolding with a RED tag). Any worker has the right to pull a tag from the holster and deem the scaffold “RED tagged” if they see an unsafe condition.

5.1.5 Each employee on a scaffold more than ten (10) feet above a lower level shall be protected from falling to that lower level. Types of fall protection to be provided on each type of scaffold will be in accordance with 29 CFR 1926.451(g)(1)(i) through (vii). Fall protection for employees erecting or dismantling supported scaffolds will be provided where the installation and use of such protection is feasible and does not create a greater hazard.

5.1.5.1 Handrails / guardrails shall be installed no less than 38 ” or not more than 45 ” high on all open sides or ends of platforms more than ten (10) feet above the ground or floor.

5.1.5.2 The midrail shall be installed ½ the distance from the working platform to the top edge of the handrail / guardrail.

5.1.5.3 Toeboards shall be installed on any platform over ten (10) feet above grade or floor. Toeboards are also required on any intermediate platform with people working below, regardless of height above grade or floor. Material shall be nominally 1” thick and extend at least 3 ½” up from the working platform.

5.1.6 Workers are prohibited from walking or working underneath the scaffold. If this prohibition is not possible, a wire mesh screen shall be secured to the midrail and the toeboard.

5.1.7 All scaffold components shall be maintained in good condition. Any disturbed, bent, or broken pieces shall be immediately replaced, repaired or removed from service.

5.1.8 Planks shall be made of scaffold grade lumber or the equivalent. This shall be either stamped or branded on the plank end or top.

5.1.9 Scaffold (wood) planks shall not have any splits greater than twelve (12) inches in length. The planks may not have any loose knots or cuts from saws.

5.1.10 Each end plank shall extend beyond the frame support at least six (6) inches. If a plank is ten (10) feet or less in length, it shall not extend over the support more than twelve (12) inches. If the plank is more than ten (10) feet in length it will not extend over the support more than 18 inches.

5.1.11 Each working platform shall be fully planked or decked from the front uprights to the guardrail supports.

5.1.12 All parts of the scaffolds shall be strong and rigidly braced, and secured to prevent movement or displacement.

5.1.13 Employees shall be prohibited from working on scaffolds covered in ice, snow, or other slippery material except as necessary to remove such materials. Good housekeeping practices shall be maintained at all times on the working platform of the scaffold; as well as at the base and at the point of access to the scaffold.

5.1.14 The front edge of all working platforms shall not exceed fourteen (14) inches from the face of the work.

5.1.15 When scaffold platforms are more than two (2) feet (0.6 m) above or below a point of access, portable ladders, hook-on ladders, attachable ladders, stair towers (scaffold stairways/towers), stairway-type ladders (such as ladder stands), ramps, walkways, integral prefabricated scaffold access, or direct access from another scaffold, structure, personnel hoist, or similar surface shall be used as a means of access.

5.1.16 Cross bracing shall not be used as an access ladder. Scaffold frames may be used to access working levels only if the manufacturer has designed the frame to be used as an access ladder and that the scaffold is erected according to the manufacturer's guidelines or instructions.

5.1.17 The clearance between scaffolds and power lines shall be as follows: scaffolds shall not be erected, used, dismantled, altered or moved such that they or any conductive material handled on them might come closer to exposed and energized power lines than as follows:

Insulated lines	< 300V	3' minimum distance
Insulated lines	>300V to <50 KV	10’ minimum distance
Insulated lines	> 50KV	10' plus 0.4” for each KV over 50K
Uninsulated lines	< 50KV	10'
Uninsulated lines	> 50KV	10' plus 0.4" for each KV over 50K

5.1.18 Scaffolds and materials may be closer to power lines than specified above where such clearance is necessary for performance of work, and only after the utility company, or electrical system operator, has been notified of the need to work closer and the utility company, or electrical system operator, has de-energized the lines, relocated the lines, or installed protective coverings to prevent accidental contact with the lines.

5.1.19 Scaffolds shall be erected using base plates on the bottom most frames.

5.1.20 Unstable type objects such as bricks, concrete blocks, scrap wood, etc., shall not be used to support a scaffold or working platform.

5.1.21 All scaffolds shall be level and plumb. The competent person shall ensure that the scaffold is level and plumb prior to the start of work and on a daily basis or if the scaffold conditions change.

5.1.22 Frames that are stacked or connected together shall be secured together. If the possibility of uplift is present, the scaffold frames shall be locked together.

5.1.23 Crossbracing is acceptable in place of a midrail when the crossing point of two braces is between twenty (20) inches and thirty (30) inches above the work platform or as a toprail when the crossing point of two braces is between 38 inches and 48 inches above the work platform. The end points at each upright shall be no more than 48 inches apart.

5.1.24 When planks are overlapped to create a longer work platform, the overlap shall not be less the twelve (12) inches unless secured by other means and the overlap only occurs over the frame support.

5.1.25 Scaffold shall be guyed or tied to the structure; or braced to prevent tipping when the height of the scaffold is more than four (4) times that of the base width of the scaffold. The scaffolding shall be tied securely to structures or equipment to prevent tipping over. Ties shall not be spaced more than 30 feet horizontally or 26 feet vertically.

5.1.25.1 Tube and coupler clamps with staging pieces may be used instead of tie-wires to stabilize staging.

5.1.25.2 In no case shall scaffolding be secured to instrument or electrical conduit or to piping 2" or less in diameter.

5.1.26 Scaffolds with a height to base width (including outrigger supports, if used) ratio of more than four to one (4:1) shall be restrained from tipping by guying, tying, bracing, or equivalent means installed at locations where horizontal members support both inner and outer legs. Guys, ties and bracing shall be installed according to the manufacturer's recommendations or at the closest horizontal member to the 4:1 height and repeated vertically at locations of horizontal members every 26 feet or less (20 feet for scaffolds 3 feet wide or less).

5.1.27 Ties, guys, braces, or outriggers shall be used to prevent the tipping of supported scaffolds in all circumstances where an eccentric load, i.e. a cantilevered work platform, is applied or is transmitted.

5.1.28 No unauthorized persons will change or alter the scaffold system.

5.1.29 No persons shall ride a mobile scaffold system while it is being moved.

5.2 Training

5.2.1 Each employee who performs work while on a scaffold shall be trained by a person qualified in the subject matter to recognize the hazards associated with the type of scaffold being used and to understand the procedures to control or minimize those hazards

Training should include the following areas, as applicable:

5.2.1.1 The nature of any electrical hazards, fall hazards and falling object hazards in the work area;

5.2.1.2 The correct procedures for dealing with electrical hazards and for erecting, maintaining, and disassembling the fall protection systems being used;

5.2.1.3 The proper use of the scaffold, and the proper handling of materials on the scaffold; and

5.2.1.4 The maximum intended load and the load-carrying capacities of the scaffolds used

5.2.2 All workers involved in the erection and dismantling of scaffolds and scaffolding shall be trained in the hazards associated with such operations. Each employee who is involved in erecting, disassembling, moving, operating, repairing, maintaining, or inspecting a scaffold will be trained by a competent person to recognize any hazards associated with the work in question.

Training should include the following areas, as applicable:

5.2.2.1 The nature of scaffold hazards;

5.2.2.2 The correct procedures for erecting, disassembling, moving, operating, repairing, inspecting and maintaining the type of scaffold in question; and

5.2.2.3 The design criteria, maximum intended load-carrying capacity and intended use of the scaffold

5.3 Retraining

5.3.1 Retraining will be conducted:

5.3.1.1 Where Brandenburg has reason to believe an employee lacks the skill or understanding needed for safe work involving the erection, use or dismantling of scaffolds

5.3.1.2 Where changes at the worksite present a hazard about which an employee has not been previously strained; or

5.3.1.3 Where changes in the types of scaffolds, fall protection, falling object protection, or other equipment present a hazard about which and employee has not been previously trained; or

5.3.1.4 Where inadequacies in an affected employee's work involving scaffolds indicate that the employee has not retained the requisite proficiency

6. Forms

6.1 Scaffold Inspection Report (SAF-26)

7. Regulatory / Permit Requirements

29 CFR 1926.450, 451, 452, 454

8. Recordkeeping

Employee training records are maintained per Employee Files, SOP and Records Retention Form, QUA-05

Title	Date	Reference	Area
Rigging	**7/23/2012**	**3.09**	**Safety**

1. Summary

This procedure provides guidance on ensuring safe rigging equipment. Rigging equipment must be inspected before each use and as necessary during its use. Inspections will be performed by qualified personnel.

2. Scope

All applicable Brandenburg personnel and work sites will be outlined within this procedure as required

3. Definitions

3.1 Basket Hitch - The sling is looped basket style below the load and acts as a cradle for the load.

3.2 Bridle Hitch – Formed when two, three or four single hitches are used together to form a bridle hitch for hoisting an object.

3.3 Choker Hitch – Formed when one eye of the slings is attached to the lifting hook, while the sling itself is drawn through the other eye. The load is placed inside the “choke” that is created while the sling is drawn tight over the load.

3.4 Competent Person - One who is capable of identifying existing and predictable hazards in the surroundings, or working conditions which are unsanitary, hazardous, or dangerous to employees, and who has authority to take prompt corrective measures to eliminate them.

3.5 Fall Zone – The area (including but not limited to the area directly beneath the load) in which it is reasonably foreseeable that partially or completely suspended materials could fall in the event of an accident.

3.6 Grab Hook - A hook designed with a special narrow throat and used to shorten or hold a length of chain. The throat engages the chain between the links for quick, non-slip handling.

3.7 Lay - The direction in which the wires and strands are orientated in a wire rope.

3.8 Point Loading - Lifting a load using the point of a hook instead of resting the sling in the saddle of the hook.

3.9 Qualified Rigger – A rigger who meets the criteria for a qualified person

3.10 Shackle – A U-shaped device used to connect two or more lifting members, capable of being secured with a threaded pin and /or clevis pin.

3.11 Shock (Impact) Loading - A sudden load placed on a lifting component as a result of a rapid change in the direction of motion or the velocity of the load.

3.12 Sling - A section of chain or cable with a master link or loop at one end and a hook or loop at the other.

3.13 Sling Hook - A chain hook with a sufficiently wide throat, to allow the chain to slide through the hook. Used with choker chain slings and where lifting eyes are provided on the load.

3.14 Spreader Beam - A structural beam generally suspended by a two legged sling that can be used to reduce horizontal compressive forces which would otherwise be transferred to the load.

3.15 Tagline - A rope (usually fiber) attached to a lifted load for purposes of controlling load spinning and pendular motions or used to stabilize a bucket or magnet during material handling operations.

3.16 Qualified Person - A person who, by possession of a recognized degree, certificate, or professional standing, or who by extensive knowledge, training and experience, successfully demonstrated the ability to solve/resolve problems relating to the subject matter, the work, or the project.

4. Responsibility

Responsibility of personnel will be outlined within this procedure as required

5. Methods

5.1 General

5.1.1 Hands or fingers shall not be placed between a sling and its load, while the sling is being tightened around the load.

5.1.2 A sling shall not be pulled from under a load when the load is resting on the sling.

5.1.3 Personnel should stand clear of suspended load. **Never** walk under an elevated load.

5.1.4 Keep hands and feet away from potential pinch points.

5.2 Safe Work Practices

5.2.1 Calculate the weight of the load to be lifted.

5.2.2 Determine the center of gravity of the load. The center of gravity is the point where the object would be perfectly balanced on a fulcrum. The load's center of gravity shall always be below the lifting points.

5.2.3 Determine the type of sling, the reach, and angle of lift for the sling selected (i.e. chain or wire rope). The reach of the sling and the angle are a function of the distance between the points of attachment. A longer reach and a larger angle of the lift will result in greater capacity. The loads on the sling legs are increased as the lift angle decreases.

5.2.4 Ensure the center of gravity of the load is directly below the crane hook. Different angles of lift result in unequal loads on individual legs of the sling.

5.2.5 For irregular loads, distribute the load among multiple sling legs to provide improved stability and equal loading among legs.

5.2.6 A spreader beam should be used on loads which cannot be supported from a single point without deforming or collapsing.

5.2.7 Defective equipment shall be immediately removed from service.

5.2.8 Rigging equipment **SHALL NOT** be loaded in excess of its recommended limit.

5.2.9 Determine the weight and balance of each load prior to lifting to make sure that the capacity of each component is not exceeded.

5.2.10 Make sure the load to be lifted is free of attachments and/or connections to stationary objects, foundations, structures or floors.

5.2.11 Use a minimum of one (1) tag line on all lifts to control the load. NOTE: **Never** wrap a tag line around a hand or any other part of the body.

5.2.12 Personnel should stand clear of suspended loads. After a load has been placed on blocking, slings and chains should be removed from under the load by hand. Slings or chains should not be removed from beneath the load by using the hoist.

5.2.13 Immediately before lifting, a final visual check should be made to ensure slings are not twisted, knotted or improperly attached to the load.

5.2.14 Prior to lifting, a lay down area should be prepared and cribbing or battens placed to absorb shock and protect the slings (choked loads).

5.2.15 If the object has sharp or abrasive edges that can damage the sling, then use a pad or softeners.

5.2.16 Avoid shock loading caused by a sudden jerking or snatching of loads, which could impose loads on the lifting components in excess of the actual weight of the object to be lifted.

5.2.17 Make sure all rigging hooks are turned out before hoisting. If a slack condition occurs the load hooks will not become dislodged.

5.2.18 Raise the load to clear all objects in the load's intended path of travel.

5.2.19 **Never** work under a suspended load unless the load has been supported by cribbing or other means.

5.2.20 **Never** leave a load suspended when the hoist or crane is unattended.

5.2.21 **Never** attempt to repair or adjust a sling or its components once a lift has been initiated. Repairs or modifications to the rigging should be performed while load is on the ground.

5.2.22 **Never** shorten a chain sling by twisting, knotting, or bolting. Slings should only be shortened or adjusted by methods approved by the manufacturer.

5.2.23 **Never** point load a hook unless it is specifically designed and rated for that use.

5.2.24 **Never** permit personnel to ride lifting hooks or loads.

5.3 Storage

5.3.1 When not in use, all slings should be properly stored in a cool, dry place.

5.3.2 Do not store slings in areas where they could be exposed to moisture, extreme temperature, corrosion, mechanical damage or kinking.

5.3.3 All rigging equipment that is not in use shall be removed from the immediate work area so it does not prevent a hazard to employees.

5.4 Inspections

5.4.1 Routine field inspections of a sling and its components will be conducted prior to each use by a competent person.

5.4.2 A thorough periodic inspection shall be made on alloy steel chains on a regular basis. These inspections shall be conducted at least every twelve (12) months and performed by a competent person.

5.4.2.1 Records of these annual inspections shall be kept and maintained by the Equipment Division.

5.4.2.2 An inspection record may be completed on the Rigging Inspection Report (SAF-27) in lieu of third party notification forms.

5.4.3 Welded alloy steel chain slings shall have permanently affixed, durable identification stating size, grade, rated capacity and sling manufacturer.

5.4.4 Wire rope slings shall have permanently affixed, legible identification markings stating size, rated capacity for the type(s) of hitch(es) used and the angle upon which it is based, and the number of legs if more than one.

5.4.5 The inspection will look for the following signs of damage or defect:

5.4.5.1 For Alloy Steel Chains check for:

5.4.5.1.1 Missing identification tags,

5.4.5.1.2 Cracked or deformed master links, coupling links, or other components,

5.4.5.1.3 Cracked hooks, or hooks that have been opened more than 15% of the normal throat opening measured at the narrowest point or twisted more than 10^0 from the plane of the unbent hook.

5.4.5.1.4 Stretched chain links or components

5.4.5.1.5 Bent, twisted or deformed chain links or components

5.4.5.1.6 Excessive pitting or corrosion

5.4.5.1.7 Lack of the chain or component’s ability to hinge freely,

5.4.5.1.8 Weld splatter,

5.4.5.1.9 Any other condition, including visible damage, that causes doubt as to the continued use of the chain.

5.4.5.2 For Wire Rope check for:

5.4.5.2.1 Kinking, crushing, birdcaging, unstranding, core protrusion, distorted rope structure or any other damage that causes distortion of the wire rope structure

5.4.5.2.2 Wear or scraping of one-third the original, diameter of outside individual wires,

5.4.5.2.3 Evidence of heat damage,

5.4.5.2.4 End attachments that are cracked, deformed or worn.

5.4.5.2.5 Hooks that have been opened more than 15% of the normal throat opening measured at the narrowest point or twisted more than 10^0 from the plane of the unbent hook.

5.4.5.2.6 Corrosion of the rope or end attachments

5.4.5.2.7 10 randomly distributed broken wires in one rope lay, or five broken wires in one strand on one rope lay

5.4.5.2.8 Missing or illegible sling identification

5.4.5.2.9 NOTE: all defective rope must be removed from service immediately.

5.4.5.3 For Synthetic Web and Slings check for:

5.4.5.3.1 Melting or charring of any part of the sling surface

5.4.5.3.2 Acid or caustic burns

5.4.5.3.3 Snags, punctures, tears or cuts,

5.4.5.3.4 Broken or worn stitching,

5.4.5.3.5 Distortion of fittings,

5.4.5.3.6 Knots in any part of the sling,

5.4.5.3.7 Missing or illegible identification tags,

5.4.5.3.8 Name or trademark of manufacturer

5.4.5.3.9 Any other condition, including visible damage, that causes doubt as to the continued use of the sling.

5.4.5.4 For Shackles check for:

5.4.5.4.1 Missing or unreadable ID

5.4.5.4.2 Heat damage

5.4.5.4.3 Pitting or corrosion

5.4.5.4.4 Bent, twisted, distorted stretched, cracked or broken components

5.4.5.4.5 Nicks or gouges

5.4.5.4.6 Thread damage

5.4.5.4.7 Evidence of welding

5.4.5.4.8 Any other conditions, including visual damage, that causes doubt as to the continued use of the shackle.

5.4.5.5 For Sling / Grab hooks check for:

5.4.5.5.1 Inspect hooks. Hooks opened more than 15% of the normal throat opening or twisted more than 10^0 from the plane of unbent hook, shall be placed out of service.

5.4.5.5.2 Corrosion or rust,

5.4.5.5.3 Abrasion,

5.4.5.5.4 Evidence of heat damage,

5.4.5.5.5 Nicks or gouges,

5.4.5.5.6 NOTE: all defective hooks must be tagged out.

6. Forms

6.1 Rigging Inspection Report (SAF-27)

7. Regulatory / Permit Requirements

29 CFR 1926.1400

29 CFR 1926.251

8. Recordkeeping

Annual inspection forms shall be maintained by the Maintenance Department and per Employee Files, SOP and Records Retention Form, QUA-05.

Title	Date	Reference	Area
Tank Removal	**12/05/2013**	**3.10**	**Safety**

1. Summary

Brandenburg removes both above and underground tanks in a safe and environmentally sound manner. Also, tanks are removed in a manner that mitigates environmental hazards. This is a general procedure for the removal / abandonment of underground tanks. State and local rules will be reviewed and adhered to for all tank work.

2. Scope

All applicable Brandenburg personnel and work sites will be outlined within this procedure as required

3. Definitions

3.1 Aboveground Storage Tank (AST) – Any tank not considered a UST.

3.2 Freedom of Information Act (FOIA) - A search of available public information pertaining to tanks (and other subjects)

3.3 Inerting - The displacement of oxygen from a tank to deprive a potential fire from a source of oxygen.

3.4 Underground Storage Tank (UST) - Any tank, including underground piping connected to the tank, that has at least 10% of its volume underground.

3.5 Purging – The removal of flammable vapors from a tank so as to deprive a potential fire of any source of fuel.

4. Responsibility

Responsibility of personnel will be outlined within this procedure as required

5. Methods

5.1 General

State, County and local governments typically have specific rules pertinent to underground storage tank removals/abandonment. Personnel removing tanks must be aware of the specific rules and regulations pertinent to tank removals in a particular location.

5.2 Hazard Assessment / Preparation

5.2.1 When required by State regulations, submit a FOIA request and obtain as much information from the customer as you can pertinent to the tank. The following information pertinent to the tank will be reviewed:

5.2.1.1 Date of installation

5.2.1.2 Location

5.2.1.3 Underground utilities

5.2.1.4 Manufacturer/installer information, including specifications

5.2.1.5 Availability of as-built diagrams, blueprints, architectural plans or other diagrams

5.2.1.6 Safety data sheets (SDS)

5.2.1.7 History of usage, including materials contained

5.2.1.8 Modifications – piping systems

5.2.1.9 Monitoring systems

5.2.1.10 Current status

5.2.1.11 Recent analytical information, test results

5.2.1.12 Pictures

5.2.2 Request a tank ID number (registration number) from the Office of the State Fire Marshal. NOTE: If the tank was installed prior to 1974 it may not have a registration number. NOTE: For pre-1974 tanks you may be required to:

5.2.2.1 Register the tank, and request a number,

5.2.2.2 Obtain a new certificate stating that the tank is pre-1974,

5.2.2.3 Or follow site specific instructions from the State Fire Marshal.

No matter which procedure is followed, you must ALWAYS get a permit to remove the tank.

5.2.3 After reviewing the information above, contact the appropriate regulatory agency, obtain a Tank Removal Permit and schedule a removal date.

5.2.4 A hazard assessment will take place prior to the inception of underground storage tank work. This hazard assessment may be documented in the Engineering Survey, safety survey, Health and Safety Plan (HASP), or in the form of a Task Safety Analysis (TSA).

5.3 Orientation of Workers

All Brandenburg employees will attend a Brandenburg Site Orientation prior to starting work. Brandenburg's orientation shall include an introduction of the work scope, tank removal means and methods, a review of the contents of the site-specific HASP, Safety Data Sheets (SDS), emergency and evacuation procedures.

5.4 Training of Workers

Only those workers who have been specifically licensed by the state will be authorized to supervise tank removals. All individuals working on-site in the exclusion zone must have current training as per applicable state and federal regulations. Other specific training requirements may be outlined in the site-specific HASP.

5.5 Demarcation

Prior to on-site activities, a work area of sufficient size will be marked off to restrict access and control sources of ignition. Specific information as to dimensions of a work area will be listed in the site-specific HASP.

5.6 Air Monitoring

At a minimum, the tank atmosphere and the excavation area will be regularly tested for flammable vapor concentrations and oxygen content until the tank is removed from the excavation, and the site or the tank has been properly filled. When testing tank vapor space, ensure readings are taken at the bottom, middle, and upper portions of the tank.

5.7 Cleaning

Prior to removal or abandonment, all liquids and sludge will be removed from the tank and all connecting lines. All product piping will be drained into the tank, being careful to avoid spillage into the excavation area. Product piping must be disconnected from the tank. Other piping must be capped or removed. NOTE: Vacuum trucks must be upwind and grounded while pumping.

5.8 Purging / Inerting

Purge the tank of flammable vapors or inert the tank. Purging may be done by ventilation using an eductor type air mover or a diffused air blower. Ensure the equipment is properly bonded or grounded prior to ventilation. The ventilation of all vapors will be conducted so as to comply with state and federal regulations. Inerting may be accomplished by several methods. A common method is the use of dry ice. Another common method for inerting involves the use of a nitrogen blanket. State and local regulators have requirements/restrictions on which methods are acceptable in their domain.

After purging / inerting the tank by the acceptable method, monitor the tank for flammable vapors with a combustible gas indicator until the atmosphere in the tank has been brought to less than 10% of the lower explosion limit (LEL). If dry ice is used, the oxygen content must also be monitored.

5.9 Abandonment

After cleaning, disconnect the suction, inlet, gauge, and vent lines. If the openings at the top of the tank are not adequate for the introduction of the inerting agent, or removal of the tank may cause structural damage to an adjacent building or under other circumstances, the tank may be abandoned in place as per the permit. For abandoning in place, the tank can be filled completely with an inert solid material such as sand, pea gravel or concrete. After filling the tank, the vent line must be disconnected and the cap removed.

5.10 Removal

Purge the tank of all flammable vapors. Excavate to the top of tank. Remove the drop tube, fill pipe, gauge pipe, vapor recovery connection, submersible pumps, and any other tank fixtures. Cap or remove all non-product lines except for the vent lines. The vent lines will remain connected until the tank is purged. Temporarily plug all lines except the vent lines. Remove the tank from the excavation and place it on a level surface. Use wood blocks to prevent movement of the tank after removal and prior to loading on a truck for transportation. Prior to loading, render the tank non-usable by cutting or otherwise compromising the integrity of the tank. Recheck that the tank is free of vapors and grounded prior to cutting.

5.11 Soil Removal/Confirmatory Sampling

Any contaminated soil discovered during tank removal will be disposed of in accordance with federal, state or local regulations. The amount of soil removed and the extent of soil contamination may vary with each tank removal. Due to this variation, the amount of soil to be removed will be determined on a site specific basis.

5.12 Entrance into a tank shall only be accomplished after complying with Brandenburg's Confined Space procedures (SOP 3.01).

5.13 Disposal

All tanks will be disposed of in accordance with applicable federal, state, and local requirements. Typically, all steel tanks will be managed as scrap to a recycling facility. Prior to management off site, the tank will be rendered unusable. A Certificate of Destruction / Disposal (ENV-5 UST / ENV-6 AST) will be completed, and placed in the project file to confirm destruction of the tank. Pictures of the tank after removal should be taken and placed in the file. The tank should be rendered unusable by torch cut, cold cut, or by puncturing in a safe manner. Whenever feasible, the tank will be shipped on the day it was removed from the excavation.

6. Forms

6.1 Tank Registration Form (federal or state provided).

6.2 Permit to remove/abandon tank (State or local provided).

6.3 Confined Space Monitoring log (if applicable).

6.4 Notification Form for Underground Storage Tanks (state or local specific).
NOTE: Form requires updating after removal.

6.5 Certificate of UST Destruction / Disposal (ENV-08A)

6.6 Certificate of AST Destruction / Disposal (ENV-08B)

7. Regulatory / Permit Requirements

Prior to removal or abandonment in place, the tank may need to be registered. Prior to work, city, county, state, or federal regulations may require issuance of a permit to conduct the activity. Typically, there is a minimum time required prior to activities (i.e. 30 days).

8. Record Keeping

All information pertinent to tank activities will be maintained in the project file for a minimum of three years; for thirty years if on a CERCLA site.

Title	Date	Reference	Area
Hand Tools	**7/23/2012**	**3.11**	**Safety**

1. Summary

Brandenburg workers are qualified and trained on the proper use of hand tools. All hand tools must be inspected, maintained, stored and used in accordance with manufacturer's recommendations.

2. Scope

All applicable Brandenburg personnel and work sites will be outlined within this procedure as required

3. Definitions

None

4. Responsibility

Responsibility of personnel will be outlined within this procedure as required

5. Methods

5.1 Training / Qualifications

5.1.1 All workers who use hand and power tools will be trained in hand and power tool safety.

5.1.2 Training will be performed by the Supervisor, an Environmental Health & Safety (EHS) Manager, or other qualified person.

5.1.3 The training may be performed in the field (hands-on) or in a classroom setting.

5.2 Tool Use

5.2.1 Tools will be used in accordance with manufacturer's recommendations.

5.2.2 Tools will be used only for the purpose for which they were designed.

5.2.3 Makeshift devices will not be used.

5.2.4 Damaged tools will not be used.

5.2.5 Electric power-operated tools shall be either double-insulated type or grounded.

5.2.6 Pneumatic power tools shall be secured to the hose by positive means to prevent the tool from becoming accidentally disconnected.

5.2.7 Safety clips or retainers shall be securely installed and maintained on pneumatic tools to prevent hoses or attachments from being accidentally expelled.

5.2.8 All fuel powered tools shall be stopped while being refueled, serviced or maintained.

5.3 Inspection

5.3.1 Prior to use, employees will inspect each hand tool to ensure that the tool is in safe condition.

5.3.2 Tools with mushroomed heads, loose, split or broken handles, spread jaws, defective cords, ground wires and plugs, or otherwise not in appropriate working condition will not be used.

5.4 Maintenance

5.4.1 If a worker finds that a hand tool is not in proper working order, he will not use that tool, but instead will remove the hand tool from service and notify the Supervisor. The Supervisor will either dispose of the tool or make arrangements for repair. Hand tools determined to be defective will not be used.

5.5 Storage

5.5.1 Tools will be stored in accordance with manufacturer recommendations

5.6 The effectiveness of the hand tool program will be monitored by the Health & Safety Division and documented during routine safety inspections.

5.7 Personal Protective Equipment

5.7.1 Employees using hand and power tools shall be provided with adequate personal protective equipment necessary to protect them from the tool's particular hazards.

6. Forms

None

7. Regulatory / Permit Requirements

29 CFR 1926.300 - 303

8. Record Keeping

Employee training records are maintained per Employee Files, SOP and Records Retention Form, QUA-05.

Title	Date	Reference	Area
Vehicle Safety	**7/23/2012**	**3.12**	**Safety**

1. Summary

Brandenburg personnel use a variety of company vehicles. Operators of these vehicles are required to maintain and operate the vehicle in accordance with manufacturer's recommendations and standard business practices.

2. Scope

All applicable Brandenburg personnel and work sites will be outlined within this procedure as required

3. Definitions

None

4. Responsibility

Responsibility of personnel will be outlined within this procedure as required

5. Methods

5.1 While operating any company vehicle, employees are required to have in their possession a valid motor vehicle operator's license issued by the state in which they reside. Employees will have a valid vehicle insurance card in the vehicle.

5.2 An employee who has received a change in status of their driver's license which involves suspension or revocation, must report this change of status to their Supervisor immediately.

5.3 All drivers of company vehicles are required to operate the vehicle in accordance with manufacturer's recommendations for use and company policy, and obey all applicable traffic rules, signs, and signals.

5.4 Operation of a company vehicle under the influence of drugs and / or alcohol is prohibited and will result in disciplinary action up to and including termination.

5.5 All mechanical problems must be reported to the Supervisor immediately, and (if not an imminent danger situation) repaired as soon as possible. NOTE: if the mechanical problem is an imminent danger, the vehicle must not be driven -- call for a tow.

5.6 The company vehicle should be checked on a daily basis to ensure that it is in good working order

5.7 Accident

Should an accident occur, the driver of the company vehicle must:

5.7.1 Report the accident promptly in accordance with Accident / Incident Reporting & Investigation SOP (1.18)

5.7.2 Complete a Motor Vehicle Accident Claim.

5.7.3 Exchange information with any other vehicles that are involved.

5.7.4 Obtain pertinent information from any witnesses.

5.7.5 Take pictures of all vehicles, property damage, and conditions that affected the accident.

5.7.6 Obtain a police report.

6. Forms

6.1 Motor Vehicle Accident Claim

7. Regulatory / Permit Requirements

None

8. Record Keeping

Claim Reports are maintained per Claim Form Use, SOP.

Title	Date	Reference	Area
Traffic Control	**7/23/2012**	**3.13**	**Safety**

1. Summary

The work on Brandenburg sites can, on occasion, affect traffic flow and patterns. This procedure has been developed to prevent incidents involving Brandenburg personnel and the general public that may be affected when Brandenburg work affects traffic flow.

2. Scope

All applicable Brandenburg personnel and work sites will be outlined within this procedure as required

3. Definitions

None

4. Responsibility

Responsibility of personnel will be outlined within this procedure as required

5. Methods

Class 2 or Class 3 reflective vests are required for personnel who are expected to work near vehicular traffic.

The class will be determined by the ANSI/ISEA 107-2004 publication *American National Standard for High-Visibility Safety Apparel and Headwear*.

5.1 Brandenburg shall comply with the latest edition of the U.S. Department of Transportation's Manual on Uniform Traffic Control Devices (MUTCD) for Streets and Highways, 23 CFR 630 Subparts J and K, and all applicable federal, state and local regulations.

5.2 In addition to personal protective equipment, various forms of traffic control devices may be implemented to assist in the demarcation of work zones and establishment of safe corridors for vehicular and pedestrian traffic. These controls include: barricades; cones and / or caution tape; signs; signals; markings; canopies; curtains; temporary walls/curbing; and fencing. Posted speed limits shall be adhered to. All state Department of Transportation requirements for lane closures will be adhered to.

5.3 All work conducted on public roadways will be coordinated with appropriate city and state departments responsible for safety and the coordination of lane closures, traffic rerouting, street closures etc….

5.4 Pre-job planning, including a Task Safety Analysis (TSA) (SAF-50), shall be conducted prior to the start of work to determine appropriate needs regarding:

5.4.1 Safety issues and controls (see ANSI / ASSE A10.33 and A10.38)

5.4.2 Materials

5.4.3 Equipment

5.4.4 Staffing requirements

5.4.5 Traffic Control Plans

5.4.6 Internal Traffic Control Plans

6. Forms

6.1 Task Safety Analysis (SAF-50)

7. Regulatory / Permit Requirements

7.1 29 CFR 1926.200 (g)(2)

7.2 ANSI / ISEA 107-2004, American National Standard for High-Visibility Safety Apparel and Headwear

7.3 US DOT's Manual on Uniform Traffic Control Devices (MUTCD), current edition

7.4 23 CFR 630 Subparts J and K

7.5 ANSI / ASSE A10.47-2009, Work Zone Safety for Highway Construction

8. Recordkeeping

None

Title	Date	Reference	Area
Line Breaking	**7/23/2012**	**3.14**	**Safety**

1. Summary

Brandenburg takes every reasonable precaution to ensure that a product line is “empty” and depressurized before making a line break or disturbing the line. This procedure has been developed to protect people property, and the environment while performing first line breaks.

2. Scope

All applicable Brandenburg personnel and work sites will be outlined within this procedure as required

3. Definitions:

3.1 Line Breaking - The opening or separation of fixed or flexible piping, hoses, process equipment, pumps, etc. used to convey materials that may be:

3.1.1 Under pressure,

3.1.2 Toxic,

3.1.3 Elevated in temperature,

3.1.4 Flammable or corrosive,

3.1.5 Reactive with air or moisture, or;

3.1.6 Otherwise present a hazard to people, environment, or property.

4. Responsibility

Responsibility of personnel will be outlined within this procedure as required

5. Methods

5.1 General

5.1.1 All work will be performed under the supervision of a competent person.

5.1.2 All workers performing work activities related to the line break will be instructed on the potential hazards and associated control measures to be implemented.

5.1.3 A hazard assessment will take place prior to the inception of line breaking activities. This hazard assessment may be documented in the Engineering Survey, safety survey, site-specific Health and Safety Plan (HASP), or in the form of Task Safety Analysis (TSA).

5.2 Permit System

A permit specifically designed to address hazards associated with first line breaks may be completed prior to line breaking activities as required by the customer, hazard assessment, and/or the Supervisor.

5.3 Isolate the System

The portion of the line being worked on will be isolated from adjacent systems in the most effective way. This might include closing of valves, rerouting product flow, or other effective means. The Hazardous Energy Control (Lock-Out / Tag-Out) procedure will be used as necessary (SOP 3.02).

5.4 Empty the Line

Lines shall be drained completely by means of drain cocks, sampling ports and other existing fittings and orifices, making certain that the valves are left open to prevent the possibility of an air lock.

5.5 Purge the System

Low pressure steam or inert gas such as nitrogen can sometimes be applied to piping systems to aid in product removal.

5.6 Remove energy sources such as steam or electrical heat tracing, and ensure that the energy level of any material inside of the piping system has been minimized.

5.7 Fill out the Permit

Complete a Line Break Permit (SAF-28) when required, as outlined in section 5.2 above.

5.8 Prepare the General Area

Prior to any line breaking, the area shall be prepared for maximum protection to personnel and environment.

5.9 Prepare the Break Area

5.9.1 If a flange is to be broken, the nuts and bolts or connectors securing the flange, and the adjacent area must be cleaned prior to removal.

5.9.2 If a pipe is to be pierced, the area adjacent to the point of entry must be cleaned prior to piercing.

5.9.3 If a shield is to be used, the competent person will ensure proper placement of the shield.

5.9.4 Clear an escape path so that egress can be quick and direct in case of emergency.

5.9.5 Limit the number of participants to only those persons necessary to adequately perform the job.

5.9.6 Ensure that conditions are suitable for the intended work such as adequate lighting, running water, hoses, escape packs, air monitoring, etc.

5.10 The Line Break

NOTE: Breaking of a line is considered breaking into a closed system. Regardless of the precautions taken, it must be assumed that, at the point where the line is to be broken, there still may be some condition (i.e. material in the line, air lock, pressure, etc.) that can potentially cause injury.

The steps below are the minimum requirements which must be followed in line breaking activities where a customer-specific policy does not exist:

5.10.1 A competent person must be on the job site, in the immediate line break area when a line is broken.

5.10.2 Each employee must be shown the location of the nearest exit, safety shower and eyewash station prior to starting work.

5.10.3 Stand to the side and/or use shielding whenever possible, including the partial use of flange covers.

5.10.4 Place a drain pan or other device in an area likely to catch any material left in the line that may be spilled. Be cautious not to place the drain pan in an area that could impede work.

5.10.5 Loosen bolts on the flange which are farthest (lower and opposite side) from the worker doing the line breaking.

6. Forms

6.1 Line Break Permit (SAF-28)

7. Regulatory / Permit Requirements

None

8. Record Keeping

All Line Break Permits will be retained in the project file and per Records Retention Form, QUA-05.

Title	Date	Reference	Area
Contamination Control	**7/23/2012**	**3.15**	**Safety**

1. Summary

While in the performance of a project, materials considered contaminated may be handled. Contaminated or hazardous materials are controlled to minimize the spread of contamination on site and during transfer off site.

2. Scope

All applicable Brandenburg personnel and work sites will be outlined within this procedure as required

3. Definitions

3.1 Contamination – The spread of a chemical constituent (pollutant) to an area that has previously been chemical free.

3.2 Exclusion Zone - The innermost of three zones where contamination of personnel and equipment can occur.

3.3 Contamination Reduction Zone - The transition area separating the contaminated area (Exclusion Zone) from the clean area (Support Zone). The Contamination Reduction Zone is designed to reduce the probability that the Support Zone will be affected by contamination or other site hazards.

3.4 Support Zone - The non-contaminated outermost zone of the site. This zone contains needed support equipment and administrative functions.

4. Responsibility

Responsibility of personnel will be outlined within this procedure as required

5. Methods

5.1 Hazard Assessment

Brandenburg considers work site contamination to be a potential health and safety hazard. In order to determine the effect of contamination on personnel, equipment or the environment, Brandenburg performs a hazard assessment. This hazard assessment may be documented in the Engineering Survey, safety survey, site-specific Health and Safety Plan (HASP), or in the form of Task Safety Analysis (TSA).

5.2 Hazard Control

In order to effectively control hazards, Brandenburg implements a hierarchy of controls; in priority order these are engineering controls, administrative controls, and personal protective equipment.

5.2.1 Engineering Controls

Engineering controls are used to control contamination as often as feasible. Examples of the use of engineering controls to control contamination include but are not limited to:

5.2.1.1 The erection of containment structures in conjunction with negative air machines.

5.2.1.2 Substituting a less hazardous material, equipment, or process for a more hazardous one (e.g., using soap & water in place of solvents, use of automated instead of manually operated equipment).

5.2.1.3 Source modification through changing a hazard source to make it less hazardous (e.g., wetting dust particles).

5.2.1.4 Isolation through separating employees from hazardous operations, processes, equipment, or environments (e.g., placing barriers between employees and hazardous operations).

5.2.1.5 The use of general exhaust (dilution of air contaminants) and local exhaust (removal of air contaminants at the source) ventilation systems.

5.2.2 Administrative Controls

Administrative controls, other measures aimed at reducing employee exposure to hazards, are often effectively used in conjunction with, or in addition to, engineering controls. Examples of administrative controls include but are not limited to:

5.2.2.1 The use of work zones such as exclusion zone, contamination reduction zone (including decontamination procedures), and support zone.

5.2.2.2 Reduction of exposure times through employee job rotation.

5.2.2.3 Air sampling and medical surveillance.

5.2.2.4 Housekeeping

5.2.2.5 Training and education of employees (e.g., exposure-reducing safe work practices, good personal hygiene)

5.2.3 Personal Protective Equipment (PPE)

5.2.3.1 Part of the third tier of controls, PPE is often used to provide employee exposure protection as a supplement to engineering and administrative controls already in-place.

5.2.3.2 The use of PPE to reduce employee exposure to hazards is required when engineering and administrative controls are not feasible or effective in reducing these exposures to acceptable levels.

5.2.3.3 In regards to air contaminants, administrative or engineering controls must first be determined and implemented whenever feasible. When such controls are not feasible to achieve full compliance, protective equipment or any other protective measures shall be used to keep the exposure of employees to air contaminants within the allowable limits as required in 29 CFR 1926.55.

5.3 Minimization/Control of Contamination

5.3.1 All workers are required to perform work activities to minimize contact with hazardous substances or with equipment that has been in contact with hazardous substances by following the hazard control strategies developed for their work.

5.3.2 When required by the HASP, work zones such as exclusion, contamination reduction and support zones will be delineated.

5.3.3 Personnel, equipment, or vehicles will be decontaminated in accordance with established site-specific decontamination procedures.

5.3.4 Procedures as specified in the HASP for disposal of clothing, equipment, or decontamination wastes will be adhered to.

5.3.5 Hygiene facilities, change areas, & eating facilities will be used as required dependent on exposure and direct contact with hazardous materials.

5.3.6 Contaminated uniforms or other company supplied clothing will not be worn or laundered at home.

6. Forms

None

7. Regulatory / Permit Requirements

29 CFR 1910.120

29 CFR 1926.55

29 CFR 1926.65

8. Recordkeeping

None

Title	Date	Reference	Area
Hazardous Waste Operations	**7/23/2012**	**3.16**	**Safety**

1. Summary

Brandenburg has developed a safety and health program to protect workers who are involved in hazardous waste operations and activities.

2. Scope

All applicable Brandenburg personnel and work sites will be outlined within this procedure as required

3. Definitions

3.1 Hazardous Waste means:

3.1.1 A waste or combination of wastes as defined in 40 CFR 261.3, or

3.1.2 Those substances defined as hazardous wastes in 49 CFR 171.8

3.2 Hazardous Substance - Any substance designated or listed under (A) through (D) of this definition, exposure to which results or may result in adverse affects on the health or safety of employees:

(A) Any substance defined under section 101(14) of CERCLA;

(B) Any biological agent and other disease-causing agent which after release into the environment and upon exposure, ingestion, inhalation, or assimilation into any person, either directly from the environment or indirectly by ingestion through food chains, will or may reasonably be anticipated to cause death, disease, behavioral abnormalities, cancer, genetic mutation, physiological malfunctions (including malfunctions in reproduction) or physical deformations in such persons or their offspring;

(C) Any substance listed by the U.S. Department of Transportation as hazardous materials under 49 CFR 172.101 and appendices; and

(D) Hazardous waste as defined above.

3.3 Hazardous Waste Operation - Any operation conducted within the scope of this policy.

4. Responsibility

Responsibility of personnel will be outlined within this procedure as required

5. Methods

5.1 General Assessment

Hazardous waste work is typically assessed and well defined prior to site work activity. Brandenburg will reassess pertinent information and include findings in the Engineering Survey. Hazard controls are included in the Engineering Survey and in the site-specific Health and Safety Plan (HASP). However, should Brandenburg have an unplanned encounter with materials that are considered hazardous waste, the project will be reassessed to assure compliance with hazardous waste standards and all/any other applicable standards.

5.2 Safety and Health Program - General

5.2.1 For hazardous waste activities, Brandenburg will develop a written safety and health program that includes the following components

5.2.1.1 An organizational structure,

5.2.1.2 A comprehensive workplan,

5.2.1.3 A HASP,

5.2.1.4 A training program,

5.2.1.5 A medical surveillance program,

5.2.1.6 Standard Operating Procedures for health and safety,

5.2.1.7 Any necessary interface between general program and site specific activities.

5.2.2 Organizational Structure/Responsibilities

The organizational structure part of the program shall establish the specific chain of command and specify the overall responsibilities of supervisors and employees. It shall include, at a minimum, the following elements:

5.2.2.1 A General Supervisor who has the responsibility and authority to direct all hazardous waste operations.

5.2.2.2 A Site Safety and Health Supervisor who has the responsibility and authority to develop and implement the site safety and health plan and verify compliance

5.2.2.3 All other personnel needed for hazardous waste site operations and emergency response and their general functions and responsibilities.

5.2.2.4 The lines of authority, responsibility, and communication.

5.2.3 Comprehensive Workplan

The comprehensive workplan addresses the tasks and objectives of the work. It will include logistics and resources required to complete those tasks and objectives. The comprehensive workplan shall address the following subjects:

5.2.3.1 Anticipated clean-up activities

5.2.3.2 Personnel requirements

5.2.3.3 Implementation of training

5.2.3.4 Informational programs

5.2.3.5 Implementation of medical surveillance program

5.2.4 Site-Specific Health and Safety Plan (HASP)

The HASP, which must be kept on-site, will address the safety and health hazards of each phase of site operations and will include the requirements and procedures for employee protection. The site-specific HASP will address the following subjects:

5.2.4.1 Hazard assessment for each site task and operation found in the work plan

5.2.4.2 Training assignments

5.2.4.3 Personal protective equipment (PPE)

5.2.4.4 Medical surveillance requirements

5.2.4.5 Monitoring requirements (air and personnel) and environmental sampling techniques and instrumentation to be used

5.2.4.6 Site control measures

5.2.4.7 Decontamination procedures

5.2.4.8 Emergency response plans

5.2.4.9 Confined space entry procedures

5.2.4.10 Spill containment

5.2.4.11 Pre-entry briefings

5.2.4.12 Plan effectiveness

5.2.5 Training

General Training

5.2.5.1 All workers will have successfully completed 40 hours of instruction off site, and a minimum of three days actual field experience under the direct supervision of a trained, experienced Supervisor.

5.2.5.2 Supervisors directing hazardous waste operations will have successfully completed the initial worker training along with an additional eight (8) hours of specialized training.

5.2.5.3 General hazard communication training will have been completed by all site workers prior to the inception of site work.

Specific Training

5.2.5.4 Besides basic training mentioned above, all workers and Supervisors will be adequately trained for site specific hazards that they may come in contact with before site entry.

5.2.5.5 A safety meeting will take place at least daily.

5.2.6 Personal Protection

5.2.6.1 Engineering controls, work practices, personal protective equipment (PPE), or a combination of these shall be implemented and used to protect the workers from safety and health hazards.

5.2.6.2 Whenever engineering controls and work practices are not feasible or not required, any reasonable combination of engineering controls, work practices and PPE shall be used to reduce and maintain employee exposures.

PPE shall be selected and used which will protect employees from the hazards and potential hazards they are likely to encounter as identified during the site characterization and analysis. The level of protection may be increased or decreased when additional information on site conditions is identified.

5.2.7 Medical Surveillance

All medical surveillance will be conducted in accordance with SOP 1.12 (Medical Surveillance). Should the need arise for additional or site-specific monitoring, that requirement will be included in the HASP.

5.3 Decontamination

5.3.1 A decontamination procedure shall be developed, communicated to employees and implemented before any employees or equipment may enter areas on-site where potential for exposure to hazardous substances exist.

5.3.2 All employees leaving a contaminated area shall be appropriately decontaminated; all contaminated clothing and equipment leaving a contaminated area shall be properly disposed of or decontaminated.

5.4 Disposal of Waste

5.4.1 All wastes will be disposed of in accordance with applicable local, state and federal regulations.

5.5 Storage/Labeling of Containers

5.5.1 All materials will be stored and labeled in accordance with applicable local, state and federal regulations.

6. Forms

None

7. Regulatory / Permit Requirements

29 CRF 1926.65

29 CFR 1910.120

8. Recordkeeping

Employee training records are maintained per Employee Files, SOP and Records Retention Form, QUA-05.Training records are also maintained on-site during hazardous waste operations.

Title	Date	Reference	Area
Hot Work	**7/23/2012**	**3.17**	**Safety**

1. Summary

Brandenburg uses cutting torches and flame or spark producing devices during normal business activity. This hot work procedure has been developed to ensure against losses from fires/explosions or related incidents.

2. Scope

All applicable Brandenburg personnel and work sites will be outlined within this procedure as required

3. Definitions

3.1 Hot Work - Any activity, such as welding, grinding, torch cutting or brazing, which can potentially produce a spark or act as an ignition source, involves a hot surface or heating of a surface, or involves an open flame which could ignite flammable or combustible materials within the work area.

4. Responsibility

Responsibility of personnel will be outlined within this procedure as required

5. Methods

5.1 Hazard Assessment

Prior to the inception of hot work, a hazard assessment will be completed. This hazard assessment may be in the form of a safety survey, daily safety meeting, site-specific Health and Safety Plan (HASP), Task Safety Analysis (TSA), or similar.

5.2 Training

All employees involved in hot work will be trained to acquire the understanding, knowledge and skills necessary for the safe performance of the duties assigned to them.

5.3 Hot Work Permit Issuance

A Hot Work Permit (SAF-29) may be required for any welding, cutting, or other flame-producing activity as outlined in the site-specific HASP, customer requirements, local fire departments, or other governing institution. The permit will be issued by the Supervisor, posted in the work area, and be available for review by the Brandenburg's Environmental Health & Safety (EHS) Manager, customer representative, or other third party as requested.

5.4 Precautions

Prior to hot work the following precautions must be adhered to:

5.4.1 All flammable material or liquid will be removed or protected.

5.4.2 A fire watch will be assigned as required (e.g.- areas not designated as safe hot work areas) by a HASP and / or customer policy.

5.4.3 Combustibles will be removed or protected from sparks and slag. Sparks and slag will be contained with welding cloth or other type of non-combustible barrier, when necessary.

5.4.4 Proper barriers or screens will be erected to protect others from the welding arc to prevent flash burns.

5.4.5 A twenty (20) pound or larger dry chemical fire extinguisher, or a charged water hose must be within 20 feet of any welding, burning, or flame work.

5.4.6 A twenty (20) pound or larger dry chemical fire extinguisher is to be with each burning cart

5.4.7 Keep hoses and welding leads out of walkways. Inspect all leads, grounds, clamps, welding machines, hoses, gauges, torches and cylinders before each days use.

5.4.8 No welding or burning is to be done on a closed vessel or tank, or any vessel or tank that has not been adequately drained and/or decontaminated.

5.5 Protective Clothing

Protective clothing required for welding and burning varies with the size, nature and location of the work to be performed. Consult the site-specific HASP for details on required PPE. The following are general rules for PPE during hot work activities:

5.5.1 Only Fire Resistant Clothing (FRC), full length arms and legs, will be worn. NOTE: There should be no holes in clothing. The clothing might include leggings, chaps, shrouds, gauntlet gloves, etc.

5.5.2 All welders should use flame-proof and/or heat-resistant gloves.

5.5.3 Clothes should be free from oil and grease.

5.5.4 Leather or other suitable flame-proof and/or heat-resistant material should be considered if long-term exposure to radiant heat or sparks is anticipated.

5.5.5 Eye and face protection per SOP 2.02 (Personal Protective Equipment).

5.6 Welding (Electric)

When performing welding, the following general precautions must be adhered to:

5.6.1 All work must have an adequate ground.

5.6.2 Do not leave a rod in the electrode holder when you lay it down. Put stub ends in proper container--not on the floor.

5.6.3 All arcs should be shielded in all work areas.

5.6.4 All machines must be turned off at the end of the shift.

5.6.5 An approved welding helmet must be worn.

5.6.6 Never perform electric welding from a metal ladder.

5.7 Burning (Gas)

When performing burning, the following general precautions must be adhered to:

5.7.1 Before connecting regulators to cylinders, carefully open the cylinder valve slightly to blow out any foreign particles (this is known as “cracking”). After the regulator is connected, stand to one side of gauge while the cylinder valve is opened. Open the cylinder valve slowly. Be certain that the second stage of the regulator is closed before opening the cylinder valve.

5.7.2 Open valves on fuel gas cylinders (propane, acetylene, natural gas) a quarter turn only. Open oxygen cylinder valves completely. The valve wrench must be kept in place during use. Do not exceed 15 psi on the torch side of the gauge when using acetylene.

5.7.3 When lighting a torch, open the fuel gas valve on the torch before opening the oxygen valve. Use an approved spark striker.

5.7.4 All compressed gas cylinders should be kept in bottle-carts when transported or in use.

5.7.5 At the end of a shift, valves will be closed. If tanks are not to be used within 24 hours, regulators will be removed and protective caps secured.

5.7.6 Compressed-gas cylinders must be secured in a vertical position while in storage, transit or use.

5.7.7 When not in use, store oxygen and propane a minimum of twenty (20) feet apart, or on the opposite sides of a one half hour fire rated wall.

5.7.8 Keep oil and grease away from oxygen-regulator hose and fittings. Do not store wrenches, dies, cutters or other grease-covered tools in the same compartment with oxygen equipment.

5.7.9 Do not use compressed gas to clean your clothing, blow out anchor holes, or otherwise clean your work area.

5.7.10 All hoses, gauges and torches must be inspected regularly.

5.7.11 Adequate eye protection must be worn.

5.7.12 Never leave a torch in a vessel, tank or other closed container because of the potential hazard of leakage.

5.7.13 Never use oxygen in pneumatic tools, to pressurize a container, to blow out lines, or as a substitute for compressed air or other gases.

5.7.14 Place cylinders and hoses where they are not exposed to sparks and slag from a burning operation.

5.8 Handle Cylinders With Care, As Follows:

5.8.1 Lift to upper levels with approved lifting devices only (e.g.-cylinder skid, cradle, sling board, bottle cart, or pallet). DO NOT use magnets or choker slings.

5.8.2 Do not strike an arc on cylinders.

5.8.3 Do not use cylinders as rollers.

5.8.4 Do not lift by the protective cap.

NEVER use a torch unless anti-flashback arresters have been installed.

6. Forms

6.1 Hot Work Permit (SAF-29)

7. Regulatory / Permit Requirements

29 CFR 1926.350–352

29 CFR 1926.150-151

8. Record Keeping

None

Title	Date	Reference	Area
Blasting and the use of Explosives	**7/23/2012**	**3.18**	**Safety**

1. Summary

Under certain controlled instances, blasting agents and explosives are used as part of Brandenburg's overall demolition Plan. Although Brandenburg uses specialty subcontractors to perform explosives type work, all persons working around explosives need to have a general knowledge of safety procedures regarding blasting and the use of explosives. Due to the inherent dangers of blasting agents and explosives, anytime they are used, stored, handled, or transported, certain precautions must be adhered to.

2. Scope

All applicable Brandenburg personnel and work sites will be outlined within this procedure as required

3. Definitions

3.1 Blasting Agent – Any material or mixture, consisting of a fuel and oxidizer, intended for blasting, not as an explosive and in which none of the ingredients are classified as an explosive, provided that the finished product cannot be detonated by using a #8 test blasting cap when unconfined.

3.2 Explosive - Any chemical compound, mixture, or device, the primary or common purpose of which is to function by explosion. Examples of explosives include: dynamite, high explosives, slurries, and water gels, emulsions, black powder, pellet powder, initiating explosives, detonators, safety fuses, squibs, detonating cord, igniter cord and igniters.

3.3 Magazine - Any building, structure or container, other than an explosives manufacturing building, approved for the storage of explosive materials.

4. Responsibility

Responsibility of personnel will be outlined within this procedure as required

5. Methods

5.1 General Provisions

5.1.1 Only specifically authorized and qualified employees will be allowed to handle and use blasting agents and explosives.

5.1.2 Employees authorized to prepare explosive charges or conduct blasting operations shall use every reasonable precaution including, but not limited to, visual and audible warning signals, flags, or barricades, to ensure employee safety.

5.1.3 A subcontractor Demolition Plan will be submitted to Brandenburg prior to the commencement of blasting or the use of explosives.

5.1.4 Provisions will be made by the blaster prior to initiating blasting to warn other non-company employees who may be working in the area.

5.1.5 A safety person / lookout(s) will be stationed a safe distance from the blast site to ensure conditions are safe for blasting. This person(s) will also ensure that there is no vehicular or pedestrian traffic in the blasting area.

5.1.6 When blasting is done in congested areas or in proximity to a structure, railway, or highway, or any other installation that may be damaged, the blaster shall take special precautions in the loading, delaying, initiation, and confinement of each blast with mats or other methods so as to control the throw of fragments, and thus prevent bodily injury to employees.

5.1.7 Blasting operations in the proximity of overhead power lines, communication lines, utility services, or other services and structures shall not be carried on until the operators and/or owners have been notified and measures for safe control have been taken

5.1.8 Above ground blasting operations will be conducted during the hours between sun-up and sun-down.

5.1.9 Due precautions shall be taken to prevent accidental discharge of electric blasting caps from current induced by radar, radio transmitters, lightning, adjacent power lines, dust storms, or other sources of extraneous electricity. These precautions shall include:

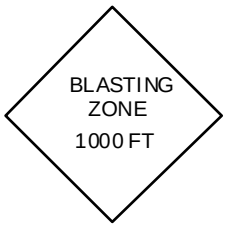
5.1.9.1 Detonators shall be short-circuited in holes which have been primed and shunted until wired into the blasting circuit

5.1.9.2 The suspension of all blasting operations and removal of persons from the blasting area during the approach and progress of an electric storm

5.1.9.3 Ensuring that mobile radio transmitters which are less than 100 feet away from electric blasting caps, in other than original containers, shall be de-energized and effectively locked;

5.1.9.4 Compliance with the recommendations of The Institute of the Makers of Explosives with regard to blasting in the vicinity of radio transmitters as stipulated in Radio Frequency Energy-A Potential Hazard in the Use of Electric Blasting Caps, IME Publication No. 20, March 1971;

5.1.9.5 The prominent display of adequate signs, warning against the use of mobile radio transmitters, on all roads within 1,000 feet of blasting operations. Signs shall be of a size and type as follows:



48" X 48"

42" X 36"

5.2 Magazines

5.2.1 General

5.2.1.1 Magazines have two classes:

5.2.1.1.1 Class I magazines are required when more than 50 pounds of explosives are stored.

5.2.1.1.2 Class II magazines can be used when less than 50 pounds of explosives are stored.

5.2.1.2 When two or more magazines are located on the same property, they must be separated in accordance with the Institute of Makers of Explosives guidelines.

5.2.1.3 All unclassified, newly developed, industrial, Class A, B or C explosives must be stored in magazines.

5.2.1.4 Blasting caps, detonators, primers and similar devices will not be stored with explosives.

5.2.1.5 The areas around the magazine will be free of brush, grass or debris for at least 25 feet.

5.2.1.6 The ground around the magazine will be sloped so that water does not accumulate, and drains away from the magazine.

5.2.1.7 Magazines should be kept clean, dry, cool, and well ventilated.

5.2.1.8 Magazines shall remain locked unless explosive materials are being physically handled, used and / or being transported to a place of storage.

5.2.1.9 Smoking and open flames are prohibited within 50 feet of magazine.

5.2.1.10 Combustibles should be prohibited from accumulating within 25 feet of magazine.

5.3 Storage General

5.3.1 All explosives will be stored in accordance with manufacturer's recommendations. Corresponding brands and grades will be stored together. All stock will be stored so that it may be easily counted and checked.

5.3.2 Magazines will not be used to store any metal tools or non-explosives (except for blasting devices).

5.3.3 Magazines should be clearly labeled " **EXPLOSIVES - KEEP OUT**"`

5.4 General Usage Requirements

5.4.1 No explosives will be abandoned.

5.4.2 Explosives which are obviously deteriorated or damaged will not be used.

5.4.3 Smoking, firearms, matches, open flame lamps, and other fires, flame or heat producing devices and sparks shall be prohibited in or near explosive magazines or while explosives are being handled, transported or used.

5.4.4 All loading and firing shall be directed and supervised by competent persons thoroughly experienced in this field.

5.4.5 All blasts shall be fired electrically with an electric blasting machine or properly designed electric power source, except as provided in 1926.906 (a) and (r).

5.4.6 During blasting, avoid excessive exposure to noise and remain outside blast area to minimize exposure to fly-rock until such time as the competent person signals “All Clear” and all fumes, dust and mists have subsided from the blast area.

5.4.7 All explosive related waste products will be disposed of in accordance with applicable current federal, state or local requirements.

5.5 Transportation

5.5.1 No one will be allowed to smoke, carry matches or any other flame producing device, or carry any firearms or loaded cartridges while in or near a motor vehicle transporting explosives or drive, load or unload a vehicle in a careless or reckless manner.

5.5.2 Vehicle marking will be done as follows:

5.5.2.1 Vehicle containing explosives, Class A, any quantity or a combination of Class “A and Class B will have the following marking: Explosives A (Red letters on white background).

5.5.2.2 Vehicle containing explosives Class B any quantity will be marked: Explosives B (Red letters on white background).

5.5.2.3 Vehicle containing oxidizing material (blasting agents, ammonium nitrate, etc.) 1,000 pounds or more gross weight will be marked: Oxidizers (Yellow letters on black background).

5.5.2.4 All markings or placarding will be done in accordance with Department of Transportation guidelines.

5.5.3 At a minimum, two (2) 10 lb. ABC rated UL approved fire extinguisher will be available on each vehicle used to transport explosives.

5.5.4 Every motor vehicle transporting any quantity of Class A or Class B explosives shall, at all times, be attended by a driver or other attendant of the motor carrier.

6. Forms

None

7. Regulatory / Permit Requirements

Blasting requirements vary from location to location. The need for logbooks or other recordkeeping will also vary.

29CFR1926.900

29CFR1910.109

8. Recordkeeping

Any recordkeeping (including a log) will be maintained by the licensed subcontractor.

Title	Date	Reference	Area
Fire Prevention and Protection	**7/23/2012**	**3.19**	**Safety**

1. Summary

Brandenburg employees, as a part of their normal job duties, work regularly with open flames when torch cutting. Supervisors and workers are aware that fire safety is an integral part of their work and, therefore, extreme importance is placed on addressing fire prevention and protection. This policy outlines Brandenburg's approach to addressing fire prevention and protection.

2. Scope

All applicable Brandenburg personnel and work sites will be outlined within this procedure as required

3. Definitions

None

4. Responsibility

Responsibility of personnel will be outlined within this procedure as required

5. Methods:

5.1 The following methods will be used as part of fire prevention and protection on Brandenburg projects and/or facilities:

5.1.1 The elimination of fire hazards will be an integral part of all job hazard inspections.

5.1.2 Wherever feasible, combustible materials shall be removed from the project prior to the initiation of hot work activities or other operations which constitute a fire hazard.

5.1.3 Flammable and combustible liquids will only be stored and handled in approved containers and portable tanks.

5.1.4 Oxygen tanks shall be stored separately from fuel-gas cylinders or combustible materials, a minimum distance of twenty (20) feet or by a noncombustible barrier at least five (5) feet high having a fire-resistance rating of at least one-half hour.

5.1.5 Smoking shall be prohibited at or in the vicinity of operations which constitute a fire hazard, and signs should be posted with "**No Smoking or Open Flame**."

5.1.6 The emergency contingency plan as outlined in the site-specific Health and Safety Plan (HASP) will be followed in the event that an emergency situation arises.

5.1.7 Personnel are trained to recognize and avoid fire hazards.

5.1.8 Brandenburg employees shall be trained in the proper use of portable fire extinguishers, in order to properly extinguish incipient types of fires.

5.1.9 Portable fire extinguishers, ABC type, firefighting equipment shall be provided in all fire hazard areas where the possibility of fire may occur. Placement will be within fifty (50) feet of all work areas. This includes a fire extinguisher rated not less than 10B within 50 feet of wherever more than 5 pounds of flammable gas (e.g.- welding & cutting areas) or more than 5 gallons of flammable or combustible liquids is being used.

5.1.10 The placement and maintenance of fire extinguishers will be the assigned work task of the Supervisors.

5.1.11 Portable fire extinguishers will be readily available for immediate access by all personnel for use in case of a fire emergency.

5.1.12 Portable fire extinguishers will be inspected on a monthly basis to ensure that they are in good operating condition.

5.1.13 Portable fire extinguishers will be inspected and tagged by a third party on an annual basis.

5.1.14 Portable fire extinguishers shall be mounted on each piece of heavy equipment, inspected by the operator daily, and maintained in good operating condition.

5.1.15 Good housekeeping practices will be implemented at all Brandenburg sites and facilities. Safety inspections stress fire hazards and fire prevention concerns.

5.1.16 Regular inspections will be conducted to assure that fire emergency equipment is functional, properly maintained and is currently certified.

5.1.17 All facility exits are marked with emergency exit signs as required by the NFPA and local fire departments.

5.1.18 All employees are made aware that proper housekeeping practices are critical in the prevention of fires. It is stressed that all walkways are kept free and clear in order to allow for prompt evacuation in case of an emergency.

5.1.19 All greasy and oily rags are to be deposited in fire proof containers. Such materials shall not be allowed to accumulate on any project site.

5.1.20 All compressed air, propane, acetylene, oxygen cylinders are to be properly stored in cylinder storage racks, bottle carts, or similar. They are to be secured in an upright position and caps securely fastened.

5.2 Fire Emergency Plan (General Rules)

5.2.1 Brandenburg employees are trained to follow the actions listed below in the event a fire occurs.
The acronym "**RACE**" is used as a reminder of the actions to be implemented.

5.2.1.1 **RESCUE**: Immediately remove all people that are at risk of exposure to fire, to a safe location.

5.2.1.2 **ALARM**: Notify the appropriate personnel per the emergency contingency plan.

5.2.1.3 **CONFINE**: If possible, without risk to you or your co-workers, confine the fire to the present fire location.

5.2.1.4 **EXTINGUISH**: Attempt to extinguish the fire only if it appears to be controllable by using equipment and methods readily available to you.

5.3 Responsibilities

5.3.1 Supervisors are responsible for implementing this policy, ensuring that preventative work practices and prevention measures are being followed by all employees, and conducting regular work area inspections.

5.3.2 Environmental Health & Safety (EHS) Managers shall make fire safety a priority when carrying out all site safety inspections.

5.3.3 Employees are responsible for following preventative work practices and prevention measures including but not limited to proper fire extinguisher and equipment use, good housekeeping, proper fuel storage and handling, and informing Supervisors of any unsafe condition that they cannot “make safe.”

6. Forms

None

7. Regulatory / Permit Requirements

29 CFR 1926.150-1

29 CFR 1926.152

29 CFR 1926.352

8. Record Keeping

Third party certification tags confirming inspection are placed directly on approved fire extinguishers.

Title	Date	Reference	Area
Power Actuated Tools	**7/23/2012**	**3.20**	**Safety**

1. Summary

This procedure provides guidance on safe use of powder-actuated tools.

2. Scope

All applicable Brandenburg personnel and work sites will be outlined within this procedure as required

3. Definitions

3.1 Powder-Actuated Tools - All fastening hand tools that use ignited black powder to create force to drive and anchor, nail or tack, etc.

4. Responsibility

Responsibility of personnel will be outlined within this procedure as required

5. Methods

5.1 Training

5.1.1 Only employees who have been trained in the operation of the particular tool in use shall be allowed to operate a powder-actuated tool.

5.1.2 A Certificate of Training shall be awarded to all workers successfully completing a course in the proper use of powder-actuated tools and the hazards associated with these tools.

5.2 Inspections

5.2.1 Before using the tool, the worker should inspect it to determine that it is clean, that all moving parts operate freely, and that the barrel is free from obstructions

5.2.2 Any tool found not in proper working order, or that develops a defect during use, shall be immediately removed from service and not used until properly repaired.

5.3 Safe Work Practices

5.3.1 These tools should not be used in an explosive or flammable atmosphere.

5.3.2 The tool should never be pointed at anybody.

5.3.3 Tools shall not be loaded until just prior to the intended firing time. Hands shall be kept clear of the open barrel end.

5.3.4 Loaded tools shall not be left unattended.

5.3.5 To prevent the tool from firing accidentally, two (2) separate motions are required for firing: one to bring the tool into position and the other to pull the trigger. The tools must not be able to operate until they are pressed against the work surface with a force of at least five (5) pounds greater than the total weight of the tool.

5.3.6 If a powder-actuated tool misfires, the employee should wait at least 30 seconds, and then try firing it again. If it still will not fire, the user should wait another 30 seconds so that the fault cartridge is less likely to explode, and then carefully remove the load. The misfired cartridge should be submerged in water.

5.3.7 Suitable eye, face and hearing protection are essential when using a powder-actuated tool and shall be used when utilizing these tools.

5.3.8 All tools shall be used with the correct shield, guard, or attachment recommended by the manufacturer.

5.3.9 Driving into materials easily penetrated shall be avoided unless such materials are backed by a substance that will prevent the pin or fastener from passing completely through and creating a flying projectile hazard on the other side.

5.3.10 Fasteners shall not be driven into very hard or brittle materials including, but not limited to, cast iron, glazed tile, surface-hardened steel, glass block, live rock, face brick, or hollow tile. Before fastening into any questionable material, the operator shall determine its suitability by using a fastener as a center punch. If the fastener point does not easily penetrate, is not blunted, and does not fracture the material, initial test fastening shall then be made in accordance with the tool manufacturer’s recommendations.

5.3.11 The tool shall be tested each day before loading to see that safety devices are in proper working condition. The method of testing shall be in accordance with the manufacturer's recommended procedure.

5.4 Storage

5.4.1 The Supervisor shall have the responsibility of securing the powder-actuated tool and its components when not in use.

5.4.2 All powder-actuated tools shall be stored in accordance with the manufacturer’s recommendations.

6. Forms

None

7. Regulatory / Permit Requirements

29 CFR 1926.302 (e)

8. Record Keeping

Employee training records are maintained Employee Files, SOP and Records Retention Form, QUA-05.

Title	Date	Reference	Area
Housekeeping	**7/23/2012**	**3.21**	**Safety**

1. Summary

Brandenburg strives to provide a safe and healthy environment for all employees. Brandenburg has established the requirements and responsibilities for routine housekeeping to insure that work areas are maintained in a clean manner and present an acceptable appearance. All employees are encouraged to take personal initiative in following the procedures outlined in this document and to continually contribute to a safe, clean and orderly environment.

2. Scope

All applicable Brandenburg personnel and work sites will be outlined within this procedure as required

3. Definitions

None

4. Responsibility

Responsibility of personnel will be outlined within this procedure as required

5. Methods

All personnel will work towards maintaining their respective workplaces in a clean and orderly manner.

5.1 Housekeeping encompasses all activities related to the cleanliness of the project site, materials, and equipment and the elimination of nonessential materials and hazardous conditions. The following general housekeeping practices shall be carried out where employees perform demolition, maintenance, construction or other activities:

5.1.1 Garbage, scrap, debris and other trash materials are to be properly disposed of in designated containers and shall be removed on frequent and regular intervals.

5.1.2 Containers used for garbage and other oily, flammable or hazardous wastes shall be equipped with covers or lids.

5.1.3 Material and equipment will be stored only in appropriate storage locations.

5.1.4 Floors should be maintained clean and as dry as reasonably practicable. Liquid spills are to be cleaned up immediately.

5.1.5 Equipment is to be kept clean and in good working condition.

5.1.6 Individual work areas are to be kept clean to insure that work activities may proceed in an orderly and efficient manner.

5.1.7 Shelved items must be placed in an orderly manner and arranged so that the items cannot easily fall while nearby items are being retrieved.

5.1.8 Items will not be placed in front of shelves so that employees must climb or reach over the items stored in front of the shelves to retrieve items.

5.1.9 Storage of unnecessary combustibles such as cardboard boxes is prohibited. Such items should be discarded immediately.

5.1.10 Every floor, working place, and passageway shall be kept free from protruding nails, splinters and loose boards.

5.2 Inspections

5.2.1 The Supervisor shall inspect his project on a daily basis to insure site is free of housekeeping concerns.

5.2.2 Environmental Health & Safety (EHS) Managers shall make housekeeping concerns a priority during their site inspections.

5.2.3 Guidelines for Inspection

5.2.3.1 Housekeeping is being maintained as an integral part of every work operation.

5.2.3.2 Receptacles are available for waste and debris.

5.2.3.3 Cleaning and removal of waste, debris, and dust is being performed regularly.

5.2.3.4 A sufficient number of waste receptacles are available to make their use convenient.

5.2.3.5 Stairways, aisles, corridors, and passageways are free from loose material and demolition debris and are not used for storage

5.2.3.6 Tools, cords, and other materials are not strewn about where they may cause tripping or other safety hazards

5.2.3.7 Locker rooms, employee change trailers, lunch trailers, washrooms, toilets, drinking fountains, and other similar facilities are being constantly maintained in a sanitary condition.

6. Forms

6.1 Safety Inspection Report (SAF-05)

7. Regulatory / Permit Requirements

7.1 29 CRF 1910.141

7.2 29 CRF 1926.25

8. Record Keeping

Safety Inspection Reports will be maintained in the database.

Title	Date	Reference	Area
Electrical Safe Work Practices	**7/23/2012**	**3.23**	**Safety**

1. Summary

Brandenburg's projects may require work activity on or near energized electrical components. Special precautions must be taken when this type of work is required. This procedure provides guidelines for qualified and non-qualified persons who must perform work activity on or near electrical components.

2. Scope

All applicable Brandenburg personnel and work sites will be outlined within this procedure as required

3. Definitions

3.1 Safety Related Work Practices - Procedural requirements to be followed that protect workers from the hazards of electricity, such as electric shock, burns, arc blasts or fires.

3.2 Qualified Person - A worker who is familiar with the construction and operation of the equipment and the hazards associated with electrical work activities, has the authority to perform the work and is using the proper personal protective equipment (PPE) and properly rated tools.

3.3 Non-Qualified Person - A worker who is <u>not</u> familiar with the construction and operation of the equipment and the hazards associated with electrical work activities, does not have the authority to perform the work or is not using the proper PPE or properly rated tools.

4. Responsibility

Responsibility of personnel will be outlined within this procedure as required

5. Methods

5.1 A hazard assessment will take place prior to the inception of site work involving any "live" electrical work. This hazard assessment may be documented in the Engineering Survey, safety survey, site-specific Health and Safety Plan (HASP), a Task Safety Analysis (TSA), or other similar document.

5.1.1 Examples of live electrical work may include but not limited to: terminating, switchyard, switch gear, circuit breakers (beyond throwing the breaker), lighting, cable relocations, pulling wire, cable trays, raceways, conduit, machines involving their wiring, grounding, and any other job that will require an employee to stand, sit, and climb on live electrical conduit, cables, cable trays or equipment.

5.2 The Operations Manager or Division Manager and the designated project Environmental Health & Safety (EHS) Manager will evaluate the reasons for performing the work under "live" conditions.

5.3 The qualified person will review and approve task control methods. These methods include the personal protective equipment requirements, circuit isolators (barriers), circuit insulators (blankets), grounding, or combination of the four.

5.4 Training Requirements - Qualified Persons

5.4.1 Brandenburg will ensure that all "qualified persons" who face a risk of electric shock are trained in safety related work practices that pertain to their assigned tasks. This training shall consist of learning: the skills and techniques for determining energized parts, methods to

identify the nominal voltage of exposed energized parts, techniques to establish proper clearance distances and selection and use of the proper tools and PPE. Qualified personnel will also be instructed in the methods and documentation of a pre-job briefing whenever work will be performed on or near exposed energized electrical systems.

5.5 Training Requirements – Non-Qualified Persons

5.5.1 Non-qualified persons shall be trained in and made familiar with safety related work practices such as the Hazardous Energy Control (Lock-Out / Tag-Out) Program (SOP 3.02), recognizing de-energizing parts, safe work clearances, and other safety related practices so as to prevent the risk of electric shock.

5.6 Safety Related Work Practices

5.6.1 Safety related work practices will be used to prevent employee injury from exposure to energized electric parts.

5.6.2 Only qualified workers are permitted to work on or near live electrical parts. Work exposure refers to employee accessing energized parts by direct contact or by tools.

5.6.3 When project activities involve working below or adjacent to energized overhead electrical lines, the lines shall be de-energized and grounded, or other protective measures shall be provided before work is started. If the lines are to be de-energized, arrangements shall be made with the person or organization that operates or controls the electric circuits involved to de-energize and ground them. If protective measures, such as guarding, isolating, or insulating, are provided, these precautions shall prevent employees from contacting such lines directly with any part of their body or indirectly through conductive materials, tools, or equipment.

5.6.4 When using approved insulated tools, qualified persons who are working below, above, or adjacent to energized power lines, shall follow the below listed clearance distances tools in order to avoid injuries associated with live electricity:

Up to 300V avoid contact

300V to 750……1 foot

751V to 46kV……3 foot

46.1 kV to 145kV …4 feet

for voltages over 145 kV refer to the clearance distances in NFPA 70-E Table 130.2 (C)

Qualified persons may approach energized lines if a) the qualified person is insulated from the energized part using properly rated and tested gloves, b) the energized part is properly insulated from all other conductive parts, or c) the qualified person is insulated from conductive parts at a potential difference using approved live line techniques.

5.6.5 In order to prevent injury from equipment and vehicles contacting electrical lines, all vehicles and equipment shall maintain a ten (10) foot clearance from all overhead, energized lines. Vehicles in transit with its structure lowered shall maintain a four (4) foot clearance. If the voltage is higher than 50kV, the clearance shall be increased four (4) inches for every 10kV over that voltage. When insulating barriers are in place, the clearance distance shall reflect the barrier's assigned clearance distance.

5.6.6 Employees on the ground having contact with aerial equipment involved near electrical work activities shall utilize protective equipment rated for the voltage and ensure that the equipment is insulated. Additional precautions, such as barricades or ground insulation, will be used to protect unprotected workers from hazardous ground potential or approaching aerial equipment.

5.6.7 All spaces that have exposed, energized electrical lines shall be well lighted, so as to prevent workers from accidental contact with energized lines.

5.6.8 The Supervisor shall ensure that protective equipment, insulated barriers, or insulated materials are used when employees are working in confined spaces that have exposed, energized electric lines. All doors, hinged panels and covers on panels or boxes shall be secured, so as to prevent swinging into the worker causing inadvertent contact with the live electric parts.

5.6.9 The Supervisor shall ensure that workers are protected when contact with conductive material or equipment (duct, piping, etc.) is readily foreseeable. Protective measures may include insulating the material or equipment, providing barriers or installing guarding around the material or equipment.

5.6.10 Only portable ladders with non-conductive side-rails (fiberglass only) will be used where a worker or the ladder may contact energized electrical parts. Ladders must be inspected prior to each use to assure no damage or contamination (moisture, paint or other conductive materials) is present that would defeat the insulating properties of the ladder.

5.6.11 Workers are prohibited from wearing jewelry, watches, necklaces, clothing with conductive thread, etc. when working on or near energized electric parts. The Supervisor may allow the covering of such items with tested and approved materials, rendering them non-conductive.

6. Forms

None

7. Regulatory / Permit Requirements

None

8. Recordkeeping

Completed checklists, permits and other documents will be kept in the project file.

Title	Date	Reference	Area
Hydro Mobile M2 System	**7/23/2012**	**3.24**	**Safety**

1. Summary

This procedure defines the requirements, practices, and procedures to protect employees from hazards while working from or operating a Hydro Mobile M2 system.

2. Scope

All applicable Brandenburg personnel and work sites will be outlined within this procedure as required

3. Definitions

3.1 Hydro Mobile M2 System - A mast climbing work platform

3.2 Competent Person – A person who:

3.2.1 Is capable of identifying existing and predictable hazards associated with the operation of the Hydro Mobile M2 System,

3.2.2 Has the authorization to take prompt corrective action, and implement measures to eliminate hazards.

3.2.3 Is familiar with the operator's manual and has it available at all times.

3.2.4 Has the experience and training to operate the system.

4. Responsibility

Responsibility of personnel will be outlined within this procedure as required

5. Methods

5.1 General Operation Rules:

5.1.1 A factory representative will be present during the erection (setting up) of the system.

5.1.2 The factory representative will inspect the system prior to each erection. Inspections must also take place after any occurrence that could affect the structural integrity. Any change in the condition of the system and any type of hazardous condition that may be present will be noted during the inspections. Any and all hazardous conditions will be corrected prior to allowing operation of the system by any worker.

5.1.2.1 The competent person shall insure that the capacity of the system is capable of supporting, without failure, its own weight and at least four times the maximum intended load applied or transmitted to it.

5.1.3 A competent person shall inspect the scaffold daily, weekly, monthly and annually (MNT-13A-D)

5.1.4 Following inspection and prior to employee access of scaffold, the competent person shall attach an easily identifiable safety tag when required by the site-specific Health and Safety Plan (HASP) and / or a customer policy.

5.1.4.1 The GREEN scaffold tag shall be used if the scaffold passes inspection and meets all requirements of OSHA 29 CFR 1926, Subpart L.

5.1.4.2 The YELLOW scaffold tag shall be used if the structure does not meet all the requirements of a green tagged scaffold. Work can continue on this type of scaffold platform but each worker must wear approved fall protection (PFAS) and be attached to a proper anchorage point.

Examples of when a YELLOW tag shall be used, include (but not limited to) when top or mid rails cannot be put in place because of equipment or existing construction (pipes, I beams); when a scaffold plank has been removed from a platform (i.e. to pass equipment); or anytime the working platform, top or mid rails, have been modified in order to place material around the platform work area.

5.1.4.3 The RED tag shall be used while a scaffold is being erected, taken down, or has been found to be defective. (Only scaffold erection and dismantling personnel may work off scaffolding with a RED tag). Any worker has the right to pull a tag from the holster and deem the scaffold “RED tagged” if they see an unsafe condition.

5.1.5 After installation, mark the “off-limit” areas of system with barriers (ie. warning tape, fencing)

5.1.6 Each person accessing the platform should use the staircase on the building or the climbable tower. Use of personal fall arrest system (PFAS) is required when climbing the tower to a height over ten (10) feet. Using the climbable tower on projects over 69 feet is not recommended.

5.1.7 Prior to raising or lowering the platform, locking pins must be removed.

5.1.8 There must be at least two (2) competent persons for each motorized unit in a setup. A motorized unit should never be operated by only one person.

5.1.9 The motorized unit must not be used or operated during an electrical thunderstorm.

5.1.10 The deposit of loads on the setup must be done with extreme care, under proper supervision. Loads must be equally distributed on all the bridges of the setup and deposited in the middle of each bridge, whenever possible.

5.1.11 Wind speeds must not exceed 28 mph (45km/h) during the erection and dismantling of a motorized unit setup (including the base, the bridges, the masts, the mast ties and all other components).

5.1.12 Platform must be kept level at all times.

5.1.13 Freestanding installations must not be exposed to wind speeds exceeding 28 mph (45km/h). A motorized unit setup with mast ties must not be exposed to wind speeds exceeding 35 mph (56 km/h) when in operation. A motorized unit setup equipped with weather protection must not be exposed to wind speeds exceeding 20 mph (32 km/h). Wind speeds must not exceed 94 mph (150 km/h) when the motorized unit setup is not in use.

5.1.14 No unauthorized persons will change or alter the system.

5.2 Training

5.2.1 The training program will cover the requirements and criteria for system operation. Training will be offered to all Brandenburg employees that work from or operate the system. All training shall be conducted by a competent person, documented and maintained.

5.2.2 All workers involved in the operation of the system shall be trained in the hazards associated with such operations. Awareness training will include Brandenburg's tagging system.

5.2.3 Retraining will be conducted every five (5) years, or sooner, as required by OSHA 29 CFR 1926.454 (c).

6. Forms

6.1 Hydro Mobile Daily Inspection Form (MNT-13A)

6.2 Hydro Mobile Weekly Inspection Form (MNT-13B)

6.3 Hydro Mobile Monthly Inspection Form (MNT-13C)

6.4 Hydro Mobile Annual Inspection Form (MNT-13D)

7. Regulatory / Permit Requirements

29 CFR 1926.450

8. Recordkeeping

Completed Scaffold (Hydro Mobile M2 System) Inspection Forms will be retained in the project file and per Records Retention Form, QUA-05.Employee training records are maintained per Employee Files, SOP and Records Retention Form, QUA-05.

Title	Date	Reference	Area
Commercial Diving Operations	**7/23/2012**	**3.25**	**Safety**

1. Summary

This procedure has been developed to protect the safety and health of all dive-team members during commercial diving operations.

2. Scope

All applicable Brandenburg personnel and work sites will be outlined within this procedure as required

3. Definitions

None

4. Responsibility

Responsibility of personnel will be outlined within this procedure as required

5. Methods

5.1 General

5.1.1 It is Brandenburg's policy that the "Consensus Standards for Commercial Diving and Underwater Operations" published by the Association of Diving Contractors International will serve as a safe practices manual.

5.1.2 The safe practices manual will contain safety procedures and checklists for diving operations, assignments and responsibilities of the dive-team members, equipment procedures and checklists, and emergency procedures.

5.1.3 The safe practices manual will be supplemented with pre-dive planning and assessments which will be reviewed with all dive-team members during the employee briefing.

6. Forms

6.1 Surface-Supplied Diving Operations Pre-Dive Checklist

6.2 Emergency Assistance Checklist

7. Regulatory / Permit Requirements

7.1 29 CFR 1910 Subpart T

7.2 Consensus Standards for Commercial Diving and Underwater Operations

8. Recordkeeping Requirements

None

Title	Date	Reference	Area
Structural Set Up Activities	**7/23/2012**	**3.26**	**Safety**

1. Summary

Brandenburg projects may potentially expose workers to hazards associated with structural set-up activities. When structural set-up activities are being utilized, this procedure must be adhered to.

2. Scope

All applicable Brandenburg personnel and work sites will be outlined within this procedure as required

3. Definitions

3.1 Competent Person - One who is capable of identifying existing and predictable hazards in the surroundings, or working conditions which are hazardous, or dangerous to employees, and who has authority to take prompt corrective measures to eliminate them.

3.2 Set-Up Activities - The preparing of structural members to facilitate a scheduled collapse of a structure.

3.3 Exclusion Zone - The exclusion zone is a demarcated area outside the structure at ground level intended to keep non-essential workers and machines outside of the area where the structure may fall.

3.4 Pre-Work Inspection – An inspection conducted by the competent person and applicable workers to inspect working conditions and identify hazards of the remaining structure prior to set-up activity.

4. Responsibility

Responsibility of personnel will be outlined within this procedure as required

5. Methods

5.1 General

5.1.1 A hazard assessment will take place prior to the inception of site work activity. This hazard assessment may be documented in the Engineering Survey, safety survey, site-specific Health and Safety Plan (HASP), or in the form of a Task Safety Analysis (TSA).

5.1.2 The competent person shall conduct a daily visual inspection and review setup work activities.

5.2 Access

5.2.1 When required, all employees are to utilize a canopied entrance to access the structures under demolition once workers are exposed to a hazard of falling materials.

5.2.2 All accesses to set-up areas within the structure are to be demarcated to limit access to essential persons involved with setup activities.

5.2.3 Prior to final cuts performed during set-up activities, the area outside the structure where the structure may collapse is to be demarcated as an exclusion zone.

5.3 Equipment

5.3.1 The use of heavy equipment may be required to facilitate setup work activities.

5.4 Set-Up Activities

5.4.1 Recognized hazards will be addressed prior to set-up work activities.

5.4.2 Set-up areas should be demarcated to limit access to essential persons during pre- and post-collapse activities.

5.4.3 Only designated walkways and stairwells shall be utilized by workers to access set-up work areas.

5.4.4 Escape routes should be kept clear of debris or obstructions to facilitate emergency escape of the structure.

5.4.5 Areas where hot work is to be performed should have a means to respond to incipient fires.

5.4.6 Only experienced persons shall be utilized to perform set-up activities.

5.4.7 Each worker or crew performing set-up activities will have radio communication.

5.5 Pre-Set-Up Safety Inspections

5.5.1 After each collapse of a structure, a Structural Pre-Set-Up Safety Inspection form (SAF-17) shall be completed by the competent person as described in the HASP.

5.5.2 Hazards identified during Structural Pre-Set-Up Safety Inspections shall be addressed prior to commencing additional work activities.

6. Forms

6.1 Structural Pre-Setup Safety Inspection (SAF-17)

7. Regulatory / Permit Requirements

None

8. Record Keeping

All completed inspections will be retained in the project file and per QUA-05 (Records Retention).

Title	Date	Reference	Area
Equipment Inspections	**7/23/2012**	**4.01**	**Safety**

1. Summary

All equipment must be inspected prior to use. Certain inspections must be documented and kept on file.

2. Scope

All applicable Brandenburg personnel and work sites will be outlined within this procedure as required

3. Definitions

3.1 Equipment Operator – A person assigned and qualified by the company to operate equipment

4. Responsibility

Responsibility of personnel will be outlined within this procedure as required

5. Methods

5.1 Inspection Requirements – General

5.1.1 All personnel assigned to operate equipment will be trained and qualified to both operate and inspect their equipment. All operators are responsible for inspecting their equipment prior to use.

5.1.2 Operators shall not operate any equipment that is defective when that defect could cause equipment failure while in use. Should a defect be discovered by the operator, the operator shall not run the equipment, but will inform his/her Supervisor. The Supervisor will remove the unsafe equipment from service. Defects found during inspection that do not constitute imminent danger will be noted on the respective inspection form when available and presented to the Maintenance Department for prompt resolution.

5.1.3 Specialized equipment requires documented checks at various time frames. Operators will perform an operational check at various times throughout the workday. A listing of the types of equipment and their required documented inspections is located in section 6 of this procedure.

5.2 Pre-Ignition Inspections

5.2.1 A walk-around inspection by the operator is required prior to equipment start up. The operator shall visually inspect the equipment for missing or loose bolts and pins, loose fittings and couplings, missing warning decals, damaged windshields, frayed cables and hoses, and loose tracks and pads. Also, any obvious body damage shall be noted on the inspection sheet. Make sure all covers and doors are closed and secured.

5.2.2 All equipment to be used shall be checked at the beginning of each shift to assure that certain parts, equipment, and accessories are in safe operating condition and free of apparent damage that could cause failure while in use. These include service brakes, including trailer brake connections; parking system (hand brake); emergency stopping system (brakes); tires; horn; steering mechanism; coupling devices; seat belts; operating controls; and safety devices. All defects shall be corrected before the equipment is placed in

service. All items identified with an asterisk (*) on Equipment Inspection Forms are considered to be critical to safe operation of equipment.

5.2.3 All fluid levels shall be checked. This includes but is not limited to: the battery, hydraulic system, fuel supply, brake system, cooling system, tire inflation and engine lubrication. All filler plugs, dipsticks, and caps shall be secured.

5.2.4 An open flame must never be used to check fluid levels or to look for leaks on equipment.

5.2.5 Equipment surfaces and ground beneath parked equipment shall be checked for evidence of leaking fluids.

5.2.6 Falling object / roll-over protection systems (FOPS / ROPS) along with any guards and seat belts or restraints must be in place and be in satisfactory condition.

5.2.7 Handholds, steps and ladders shall be in satisfactory condition and kept free of grease, mud and debris.

5.2.8 Housekeeping is essential to the safe operation of equipment. The operator's cab should be checked and cleared of tools, personal items, debris and other objects which may obstruct the movement of controls or the visibility of the operator. The control panel must be surveyed for any "Do Not Operate" or lock-out tags. Equipment shall not be operated until tags or deficiencies have been resolved.

5.3 Post Ignition Inspection

5.3.1 After start-up, all gauges should be checked for proper operation. The engine speed controls, lights, horns, steering and all other controls should be tested.

5.3.2 The operator should use his senses to detect any problems. Abnormal vibrations, sounds, smells, etc… detected during post ignition inspection shall be reported to the Supervisor immediately.

5.4 Operational Checks (During the Work Day)

5.4.1 The operator will check all gauges throughout the day for proper operation of the equipment. The engine speed controls, lights, horns, steering and all other controls shall also be checked.

5.4.2 Periodically, the operator will take a look around the vehicle, checking for unsafe conditions, (such as leaks). Should an unsafe condition be discovered, it will be resolved in the appropriate manner as specified above.

6. Forms

6.1 Daily Inspection Checklist – Hydraulic Excavator (MNT-01)

6.2 Daily Inspection Sheet – Commercial Motor Vehicle (MNT-02)

6.3 Daily Inspection Checklist - Manlift (MNT-03A)

6.4 Monthly Inspection Checklist - Manlift (MNT-03B)

6.5 Daily Inspection Checklist - Loaders (MNT-04)

6.6 Post Assembly Inspection.Hydraulic Crane (MNT-05A)

6.7 Daily Inspection Checklist.Hydraulic Crane (MNT-05B)

6.8 Daily Inspection Checklist.Rough Terrain Crane (MNT-05C)

6.9 Daily Inspection Checklist.Vehicle Inspection (MNT-07)

6.10 Daily Inspection Checklist.Forklift (MNT-08)

6.11 Daily Inspection Sheet.Support Equipment (MNT-12)

6.12 Hydro Mobile Inspection Forms (MNT-13A, 13B, 13C, 13D)

6.13 Monthly Overhead Crane Inspection (MNT-14B)

6.14 Daily Overhead Crane Inspection (MNT-14A)

6.15 Railcar Inspection Report (MNT-15)

7. Regulatory / Permit Requirements

29 CFR 1926.601

8. Recordkeeping

All inspection forms will be maintained by the Maintenance Department and per Records Retention Form, QUA-05.

Title	Date	Reference	Area
Cranes	**11/28/2012**	**4.02**	**Safety**

1. Summary

This procedure provides guidance on the safe use of mobile cranes and hoisting operations. Critical lift procedures will be adhered to when warranted.

2. Scope

All applicable Brandenburg personnel and work sites will be outlined within this procedure as required

3. Definitions:

3.1 Angle of Lift - Measurement of the angle between horizontal surface of a load and the lift chain measured in degrees. **This angle should never be less than 30 degrees.**

3.2 A/D Director (Assembly / Disassembly Director) – An individual who meets the requirements of directing the assembly and / or disassembly of a crane.

3.3 Assembly / Disassembly – The assembly and/or disassembly of equipment covered in this policy.

3.4 Critical Lift: The following are components of critical lifts:

3.4.1 Exceeds 75% of the crane's rated capacity for the crane configuration,

3.4.2 Requires the use of more than one crane to make the lift,

3.4.3 Is located such that the load or the crane boom could fall on electric lines, transformers, pipelines, reactors or vessels containing flammable, explosive, or hazardous gases or liquids etc.

3.5 Directly Under the Load – A part or all of an employee is directly beneath the load.

3.6 Drifting - The act of moving a suspended load in a horizontal direction.

3.7 Fall Zone – The area (including but not limited to the area directly beneath the load) in which it is reasonably foreseeable that partially or completely suspended materials could fall in the event of an accident.

3.8 Electrical Contact – Occurs when a person, object, or equipment makes contact or comes in close proximity with an energized conductor or equipment that allows the passage of current.

3.9 Point Loading - Lifting a load using the point of a hook instead of resting the sling in the saddle of hook.

3.10 Rated Capacity - The maximum working load permitted by the manufacturer under specified working conditions. Such working conditions typically include a specific combination of factors such as equipment configuration, radii, boom length, and other parameters of use.

3.11 Rigging – A general term for lifting equipment. Examples of rigging include but are not limited to: slings (wire and nylon), hitches, hooks, shackles, chain-falls, come-alongs, spreaders, lifting beams, etc.

3.12 Shock (Impact) Loading - A sudden load placed on a lifting component as a result of a rapid change in the direction of motion or the velocity of the load.

3.13 Tag Line - A rope or line attached to the load to control rotational movements.

4. Responsibility

Responsibility of personnel will be outlined within this procedure as required

5. Methods

5.1 Inspections

5.1.1 All cranes shall be inspected by a qualified person for mechanical defects upon completion of assembly and prior to use and documented on a Post Assembly Inspection Checklist – Hydraulic Crane (MNT-05A).

5.1.2 A competent person shall perform a visual inspection prior to each shift and document the findings on a Daily Inspection Checklist –Hydraulic Crane (MNT-05 B) or Daily Inspection Checklist – Rough Terrain Crane (MNT-05C).

5.1.3 A monthly inspection shall be performed and documented (MNT-05B or MNT-05C) by the competent person for each month the crane is in service. Monthly inspection documentation must be retained for a minimum of three (3) months.

5.1.4 An annual comprehensive inspection shall be conducted by a qualified person. This inspection shall include a functional test to determine that the equipment is functioning properly. Annual inspection documentation (MNT-05B or MNT-05C) must be retained for a minimum of twelve (12) months.

5.1.5 Equipment that has been idle for three (3) months or more shall undergo an inspection by a qualified person in accordance with the monthly inspection requirements.

5.1.6 Inspections shall ensure all cranes have been supplied with ABC type 20 lb. fire extinguishers.

5.1.7 Equipment that has had modifications or additions which affect the safe operation of the equipment (such as modifications or additions involving a safety device or operational aid, critical part of a control system, power plant, braking system, load-sustaining structural components, load hook, or in-use operating mechanism) or capacity must be inspected by a qualified person after such modifications/additions have been completed, prior to initial use.

Inspections will meet the following requirements:

5.1.7.1 Must assure that the modifications or additions have been done in accordance with the approval obtained pursuant to 29 CFR 1926.1434 (Equipment modifications).

5.1.7.2 Must include functional testing of the equipment

5.1.7.3 Equipment must not be used until an inspection under this sub-heading demonstrates that the requirements sub-heading 5.1.7.1 above have been met.

5.1.8 Equipment that has had a repair or adjustment that relates to safe operations (such as: a repair or adjustment to a safety device or operator aid, or to a critical part of a control system, power plant, braking system, load-sustaining structural components, load hook, or in-use operating mechanism), must be inspected by a qualified person after such a repair or adjustment has been completed, prior to initial use.

Inspections will meet the following requirements:

5.1.8.1 The qualified person must determine if the repair / adjustment meets manufacturer equipment criteria (where applicable and available)

5.1.8.2 Where manufacturer equipment criteria are unavailable or inapplicable, the qualified person must:

5.1.8.2.1 Determine if a registered professional engineer (RPE) is needed to develop criteria for the repair / adjustment. If an RPE is not needed, Brandenburg will ensure that the criteria are developed by the qualified person. If an RPE is needed, Brandenburg will ensure that they are developed by an RPE.

5.1.8.2.2 Determine if the repair / adjustment meets the criteria developed in accordance with sub-heading 5.1.8.2.1 above.

5.1.8.3 The inspection will include functional testing of the repaired / adjusted parts and other components that may be affected by the repair / adjustment.

5.1.8.4 Equipment will not be used until an inspection under this sub-heading demonstrates that the repair / adjustment meets the requirements of sub-heading 5.1.8.1 above (or where applicable, sub-heading 5.1.8.2 above)

5.2 Ground Conditions

5.2.1 The crane shall not be assembled or used unless ground conditions are firm, drained, and graded to ensure adequate support of the equipment and any supporting materials (per the manufacturer's specifications) and degree of level are maintained.

5.2.2 The operator and personnel shall be made aware of any hazards beneath the equipment (voids, tanks, utilities, etc.).

5.2.3 Brandenburg shall make every available attempt to ascertain (site drawings, as built drawings, soil analyses, etc.) underground hazards.

5.3 Assembly / Disassembly

5.3.1 Assembly / disassembly of equipment (or attachments) shall be directed by a person designated as the A/D Director.

5.3.1.1 The A/D Director shall meet the criteria of a qualified and competent person and have knowledge of the applicable assembly / disassembly procedures per the manufacturer's instructions and prohibitions.

5.3.2 The A / D Director shall ensure that the crew members understand all the requirements to safely implement the applicable assembly / disassembly procedures.

5.3.3 Power line safety (up to 350kV) during Assembly / Disassembly

5.3.3.1 No part of the equipment, load line, or load shall get closer than twenty (20) feet to a power line during the assembly / disassembly process. If this is not feasible, then Brandenburg shall:

5.3.3.1.1 Ensure the power line is de-energized and grounded, or

5.3.3.1.2 Determine the line's voltage and the minimum clearance distance permitted (see below)

MINIMUM CLEARANCE DISTANCES

Voltage (nominal, kV, alternating current)	Minimum clearance distance (feet)
up to 50	10
over 50 to 200	15
over 200 to 350	20
over 350 to 500	25
over 500 to 750	35
over 750 to 1,000	45
over 1,000	(As established by the utility owner/ operator or registered professional engineer who is a qualified person with respect to electrical power transmission and distribution)
Note: The value that follows "to" is up to and includes that value. For example, over 50 to 200 means up to and including 200kV.	

5.3.4 During lifting operations, no part of the crane, load line, or load (including rigging and lifting accessories) is allowed below a power line unless it is de-energized and grounded.

5.4 Operations

5.4.1 The crane operator shall not engage in any practice or activity that diverts his / her attention while engaged in operating the equipment, such as the use of cell phones.

5.4.2 The equipment, including its use with attachments, shall be operated in accordance with all of the manufacturer's applicable procedures. The equipment shall not be operated in excess of its rated capacity.

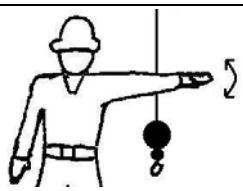
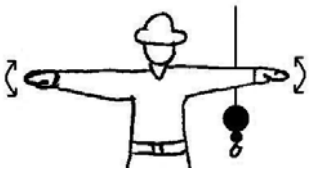
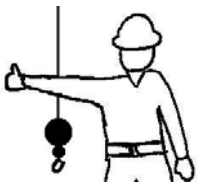
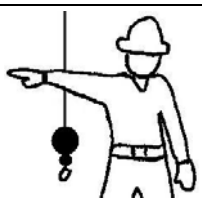
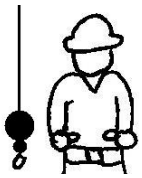
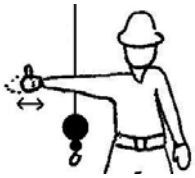
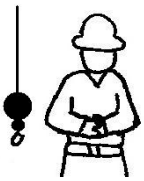
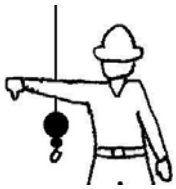
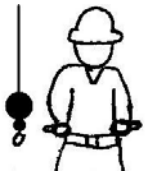
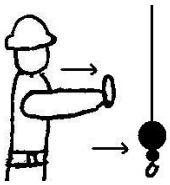
5.4.3 If a concern for safety exists, the operator has the authority to stop work until a qualified person has determined that safety has been assured.

5.4.4 Accessible areas within the swing radius of the rotating counterweight of a crane shall be barricaded or another effective method will be used to prevent personnel from being injured by the counterweight.

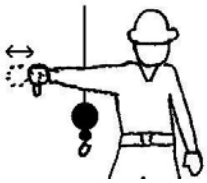
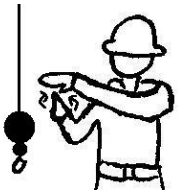
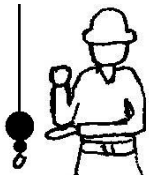
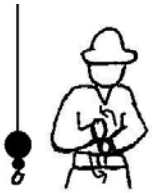
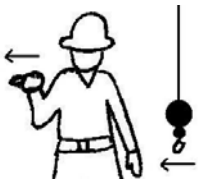
5.4.5 A designated signal person shall be provided if the operator's view is obstructed, if site-specific safety concerns require it, or if the operator determines that it is necessary. Hand signals used will be agreed upon by the operator and the signalman or flag person prior to the inception of work activities.

5.4.6 Except for an emergency, only the designated signal person will give signals to the operator. The crane operator shall obey a stop (or emergency stop) signal, regardless of who gives it.

5.4.7 Standard Method Hand Signals (see below)

 STOP – With arm extended horizontally to the side, palm down, arm is swung back and forth.	 EMERGENCY STOP – With both arms extended horizontally to the side, palms down, arms are swung back and forth.	HOIST – With upper arm extended to the side, forearm and index finger pointing straight up, hand and finger make small circles.
 RAISE BOOM – With arm extended horizontally to the side, thumb points up with other fingers closed.	 SWING – With arm extended horizontally, index finger points in direction that boom is to swing.	 RETRACT TELESCOPING BOOM – With hands to the front at waist level, thumbs point at each other with other fingers closed.
 RAISE THE BOOM AND LOWER THE LOAD – With arm extended horizontally to the side and thumb pointing up, fingers open and close while load movement is desired.	 DOG EVERYTHING – Hands held together at waist level.	LOWER – With arm and index finger pointing down, hand and finger make small circles.
 LOWER BOOM – With arm extended horizontally to the side, thumb points down with other fingers closed.	 EXTEND TELESCOPING BOOM – With hands to the front at waist level, thumbs point outward with other fingers closed.	 TRAVEL/TOWER TRAVEL – With all fingers pointing up, arm is extended horizontally out and back to make a pushing motion in the direction of travel.

Title	Date	Reference	Area
Cranes	**11/28/2012**	**4.02**	**Safety**

 LOWER THE BOOM AND RAISE THE LOAD – With arm extended horizontally to the side and thumb pointing down, fingers open and close while load movement is desired.	 MOVE SLOWLY – A hand is placed in front of the hand that is giving the action signal.	 USE AUXILIARY HOIST (whipline) – With arm bent at elbow and forearm vertical, elbow is tapped with other hand. Then regular signal is used to indicate desired action.
 CRAWLER CRANE TRAVEL, BOTH TRACKS – Rotate fists around each other in front of body; direction of rotation away from body indicates travel backward; rotation towards body indicates travel forward.	 USE MAIN HOIST – A hand taps on top of the head. Then regular signal is given to indicate desired action.	 CRAWLER CRANE TRAVEL, ONE TRACK – Indicate track to be locked by raising fist on that side. Rotate other fist in front of body in direction that other track is to travel.
 TROLLEY TRAVEL – With palm up, fingers closed and thumb pointing in direction of motion, hand is jerked horizontally in direction trolley is to travel.		

5.4.8 Communication devices used to transmit signals shall be tested before use and transmitted through a dedicated channel. Voice signals shall be agreed upon between the operator, signal person and lift director (if present).

5.4.9 A copy of the manufacturer's operator's manual for the make and model crane being utilized will be in the cab of the crane.

5.4.10 When both an auxiliary and main hoist line are used, an anti-two block device will be in place.

5.4.11 Attachments used with cranes will not exceed the capacity rating or scope recommended by the crane manufacturer.

5.4.12 No one will ride the headache ball, the hook, or the load being handled by the crane.

5.4.13 Equipment will not be lubricated while in use unless it is designed for safe lubrication application during use.

5.4.14 Only one (1) load line will be hoisted at a time. Two (2) or more separately rigged loads will not be hoisted in one (1) lift even if the combined loads are within the rated capacity.

5.4.15 All safety devices and operational aids required on the equipment shall be in proper working condition at all times.

5.5 Lifting Procedure for Routine Lifts

5.5.1 Determine the estimated weight of the load to be lifted.

5.5.2 Determine where the center of gravity is located.

5.5.3 Determine the type of sling, the reach, and angle of lift for the sling selected (i.e. chain or wire rope). The reach of the sling and the angle are a function of the distance between the points of attachment. A longer reach and a larger angle of lift will result in greater capacity. The loads on the sling legs are increased as the lift angle decreases.

5.5.4 Ensure the center of gravity of the load is directly below the crane hook or below the points of attachment. Different angles of lift result in unequal loads on individual legs of the sling.

5.5.5 Ensure the center of gravity is below the points of attachment.

5.5.6 For irregular loads, distribute the load among multiple sling legs to provide good stability and equal loading among legs.

5.5.7 A spreader beam may be used on long loads which cannot be supported from a single point without deforming or collapsing the load.

5.5.8 Remove all unsecured pieces from the load or secure loose pieces before the load is moved.

5.5.9 Whenever feasible, hoisting routes shall minimize exposure of personnel to hoisted loads.

5.5.10 No employee shall be within the fall zone, except when the operator is not moving the suspended load and the workers are:

5.5.10.1 Hooking, unhooking or guiding the load

5.5.10.2 Engaged in the initial attachment of the load

5.5.10.3 Landing a load, or

5.5.10.4 Essential to the operation

5.5.11 Immediately before lifting, a final visual check should be made to ensure slings are not twisted, knotted or improperly attached to the load.

5.5.12 Prior to lifting, a lay down area should be prepared and cribbing or battens placed to absorb shock, and protect the slings (choked loads).

5.5.13 Avoid shock loading caused by a sudden jerking or snatching of loads, which could impose loads on the lifting components in excess of the actual weight of the object to be lifted.

5.5.14 Raise the load to clear all objects in the load's intended path of travel.

5.5.15 Never leave a load suspended when the hoist or crane is unattended.

5.6 Critical Lift Procedure

5.6.1 The Critical Lift Procedure shall be used for every lift that meets the requirements outlined in Section 3.

5.6.2 Determine the estimated weight of the lift to be made.

5.6.3 Determine the capacity of the crane proposed to perform the lift. Items affecting capacity include but are not limited to:

5.6.3.1 Boom length,

5.6.3.2 Boom angle,

5.6.3.3 Counterweight,

5.6.3.4 Outriggers extended or retracted,

5.6.3.5 Attachments (jib, headache ball, load block, lifting devices, etc.).

5.6.4 The Critical Lift Permit (SAF-30) shall be completed prior to the "critical lift" by the competent person in charge of the lift

5.6.5 The Critical Lift Permit shall be completed and reviewed with all effected personnel involved in the lift before the lift begins.

5.7 Equipment Operations – Power Line Safety up to 350kV

5.7.1 Unless confirmed that it is de-energized and visibly grounded, assume that the power lines are energized.

5.7.2 In transit with no load and boom lowered, the equipment clearance shall be a minimum of six (6) feet for voltages less than 50kV, and ten (10) feet for voltages over 50 kV. up to and including 345 kV., and sixteen (16) feet for voltages up to and including 750 kV.

5.7.3 Boundaries, such as flagging, shall be placed to demarcate the area the equipment cannot go past.

5.7.4 If the equipment's maximum working radius can get closer than twenty (20) feet to a power line, Brandenburg shall ensure:

5.7.4.1 The power line is de-energized and grounded, or

5.7.4.2 Determine the line's voltage and the minimum approach distance permitted. See minimum clearance distances described in 5.3.3.

5.7.4.3 No part of the equipment, load line or load (including rigging and lifting accessories) is allowed below a power line unless it is de-energized and grounded.

5.8 Training, Qualification and Certification

5.8.1 The operator shall be qualified to operate the equipment or be certified through an accredited crane operator testing organization.

5.8.2 Each signal person shall meet the Qualification Requirements as per 29 CFR 1926.1428 prior to giving any signals.

5.8.3 Qualified rigger is a rigger who meets the criteria for a qualified person. A qualified person means a person who, by possession of a recognized degree, certificate, or professional standing, or who by extensive knowledge, training and experience, successfully demonstrated the ability to solve/resolve problems relating to the subject, the work or the project.

5.8.4 All crane operators will be instructed in or given the opportunity to read and understand the manufacturer's operations manual for the assigned equipment.

6. Forms

6.1 Post Assembly Inspection.Hydraulic Crane (MNT-05A)

6.2 Daily Inspection Checklist.Hydraulic Crane (MNT-05B)

6.3 Daily Inspection Checklist.Rough Terrain Crane (MNT-05C)

6.4 Daily Inspection Sheet.EOT Crane (MNT-14A)

6.5 Monthly Inspection Sheet.EOT Crane (MNT-14B)

6.6 Critical Lift Permit (SAF-30)

7. Regulatory / Permit Requirements

29 CFR 1926.1400

29 CFR 1926.1501

8. Recordkeeping

All inspection checklists will be maintained by the Maintenance Department per Records Retention Form, QUA-05.Employee training records are maintained per Employee Files, SOP and Records Retention Form, QUA-05.

Title	Date	Reference	Area
Suspended Work Platforms.Manbaskets	**1/23/2015**	**4.03**	**Safety**

1. Summary

The use of manbaskets may be necessary at times when conventional means of access (e.g., scaffold, ladders, aerial lifts) would be more hazardous or is not possible. This procedure outlines the safety requirements for using manbaskets.

2. Scope:

All applicable Brandenburg personnel and work sites will be outlined within this procedure as required

3. Definitions

None

4. Responsibility

Responsibility of personnel will be outlined within this procedure as required

5. Methods

5.1 General Work Practices

5.1.1 The use of equipment to hoist employees is prohibited except when Brandenburg can demonstrate that the erection, use, and dismantling of conventional means of reaching the work area would be more hazardous or is not possible because of structural design or worksite conditions.

5.1.2 Manbaskets must be used only for employees, their tools, and the materials necessary to do their work. Manbaskets must not be used to hoist materials or tools when not hoisting personnel.

5.1.3 Workers will keep all parts of their bodies inside the manbasket during raising, lowering and positioning. This does not apply to an occupant of the manbasket performing the duties of a signal person or positioning the manbasket when necessary.

5.1.4 Workers will not stand, sit on, or work from the top or intermediate rail or toeboard, or use any other means/device to raise their working height.

5.1.5 Workers will not pull the manbasket out of plumb in relation to the hoisting equipment.

5.1.6 A qualified person must determine if, in light of indications of dangerous weather conditions, or other impending or existing danger, it is not safe to lift personnel. If it is not, the lifting operation must not begin (or, if already in progress, must be terminated).

5.1.7 When wind speed (sustained or gusts) exceeds twenty (20) mph at the manbasket, a qualified person must determine if it is not safe to lift personnel.

5.1.8 Employees being hoisted shall remain in direct communication with the operator or signal person (where used).

5.1.9 Before employees exit or enter a hoisted manbasket that is not landed, the manbasket shall be secured to the structure where the work is to be performed, unless securing to the structure creates a greater hazard.

5.1.10 Hoisting personnel within twenty (20) feet of a power line that is up to 350 kV, and hoisting personnel within fifty (50) feet of a power line that is over 350 kV, is prohibited.

5.1.11 Workers occupying the manbasket will wear a safety harness with a lanyard appropriately attached to a structural member within the manbasket.

5.2 Manbasket Design

5.2.1 Manbaskets will be designed by a qualified person who is familiar with structural design. The basket will be designed and constructed for the specific purpose of hoisting personnel by means of a crane.

5.2.2 Lifting bridles on the manbasket shall be designed to minimize tipping of the basket due to the movement of employees occupying the basket. The manbasket itself shall be capable of supporting, without failure, its own weight and at least five (5) times the maximum intended load.

5.2.3 Headroom shall be provided which allows employees to stand upright in the manbasket.

5.2.4 A 42-inch high guardrail for perimeter protection of personnel within the manbasket will be maintained. The guardrail will be enclosed at least from the toeboard to mid-rail with either solid construction or expanded metal having openings of no greater than 1/2 inch, with a gate that swings inward only and equipped with a positive latch.

5.2.5 The personnel manbasket shall be conspicuously posted with a plate or other permanent marking which indicates the weight of the manbasket and its rated capacity.

5.2.6 A grab rail will be installed inside the entire perimeter of the manbasket except for access gates/doors. In addition to the use of hard hats, overhead protection shall also be provided when employees are exposed to falling objects. All welding shall be performed by a certified welder who is familiar with the weld grades, types and material specified in the platform design. All edges exposed to employee contact must be smooth enough to prevent injury.

5.3 Rigging

5.3.1 Hooks on overhaul ball assemblies, lower load blocks, or other attachment assemblies shall be of a type that can be closed and locked, eliminating the hook throat opening. Alternatively, an alloy anchor type shackle with a bolt, nut and retaining pin may be used. Hooks on overhaul ball assemblies, lower load blocks, or other attachment assemblies shall be closed and locked when attached.

5.3.2 When a wire rope bridle is used to connect the manbasket to the load line, each bridle leg shall be connected to a master link or shackle in such a manner to ensure that the load is evenly divided among the bridle legs.

5.3.3 Bridles and associated rigging for attaching the manbasket to the hoist line shall be used only for the manbasket and the necessary employees, their tools and the materials necessary to do their work and shall not be used for any other purpose when not hoisting personnel.

5.3.4 All eyes in wire rope slings will be fabricated with thimbles.

5.3.5 Wire rope, shackles, rings, master links, and other rigging hardware must be capable of supporting, without failure, at least five (5) times the maximum intended load applied or transmitted to that component, except that where rotation resistant rope is used. Where rotation resistant rope is used, the lines shall be capable of supporting without failure, at least ten (10) times the maximum intended load.

5.3.6 A safety line will be used and installed as illustrated in Attachment 4.03 A.

5.3.7 Tag lines shall be used when necessary to control the manbasket unless their use creates an unsafe condition.

5.4 Crane Set-up and Operation

5.4.1 The crane will be uniformly level within one (1) percent of level grade and located on firm footing that a qualified person has determined to be sufficiently firm and stable. Cranes equipped with outriggers or stabilizers shall have them all equally extended and locked in accordance with the manufacturer's procedures and load charts. Crane travel is prohibited while the manbasket is suspended. The crane operator will remain at the controls at all times, with the engine running, when the manbasket is suspended.

5.4.2 The total weight of the loaded manbasket and related rigging shall not exceed 50 percent of the rated capacity for the radius and configuration of the crane, except during proof testing.

5.4.3 The load line hoist drum shall have a system other than the load line hoist brake, which regulates the lowering rate of speed of the hoist mechanism (controlled load lowering). Free fall is prohibited.

5.4.4 Hoisting of the manbasket shall be performed in a slow, controlled, cautious manner with no sudden movements of the crane, or the manbasket.

5.4.5 Cranes with telescoping booms shall be equipped with a device to indicate clearly to the operator, at all times, the boom's extended length or must have measuring marks on the boom.

5.4.6 A positive acting device will be used which prevents contact between the load block or overhaul ball and the boom tip (anti-two-blocking device), or a system will be used which deactivates the hoisting action before damage occurs in the event of a two-blocking situation (two block damage prevention feature).

5.4.7 Load and boom hoist drum brakes, swing brakes and operator actuated secondary braking and locking features such as dogs and pawls or automatic secondary brakes will be engaged when the occupied work basket is in a stationary working position.

5.5 Inspection and Testing

5.5.1 The crane to be used and the manbasket will be inspected (SAF-41) by a competent person at the beginning of each shift and before hoisting employees in the manbasket.

5.5.2 A trial lift with the unoccupied manbasket loaded at least to the anticipated lift weight shall be made from ground level, or any other location where employees will enter the manbasket to each location at which the manbasket is to be hoisted and positioned. This trial lift shall be performed immediately prior to placing personnel on the manbasket. The competent person shall determine that all safety devices and operational aids are activated and functioning properly; that no interferences exist; the load radius to be used during the lift has been accurately determined, and that all configurations necessary to reach those work locations will allow the operator to remain under the 50 percent limit of the hoist's rated capacity. A single trial lift may be performed at one time for all locations that are to be reached from a single set up position.

5.5.3 The trial lift shall be repeated prior to hoisting employees whenever the crane is moved and set up in a new location or returned to a previously used location. Additionally, the trial lift shall be repeated when the lift route is changed unless the competent person determines that the new route presents no new factors affecting safety.

5.5.4 Immediately after the trial lift, the competent person must: conduct a visual inspection of the equipment, ground, and the manbasket, to determine whether the trial lift has exposed any defect or problem or produced any adverse effect; confirm that, upon completion of the trial lift process, the test weight has been removed.

5.5.5 After the trial lift, and immediately prior to each lift, the manbasket shall be hoisted a few inches with the personnel and materials/tools on board and inspected by a competent person to ensure that it is secure and properly balanced. Employees shall not be hoisted unless the following conditions are determined by a competent person to exist:

5.5.5.1 Hoist ropes shall be free of deficiencies in accordance with 29 CFR 1926.1413(a);

5.5.5.2 Multiple part lines shall not be twisted around each other;

5.5.5.3 The primary attachment shall be centered over the manbasket, and

5.5.5.4 The hoisting system shall be inspected if the load rope is slack to ensure all ropes are properly stated on drums and in sheaves.

5.5.6 Any condition found during the trial lift and subsequent inspection(s) that fails to meet a requirement of the Cranes and Derricks in Construction standard (29 CFR 1926 Subpart CC) or otherwise creates a safety hazard must be corrected before hoisting personnel.

5.5.7 At each job site, prior to hoisting employees on the manbasket, and after any repair or modification, the manbasket and rigging shall be proof tested to 125 percent of the manbasket's rated capacity by holding it in a suspended position for five (5) minutes with the test load evenly distributed on the manbasket (this may be done concurrently with the trial

lift). After proof testing, a competent person shall inspect the manbasket and rigging to determine if the test has been passed. Any deficiencies found shall be corrected and another proof test shall be conducted. Personnel hoisting shall not be conducted until the proof testing requirements are satisfied.

5.6 Pre-Lift Meeting

5.6.1 Prior to the commencement of a Pre-Lift meeting, a Health & Safety Division representative shall be included in a Pre-Planning meeting with the Operations Department to review lifting plans.

5.6.2 A Pre-lift meeting attended by the operator, signal person(s), employees to be lifted, and the Supervisor will be held to review this procedure and the work procedures to be followed.

5.6.3 Pre-lift meetings shall be documented and held prior to the trial lift at each new work location, and shall be repeated for any employees newly assigned to the operation.

6. Forms

6.1 Suspended Work Platforms (Manbaskets) Form (SAF-41)

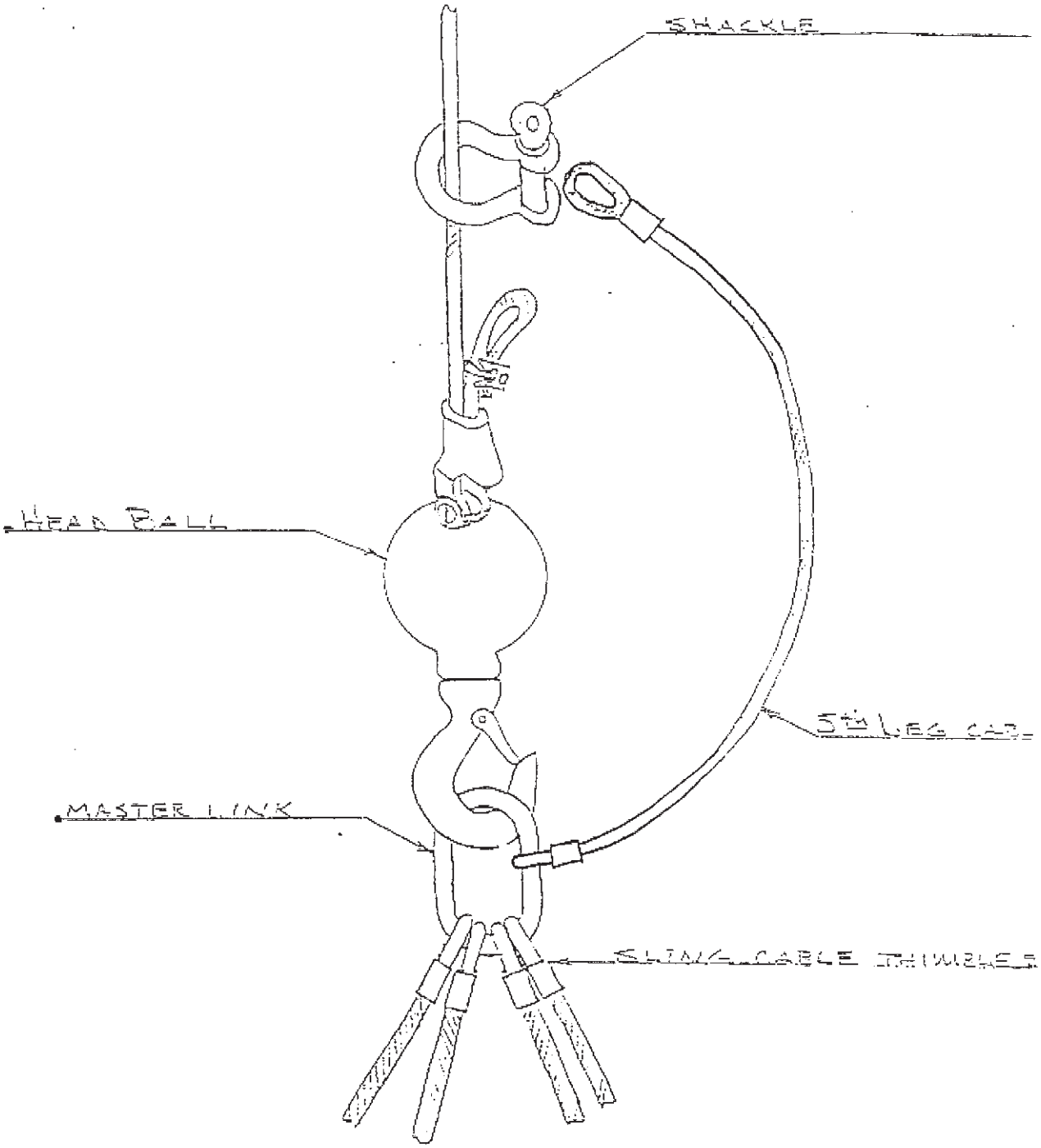
6.2 Typical Safety Cable Set-Up, Attachment 4.03A

7. Regulatory / Permit Requirements

29 CFR 1926.1431

8. Recordkeeping

All inspection forms will be maintained by the Maintenance Department and per Records Retention Form, QUA-05.Employee training records are maintained per Employee Files, SOP and Records Retention Form, QUA-05.



Typical Safety Cable Set-up
Used in all States except WA and MI

4.03 Attachment A

Title	Date	Reference	Area
Forklifts	**7/23/2012**	**4.04**	**Safety**

1. Summary

Operating forklifts in a safe manner is an integral part of Brandenburg's work activity. This procedure provides guidance on safely operating forklifts.

2. Scope

All applicable Brandenburg personnel and work sites will be outlined within this procedure as required

3. Definitions

None

4. Responsibility

Responsibility of personnel will be outlined within this procedure as required

5. Methods

5.1 Inspections

5.1.1 Forklifts shall be inspected daily by a qualified person. Daily Inspection Checklist - Forklift (MNT-08) will be used to document the inspection.

5.2 Training

5.2.1 Only trained, competent and certified operators are allowed to operate forklifts. Brandenburg provides formalized forklift training for all operators. This training consists of class room and hands on operational activities.

5.2.1.1 Operators are required to receive formal instruction, practical training, and performance evaluation. Operators shall receive training on each specific type of equipment.

5.2.1.2 Training certificates are presented upon successful completion of training.

5.2.2 The Health & Safety Division will ensure that forklift safety training is conducted by a knowledgeable, experienced and competent instructor. Formal instruction sessions include lecture and discussion, video presentation, practical demonstrations and trainee hands-on exercises.

5.2.3 Forklift operators shall receive initial training in truck-related topics and workplace-related topics as outlined below.

5.2.4 Truck-Related Topics:

5.2.4.1 Operating instructions, warnings, and precautions for the types of truck the operator will be authorized to operate;

5.2.4.2 Differences between the truck and an automobile;

5.2.4.3 Truck controls and instrumentation: where they are located, what they do, and how they work;

5.2.4.4 Engine or motor operation;

5.2.4.5 Steering and maneuvering;

5.2.4.6 Visibility (including restrictions due to loading);

5.2.4.7 Fork and attachment adaptation, operation, and use limitations;

5.2.4.8 Vehicle capacity;

5.2.4.9 Vehicle stability;

5.2.4.10 Any vehicle inspection and maintenance that the operator will be required to perform;

5.2.4.11 Refueling and/or charging and recharging of batteries;

5.2.4.12 Operating limitations;

5.2.4.13 Any other operating instructions, warnings, or precautions listed in the operator's manual for the types of vehicles that the employee is being trained to operate

5.2.5 Workplace-Related Topics

5.2.5.1 Surface conditions where the vehicle will be operated;

5.2.5.2 Composition of loads to be carried and load stability;

5.2.5.3 Load manipulation, stacking, and unstacking;

5.2.5.4 Pedestrian traffic in areas where the vehicle will be operated;

5.2.5.5 Narrow aisles and other restricted places where the vehicle will be operated;

5.2.5.6 Hazardous (classified) locations where the vehicle will be operated;

5.2.5.7 Ramps and other sloped surfaces that could affect the vehicle's stability;

5.2.5.8 Closed environments and other areas where insufficient ventilation or poor vehicle maintenance could cause a buildup of carbon monoxide or diesel exhaust;

5.2.5.9 Other unique or potentially hazardous environmental conditions in the workplace that could affect safe operation.

5.2.6 A certificate of training will be awarded to trainees that successfully complete the training. The certification shall include the name of the operator, the date of the training, the date of the evaluation, and the identity of the person(s) performing the training or evaluation.

5.3 Refresher Training and Evaluation

4.3.1 Refresher training in relevant topics shall be provided to the operator when:

5.3.1.1 The operator has been observed to operate the vehicle in an unsafe manner;

5.3.1.2 The operator has been involved in an accident or near-miss incident;

5.3.1.3 The operator has received an evaluation that reveals that the operator is not operating the truck safely;

5.3.1.4 The operator is assigned to drive a different type of truck; or

5.3.1.5 A condition in the workplace changes in a manner that could affect safe operation of the truck

5.3.2 An evaluation of each powered industrial truck operator's performance shall be conducted at least once every three (3) years.

5.4 Trailer Loading and Unloading

5.4.1 Operators shall ensure that all trailers, trucks, and railroad cars are secure prior to any loading or unloading operations.

5.4.2 Brakes shall be set and wheel blocks shall be in place to prevent movement of trucks, trailers, or railroad cars while loading or unloading. Fixed jacks may be necessary to support a semitrailer during loading or unloading when the trailer is not coupled to a tractor.

6. Forms

6.1 Daily Inspection Checklist.Forklifts (MNT-08)

7. Regulatory / Permit Requirements

29 CFR 1910.178

8. Recordkeeping

All inspection checklists will be maintained by the Maintenance Department and per Records Retention Form, QUA-05. Employee training records are maintained per Employee Files, SOP and Records Retention Form, QUA-05.

Title	Date	Reference	Area
Hazard Communication	**11/01/2014**	**5.01**	**Safety**

1. Summary

All workers are made aware of the chemical hazards that they are potentially exposed to in the work place through our Hazard Communication Program. This program includes OSHA's recent adoption of the Globally Harmonized System (GHS) and concentrates on three main areas: employee information and training, safety data sheets, and container labeling.

2. Scope

All applicable Brandenburg personnel and work sites will be outlined within this procedure as required

3. Definitions

3.1 SDS – Safety Data Sheet

4. Responsibility

Responsibility of personnel will be outlined within this procedure as required

5. Methods

5.1 Worker Training - General

5.1.1 All personnel who may be exposed to hazardous chemicals in their work area will be provided training.

5.1.2 Training Frequency

5.1.2.1 Workers will be trained in hazard communication during initial New Employee Orientation. A written certification record will be prepared for each employee trained by using the Hazard Communication Certificate of Training (SAF-12D).

5.1.2.2 Workers will also be trained when new physical or health hazards are introduced into their work area for which the worker has not been previously trained.

5.1.2.3 Supervisors have the responsibility to ensure that workers are trained on hazardous chemicals introduced into their work area. Daily safety meetings may provide additional training and review of the hazards associated with hazardous chemicals. This may be done by reviewing SDS, chemical analyses, highlighting hazards, and reviewing required PPE.

5.2 Content of Worker Training Program

Each worker will be trained as to the following:

5.2.1 The health and physical hazards associated with all hazardous chemicals found in the work area. This will include a review of the use and understanding of SDS.

5.2.2 Measures the employees can take to protect themselves from the hazard.

5.2.3 Explanation of the requirements of the standard and how Brandenburg's Hazard Communication Program operates.

5.2.4 Instructions on how to read and interpret information on labels and SDSs.

5.2.5 Information on the location of the written hazard communication plan and how employees can obtain and use the available hazard information.

5.2.6 Explanation of the specific procedures that Brandenburg has put in place to provide worker protection, such as: safe work practices, emergency procedures, and the use of personal protective equipment.

5.2.7 Information on methods and observations workers can use to detect the presence or release of a hazardous chemical in their work area.

5.3 Safety Data Sheets (SDS)

Besides ensuring that training is completed as stated above, Brandenburg will ensure the following:

5.3.1 SDS for all hazardous chemicals will be available on site to all personnel

5.3.2 A library of SDS will be maintained by the Health & Safety Division

5.4 Labeling

5.4.1 All containers will be labeled according to applicable regulations.

5.4.2 Adequate warnings will be evident on labels.

5.4.3 Manufacturer's labels will be used as the primary means of warning employees about hazardous materials. Labels are not to be removed from any container or defaced in any manner. Should a label be observed as missing or illegible, the worker will inform the Supervisor immediately, and the container may be temporarily labeled using the SDS.

5.4.4 Labels will include the following information:

5.4.4.1 Product Identifier

5.4.4.2 Signal Word

5.4.4.3 Hazard Statements

5.4.4.4 Precautionary Statements

5.4.4.5 Supplier Identification

5.4.4.6 Pictograms

Depending on the hazard severity of the chemical, each label will include at least one of these nine (9) pictogram symbols:

Title	Date	Reference	Area
Hazard Communication	**11/01/2014**	**5.01**	**Safety**

GHS - Hazard Pictograms and Related Hazard Classes

Exploding Bomb
- Explosives
- Self-reactives
- Organic Peroxides

Corrosion
- Skin corrosion/burns
- Eye damage
- Corrosive to metals

Flame Over Circle
- Oxidizing gases
- Oxidizing liquids
- Oxidizing solids

Gas Cylinder
- Gases under pressure

Enviroment
- Aquatic toxicity

Skull & Crossbones
- Acute toxicity (fatal or toxic)

Exclamation Mark
- Irritant (eye & skin)
- Skin sensitizer
- Acute toxicity
- Narcotic effects
- Respiratory tract irritant
- Hazardous to ozone layer (non-mandatory)

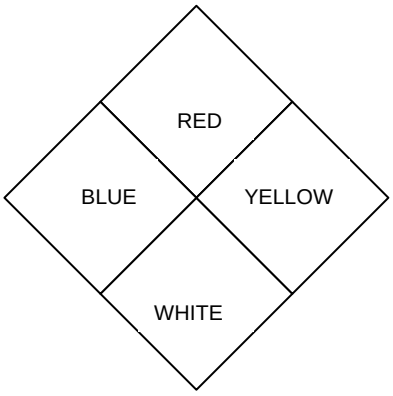
Health Hazard
- Carcinogen
- Mutagenicity
- Reprodcutive toxicity
- Respiratory sensitizer
- Target organ toxicity
- Aspiration toxicity

Flame
- Flammables
- Pyrophorics
- Self-heating
- Emits flammable gas
- Self-reactives
- Organic peroxides

5.4.1 Another acceptable form of hazard warning used by Brandenburg is the NFPA 704, Identification of the Fire Hazards of Materials system. The NFPA 704 system:

5.4.1.1 Identifies the hazards of a material in terms of four categories: "**Health**", "**Flammability**", "**Reactivity**" and "**Special Hazards**." The severity of each category is rated on a scale from 0-4 (0 indicating no special hazard, 4 indicating a severe hazard).

The marking is a diamond that is sub-divided into four, equal, smaller diamonds. The health section is colored BLUE and is on the left side of the diamond. The Flammability section is colored RED and is on the top of the diamond. The Reactivity section is colored YELLOW and is on the right side of the diamond. The Special Hazard section is colored WHTE and is at the bottom of the diamond.



5.4.2 Chemicals transferred into portable containers intended for immediate use by the employee who performs the transfer need not be labeled.

6. Forms

6.1 Hazard Communication Certificate of Training (SAF-12D)

7. Regulatory / Permit Requirements

29 CFR 1910.1200

8. Record Keeping

Employee training records are maintained per Employee Files, SOP and Records Retention Form, QUA-05.

Title	Date	Reference	Area
Benzene	**12/05/2013**	**5.02**	**Safety**

1. Summary

During the course of employment, some workers at Brandenburg may become exposed to materials that contain benzene. This procedure has been developed in order to protect workers and prevent benzene overexposure. There are a variety of work activities that may expose Brandenburg workers to benzene. These activities include handling of coke oven residues or related materials or other benzene containing materials. Other activities where workers may be exposed include demolition of vessels that may have contained or came into contact with material that contained benzene.

2. Scope

All applicable Brandenburg personnel and work sites will be outlined within this procedure as required

3. Definitions

3.1 Action Level (AL) - An airborne concentration of benzene of 0.5 parts per million (ppm) of air calculated as an 8-hour time weighted average (TWA) without regard to the use of respirators.

3.2 Benzene (C_6H_6) – A component of products derived from coal and petroleum and is found in gasoline and other fuels. It includes benzene contained in liquid mixtures and the benzene vapors released by these liquids. It does not include trace amounts of unreacted benzene contained in solid materials.

3.3 Permissible Exposure Limits (PELs)

3.3.1 Time-Weighted Average Limit (TWA). Brandenburg shall ensure that no employee is exposed to an airborne concentration of benzene in excess of one (1) ppm as an 8-hour time-weighted average.

3.3.2 Short-Term Exposure Limit (STEL). Brandenburg shall ensure that no employee is exposed to an airborne concentration of benzene in excess of five (5) ppm as averaged over any 15 minute period.

4. Responsibility

Responsibility of personnel will be outlined within this procedure as required

5. Methods

5.1 Assessments

5.1.1 Hazard Assessments

5.1.1.1 A hazard assessment will take place prior to the inception of site work activity. This hazard assessment may be in the form of an Engineering Survey, safety survey, daily safety meeting, site-specific Health and Safety Plan (HASP), Task Safety Analysis (TSA), or similar.

5.2 Air Monitoring Program

5.2.1 Initial monitoring shall take place at project sites where a reasonable potential for benzene exposure exists which is covered under §1926.1128.

5.2.2 If worker exposure is above the PEL, air monitoring will be performed every six months. Semiannual monitoring will continue until two (2) consecutive measurements taken at least seven (7) days apart are at or below the PEL, but at or above the action level.

5.2.3 If worker exposure is at or above the action level but below the PEL, monitoring will be performed at least every year.

5.2.4 Air monitoring may be discontinued if the initial monitoring reveals levels below the action level, or if periodic monitoring reveals two consecutive measurements taken at least seven (7) days apart are below the action level.

5.2.5 Monitoring will be conducted from breathing zone air samples that are representative of each employee's average exposure to airborne benzene.

5.2.6 Monitoring for the STEL shall be repeated as necessary to evaluate exposures of employees subject to short term exposures.

5.2.7 Monitoring may be increased if:

5.2.7.1 There have been worker complaints or symptoms which may be attributable to benzene exposure.

5.2.7.2 If additional information is discovered or observations are made which would indicate worker overexposure to benzene.

5.2.7.3 If there is a change of equipment, process, controls, or a new type of job is added that may result in new or additional exposure to benzene.

5.3 Analytical Results

5.3.1 The Environmental Health & Safety (EHS) Manager or designee will notify each affected employee of these results either individually in writing or by posting the results in an appropriate location that is accessible to employees within 15 working days after the receipt of the results.

5.3.2 Whenever PELs are exceeded, the written notification shall contain the corrective action being taken to reduce the exposure at or below the PEL.

5.4 Control Methods

5.4.1 Engineering Controls and Work Practices

5.4.1.1 Brandenburg will institute engineering controls and work practices to reduce and maintain employee exposure to benzene at or below the PELs to the extent feasible.

5.4.2 Respiratory Protection Program

5.4.2.1 Respiratory protection, in accordance with Policy 2.01 (Respiratory Protection), will be used in combination with engineering controls and work practices to maintain employee airborne benzene exposures below the PEL.

5.4.3 Protective Clothing and Equipment

5.4.3.1 Personal protective clothing and equipment shall be worn where appropriate to prevent eye contact and limit dermal exposure to liquefied benzene.

5.4.3.2 Brandenburg will provide protective equipment to employees and will ensure its use (in accordance with Policy 2.02 – Personal Protective Equipment (PPE)). Required PPE will vary by task and may include, but is not limited to, benzene resistant: coveralls; gloves; hardhats; shoe coverlets; face shields; goggles. Each site's PPE requirements will be listed in the site-specific Health and Safety Plan (HASP).

5.4.3.3 At no time will employees be allowed to leave the work area wearing any contaminated protective clothing or equipment.

5.5 Medical Surveillance

5.5.1 In general, medical surveillance will be followed in accordance with Policy and Procedure 1.12 (Medical Surveillance).

5.5.2 The following groups of workers will be included in a medical surveillance program:

5.5.2.1 Exposed to benzene at or above the action level for 30 or more days within 12 consecutive months.

5.5.2.2 Exposed to benzene at or above the PEL for 10 or more days per year.

5.5.3 All medical evaluations and procedures will be performed under the supervision of a licensed physician and all laboratory tests will be conducted by an accredited laboratory.

5.5.4 Emergencies

5.5.4.1 If a worker is exposed to benzene in an emergency situation, the worker will provide a urine sample at the end of the worker's shift. A urinary phenol test will be performed on the sample within 72 hours. If the result of the urinary phenol test is below 75 mg of phenol per liter of urine, no further action is required.

5.5.4.2 If the results indicate a concentration greater than 75 mg of phenol per liter of urine, the worker will undergo a complete blood count and additional examination and referrals as required.

5.5.5 Physician Written Opinion

5.5.5.1 Brandenburg will obtain and provide the affected worker a copy of the examining physician's written opinion within 15 days of the examination.

The written opinion will contain the following information:

5.5.5.1.1 Pertinent results of the medical examination and tests.

5.5.5.1.2 Physician opinion concerning whether the worker has any detected medical conditions which would place the employee's health at greater than normal risk of material impairment from exposure to benzene.

5.5.5.1.3 Physician recommended limitation upon the worker's exposure to benzene or upon the worker's use of PPE and respirators.

5.5.5.1.4 A statement that the worker has been informed by the physician of the results of the medical examination and any medical conditions results from benzene exposure which requires further explanation or treatment.

5.6 Medical Removal Plan

5.6.1 When a physician makes a referral to a hematologist/internist, the worker shall be removed from areas where exposures may exceed the action level until such time as the physician makes a determination of the worker's availability to work.

5.6.2 Whenever an employee is temporarily removed from benzene exposure, Brandenburg will transfer the employee to a comparable job for which the worker is qualified and where benzene exposures are as low as possible, but in no event higher than the action level.

5.6.3 Should a worker need permanent removal from benzene exposure, the worker will be given the opportunity to transfer to another position which is available or later becomes available for which the worker is qualified.

5.7 Communication of Benzene Hazards to Workers

5.7.1 Signs and labels.

Signs will be posted in regulated areas that indicate:

DANGER

BENZENE

CANCER HAZARD

FLAMMABLE – NO SMOKING

AUTHORIZED PERSONNEL ONLY

RESPIRATOR REQUIRED

Containers of materials that contain benzene will be properly labeled:

DANGER CONTAINS BENZENE CANCER HAZARD

5.7.2 Information and Training

5.7.2.1 Workers will be provided information and training at the time of their initial assignment to a work area where benzene is present. Safety data sheets (SDS) for benzene will be made available. If exposures are above the action level, workers will be provided with information and training at least annually thereafter.

5.7.2.2 Training will include hazard communication training and benzene-specific training such as medical surveillance program requirements, record keeping, and exposure records.

5.7.2.3 Worker medical records and exposure monitoring records will be made available upon employee request.

5.8 Observation of Monitoring

The employee or their designated representatives will be given an opportunity to observe the measuring or monitoring of employee exposure to benzene.

6. Forms

6.1 Benzene Exposure Notification (SAF-48)

7. Regulatory / Permit Requirements

29 CFR 1910.1028

8. Record Keeping

Air monitoring records are maintained per Records Retention Form, QUA-05.Employee medical and training records, including Exposure Notification Forms, are maintained per Employee Files, SOP and Records Retention Form, QUA-05.

Title	Date	Reference	Area
Lead	**10/3/2013**	**5.03**	**Safety**

1. Summary

There are a variety of work activities which may expose Brandenburg workers to lead. These activities include: structural demolition, soil excavation, lead abatement, using cutting torches and others. This procedure has been developed in order to protect workers from lead exposures.

2. Scope

All applicable Brandenburg personnel and work sites will be outlined within this procedure as required

3. Definitions

3.1 Action Level (AL) - Employee exposure, without regard to the use of respirators, to an airborne concentration of lead of 30 micrograms per cubic meter (30 $\mu g/m^3$) of air calculated as an 8 hour time weighted average (TWA).

3.2 Lead – A highly toxic, naturally occurring element found in the earth's surface

3.3 Permissible Exposure Limit (PEL) - The level of lead in the air to which an employee may be exposed over an 8 hour work day. The PEL for lead is 50 micrograms per cubic meter (50 $\mu g/m^3$).

4. Responsibility

Responsibility of personnel will be outlined within this procedure as required

5. Methods

5.1 General

5.1.1 Sources of lead vary among projects but can be generalized as follows:

- Material coated with lead based paint,
- Solder coated wire or other electrical components,
- Foundry sand,
- Pollution control dusts from industrial baghouses.
- Contaminated soil

5.1.2 Sources of lead exposure to employees center around activities: using torches to prepare scrap steel, setting up of structures for demolition (method of cutting steel members to weaken the structure in preparation for demolition), or preparing surfaces painted with lead based paint such as structural steel, bridge beams, equipment and machinery. Lead may also be encountered in contaminated soil and waste products, such as baghouse dust.

5.2 Hazard Assessments

5.2.1 A hazard assessment will take place prior to the inception of site work involving potential lead exposures. This hazard assessment may be documented in the Engineering Survey, safety survey, site-specific Health and Safety Plan (HASP), a Task Safety Analysis (TSA), or other similar document.

5.2.2 Employee exposure assessments will be performed to determine worker exposures to lead.

5.3 Air Monitoring

5.3.1 Monitoring will be conducted by sampling a representative number of workers who are expected to have the highest exposure levels (worst case scenario).

5.3.2 Historical exposure assessment data may be used for similar work conditions and tasks.

5.4 Analytical Results & Additional Monitoring

5.4.1 The Environmental Health & Safety (EHS) Manager or designee will, as soon as possible but no later than five (5) working days after the receipt of the air monitoring results, notify each affected employee of these results either individually in writing using the Lead Exposure Notification form (SAF-31) or by posting the results in an appropriate location that is accessible to employees.

5.4.2 If the results indicate an exposure greater than the PEL, the EHS Manager will advise the worker of the corrective action that has been taken or will be taken to reduce worker exposure.

5.4.3 If worker exposure is at or over the action level but below the PEL, monitoring will be performed at least every six (6) months. If two consecutive measurements taken at least seven (7) days apart indicate that the level is below the action level, monitoring may be discontinued.

5.4.4 If worker exposure is at or above the PEL, air monitoring will be performed every three (3) months. Quarterly monitoring will continue until two (2) consecutive measurements taken at least seven (7) days apart are at or below the PEL, but at or above the action level. At this point monitoring will be performed at least every six (6) months. Monitoring at the required frequency shall continue until at least two (2) consecutive measurements taken at least seven (7) days apart are below the action level at which time monitoring may be discontinued.

5.5 Control Methods

5.5.1 Respiratory Program

5.5.1.1 Respiratory protection will be used, in combination with engineering controls and work practices, to maintain employee airborne lead exposures below the PEL. Respiratory protection for airborne lead will correspond to the airborne lead concentrations as follows:

5.5.1.1.1 For concentrations of airborne lead below 500 $\mu g/m^3$ a half mask respirator equipped with a P100 filter will be used.

5.5.1.1.2 For concentrations of airborne lead equal to or greater than 500 $\mu g/m^3$ but less than 2500 $\mu g/m^3$ a full face mask with a P100 filter will be used.

5.5.1.1.3 For concentrations of airborne lead greater than 2500 $\mu g/m^3$ full face powered air purifying respirators (PAPRs) with P100 filters will be provided.

5.5.1.1.4 Should the worker choose a powered air purifying respirator (PAPR) instead of a negative pressure respirator, a PAPR will be provided

5.5.2 Personal Protective Clothing

5.5.2.1 Employees exposed to lead above the PEL or lead compounds which may cause skin or eye irritation are required to wear personal protective equipment. Clothing requirements will be evaluated on a task basis.

5.5.2.2 Brandenburg will provide protective equipment to employees and will ensure its use. Equipment varies by task and may include, but is not limited to: coveralls; gloves; hardhats; shoe coverlets; face shields; goggles.

5.5.2.3 Clean and dry changes of protective clothing will be issued at least weekly. Should workers become exposed to lead concentrations in excess of 200 $\mu g/m^3$ as a TWA, protective clothing will be issued daily.

5.5.2.4 The removal of lead from protective clothing by blowing, shaking, or any other means which disperses lead into the air is prohibited.

5.5.2.5 Brandenburg will ensure reusable clothing is laundered and repaired as necessary. Third party services used to launder and repair clothing will be informed, in writing, of the potentially harmful effects of exposure to lead.

5.5.2.6 Disposable protective clothing will not be used for more than one (1) work shift. Disposable clothing will be collected in closed containers, in a project designated change area.

5.5.2.7 Clothing containers will be labeled as follows: "**Caution: Clothing Contaminated With Lead. Do not remove dust by blowing or shaking. Dispose of lead contaminated wash water in accordance with applicable local, state, or federal regulations**."

5.5.3 Work Practices

Workers will be trained to perform their work tasks in a manner that will minimize their exposures to airborne lead and other contaminants. This training will include:

5.5.3.1 Standing upwind when using a cutting torch or any time there might be exposure to lead dust and fumes.

5.5.3.2 Keeping their face and breathing zone as far away as possible from the work so as to minimize their exposure to lead fumes.

5.5.3.3 Obtaining ventilation such as fans or air movers to remove contaminated air and introduce non-contaminated air into the worker's breathing zone.

5.5.4 Housekeeping/Hygiene Facilities

5.5.4.1 Where feasible, clean change trailers will be provided at all jobs where lead concentrations exceed the PEL. The change trailers will be equipped with a dirty room, shower room, and clean room.

5.5.4.2 Where feasible, all employees exposed to airborne concentrations of lead above the PEL will be required to shower at the end of the work shift

5.5.4.3 At a minimum, employees will be responsible for washing their hands and face at the end of each work shift, and prior to eating, drinking, using tobacco products, or applying cosmetics.

5.5.4.4 Where feasible, HEPA filtered vacuum cleaners will be used for housekeeping.

5.5.4.5 At no time will employees be allowed to leave the work area wearing any contaminated protective clothing or equipment.

5.5.4.6 Accumulations of lead containing dust and debris generated by work activities will be removed as soon as practical based on the work to be performed and constraints of the job.

5.6 Medical Surveillance

5.6.1 Employees exposed to lead at or above the action level on any day will be provided initial medical surveillance consisting of biological monitoring in the form of blood sampling and analysis for lead and zinc protoporphyrin levels.

5.6.2 The EHS Manager will receive and review the results and the worker will be advised of the results in writing using the Employee Blood Lead Level Notification- Above or Below Criteria form(s) (SAF-34 <u>or</u> SAF-35) within five (5) working days.

5.6.3 Employees exposed to lead at or above the action level for 30 or more days within 12 consecutive months will be included in a medical surveillance program.

5.6.4 Elements of the program include: medical examinations performed under supervision of a licensed physician; biological monitoring in the form of blood sampling and analysis for lead and zinc protoporphyrin through an OSHA approved laboratory.

5.6.5 For each employee included in the medical surveillance program, biological monitoring will be conducted at least every two (2) months for the first six (6) months and every six (6) months thereafter.

5.6.6 Employees whose periodic blood sampling and analysis indicates a blood lead level at or above 40 μg/dl shall be tested at least every two (2) months. This frequency shall be continued until two (2) consecutive blood samples and analyses indicate a blood lead level below 40 μg/dl.

5.6.7 Employees whose periodic blood sampling and analyses indicates a blood lead level at or above 50 μg/dl shall be tested a second time within two (2) weeks of receiving the first set of

data. Should the second test confirm elevated blood lead levels, the worker will be reassigned to other job duties.

5.6.8 Employees who are removed from exposure to lead due to an elevated blood lead level are required to undergo at least monthly blood sampling during the removal period.

5.6.9 Employees, who, within a 12 consecutive month period, experience blood lead levels at or above 40 μg/dl, will be required to undergo a medical examination / consultation. A copy of the physician's written medical opinion will be made available to the employee.

5.7 Training

5.7.1 Training will be provided to all employees who may be exposed to airborne concentrations of lead at or above the action level on any day. Elements of the program include: initial and annual refresher training, elements of the standard, operations which could result in exposure to lead above the action level, use and care of respirators, purpose and description of the medical surveillance program including health effects from overexposure, engineering controls and work practices, compliance strategy, warning concerning the use of chelating agents to reduce blood lead levels, and explanation of the employee's rights to access information. Appendices A and B of OSHA's lead standard 29 CRF 1910.1025 and 1926.62 will be reviewed.

5.8 Work Areas

5.8.1 Prior to commencement of activities which may cause airborne concentrations of lead at or above the action level, access to the work area will be restricted by means that include, but are not limited to: existing walls, buildings, demarcating an area with ropes, barricade tape, caution cones, or establishing critical barriers with plastic sheeting.

5.8.2 Access to the work area will be controlled. Personnel entering and leaving the work area must wear appropriate PPE. Eating, drinking, tobacco products or cosmetics will only be allowed outside the work area.

5.8.3 Warning signs will be posted in the work areas where employee lead exposures exceed the PEL.

5.8.4 Warning signs will be posted at potential ingress/egress areas. The signs will be easily visible from a distance, so personnel can take protective measures before entering the work area.

5.8.5 Engineering controls will be used whenever feasible to reduce or eliminate the airborne concentration of lead. These controls may include the following:

- Torches with three foot handles used to keep fumes away from employee's breathing zone,
- Use of mechanical equipment (hydraulic shears, electric saws etc.) to prepare steel.
- Use of HEPA vacuum equipped power tools
- Use of ventilation whenever feasible

6. Forms

6.1 Lead Exposure Notification Form (SAF-31)

6.2 Employee Blood Lead Level Notification Form – Below Criteria Level (SAF-35)

6.3 Employee Blood Lead Level Notification Form – Above Criteria Level (SAF-34)

7. Regulatory / Permit Requirements

29 CFR 1926.62

8. Record Keeping

Air monitoring records are maintained per Records Retention Form, QUA-05.Employee medical and training records, including Exposure Notification Forms, are maintained per Employee Files, SOP and Records Retention Form, QUA-05.

Title	Date	Reference	Area
Asbestos	**7/23/2012**	**5.04**	**Safety**

1. Summary

Brandenburg workers may come in contact with various asbestos containing material (ACM) during the normal course of work activity. Workers who abate or work with ACM receive: asbestos training, medical surveillance, and respirator fit testing. Work shall comply with all local, state and federal regulations pertaining to asbestos-related work activities.

2. Scope

All applicable Brandenburg personnel and work sites will be outlined within this procedure as required

3. Definitions

3.1 Adequately Wet – Sufficiently mixed or penetrated with liquid to prevent the release of particulates.

3.2 Asbestos - A naturally occurring mineral, having a definite chemical composition and crystalline form. Asbestos is classified as either serpentine (chrysotile), or amphibole (amosite, crocidolite, anthophyllite, actinolite, and tremolite).

3.3 Asbestos Containing Material (ACM) - Any material containing more than one percent asbestos by weight as determined by using polarized light microscopy (PLM).

3.4 Class I Asbestos Work - Activities involving the removal of Thermal System Insulation (TSI) and surfacing ACM and presumed asbestos containing material (PACM).

3.5 Class II Asbestos Work - Activities involving the removal of ACM which is not thermal system insulation (TSI) or surfacing material. This includes, but is not limited to, the removal of asbestos containing wall board, floor tile and sheeting, roofing and siding shingles, and construction mastics.

3.6 Class III Asbestos Work – Repair and maintenance operations, where ACM including TSI and surfacing ACM and PACM is likely to be disturbed.

3.7 Class IV Asbestos Work – Maintenance and custodial activities during which employees contact but do not disturb ACM or PACM and activities to clean up dust, waste debris resulting from Class I, II, and III activities.

3.8 Competent Person - One who is capable of identifying existing asbestos hazards in the workplace and selecting the appropriate control strategy for asbestos exposure, who has the authority to take prompt corrective measures to eliminate them, and who is specifically trained in a course meeting the EPA's Model Accreditation Plan for Supervisor.

3.9 Excursion Limit – 1.0 fiber per cubic centimeter of air (1 f/cc) as averaged over a sampling period of thirty minutes, as determined when using the appropriate laboratory method.

3.10 Friable - Material is considered friable when dry, it can be crumbled, pulverized, or reduced to powder by hand pressure.

3.11 Initial Exposure Assessment (IEA) - An exposure assessment conducted immediately before or at the initiation of the operation to ascertain expected exposures during that operation or workplace. The assessment must be completed in time to comply with requirements which are triggered by exposure

data or lack of a negative exposure assessment and to provide information necessary to assure that all control systems planned are appropriate for that operation and will work properly.

3.12 Leak Tight - Solids or liquids cannot escape or spill out.

3.13 Negative Exposure Assessment (NEA) - Demonstration by the employer (through representative data) that employee exposure during an operation is expected to be consistently below the permissible exposure limit (PEL).

3.14 Permissible Exposure Limit (PEL) – 0.1 fiber per cubic centimeter of air as an eight (8) hour time-weighted average (TWA), as determined by the appropriate laboratory method.

3.15 Presumed Asbestos Containing Material (PACM) - Thermal system insulation (TSI) and surfacing material found in buildings constructed no later than 1980.

4. Responsibility

Responsibility of personnel will be outlined within this procedure as required

5. Methods

5.1 Hazard Assessment

5.1.1 A hazard assessment will take place prior to the inception of site work activity. This hazard assessment may be in the form of a safety survey, daily safety meeting, site-specific Health and Safety Plan (HASP), a Task Safety Analysis (TSA) or other similar document.

5.2 Competent Person.

5.2.1 All sites will have a competent person assigned to them.

5.2.2 The competent person will perform health and safety prevention programs to provide for frequent and regular inspections of projects.

5.2.2.1 The competent person will make on-site inspections for Class I jobs as least once during each work shift, and at any time an employee requests an inspection.

5.2.2.2 For Class II, III and IV jobs, on-site inspections will be made at intervals sufficient to assess whether conditions have changed, and at any reasonable time, or when a worker requests an inspection.

5.2.3 For all worksites engaged in Class I or II work, the competent person will perform or ensure the following duties:

5.2.3.1 Set up the regulated area, enclosure, or containment.

5.2.3.2 Ensure (by on-site inspection) the integrity of the enclosure or containment.

5.2.3.3 Set up procedures to control entry and exit from the enclosure and/or area.

5.2.3.4 Supervise employee exposure monitoring.

5.2.3.5 Ensure that workers within the enclosure are wearing an appropriate respirator and PPE as required.

5.2.3.6 Ensure workers use engineering controls, work practices and PPE properly.

5.3 Regulated Areas

5.3.1 Indoor Regulated Areas

5.3.1.1 All Class I, II and III asbestos work will be conducted within regulated areas.

5.3.1.2 The areas will be demarcated to minimize the number of persons within the area and protect persons outside the area from exposure to airborne asbestos.

5.3.1.3 All persons in the regulated areas must wear the appropriate respirator.

5.3.1.4 Wastes and debris will be cleaned up and disposed of promptly.

5.3.1.5 Wastes and debris contaminated with asbestos will be placed in leak-tight containers.

5.3.1.6 Vacuum cleaners equipped with HEPA filters will be used to collect debris and dust containing ACM and PACM.

5.3.1.7 Wet methods or wetting agents to control visible emissions and worker exposures during asbestos abatement will be used except where the use of wet methods is not feasible.

5.3.1.8 Should airborne concentration of fibers below the PEL not be attainable, work practices to attain lowest levels will be used.

5.3.1.9 Warning signs that demarcate the regulated area will be provided and displayed at each location where a regulated area is established. Signs will be posted at such a distance so that an employee may read the signs and take necessary protective steps before entering the area marked by the signs.

The warning signs will state the following

DANGER

ASBESTOS

CANCER AND LUNG DISEASE HAZARD

AUTHORIZED PERSONNEL ONLY

In addition, where the use of respirator and protective clothing is required in the regulated area, the warning signs will include the following:

"**RESPIRATORS AND PROTECTIVE CLOTHING ARE REQUIRED IN THIS AREA**"

5.3.2 Outdoor Regulated Areas

Work in outdoor regulated areas will be performed in the same manner as work indoors, except for the following:

5.3.2.1 Prompt clean up and disposal of wastes and debris contaminated with asbestos will be placed in containers that are lined with 6 mil poly and adequately secured.

5.3.2.2 Vacuum cleaners equipped with HEPA filters to collect debris and dust containing ACM and PACM will be used when feasible. Otherwise debris will be collected on the working surface (on the ground) on impermeable drop cloths. The impermeable drop cloths will be collected by rolling them up from the ends, and capturing any ACM within them. The impermeable drop cloths will then be disposed of in an appropriate manner.

5.3.2.3 Critical barriers shall be placed over all openings to the regulated area

5.3.3 Prohibitions

5.3.3.1 Abrasive disc saws not equipped with point of cut ventilator or enclosures with HEPA filtered exhaust air.

5.3.3.2 Compressed air unless the air is used in conjunction with an enclosed ventilation system of proper design.

5.3.3.3 Dry sweeping, shoveling or other dry clean-up of dust and debris.

5.3.3.4 Worker rotation as a method to limit worker exposure.

5.3.3.5 Eating, drinking, smoking, chewing tobacco or gum or applying cosmetics in the regulated area.

5.3.3.6 Unauthorized persons accessing regulated areas.

5.4 Exposure Assessments and Monitoring

All monitoring will comply with Brandenburg's Air Monitoring Policy (1.04).

5.4.1 Initial Exposure Assessment

Unless a negative exposure assessment (NEA) has been made, an initial exposure assessment (IEA) will be conducted by a competent person immediately before or at the initiation of the operation to ascertain expected exposures during the operation.

5.4.2 General Monitoring

Representative 8 hour TWA employee exposure will be determined on the basis of one (1) or more samples representing full shift exposure for workers in each work area. Representative short term employee exposures will be determined on the basis of one (1) or more samples representing 30 minute exposures associated with operations that are most likely to produce exposures above the excursion limit (EL) for workers in each work area. The assessment will take into consideration the monitoring results and all observations, and

information or calculations which indicate worker exposure to ACM, including any previous monitoring conducted in the workplace, or of the operations which indicate the levels of ACM likely to be encountered on the job. Until determined otherwise, workers will be considered exposed in excess of the TWA and excursion limit (EL).

5.4.3 Negative Exposure Assessment

Brandenburg may demonstrate that asbestos worker exposure is below PELs by:

5.4.3.1 Objective data indicating that the material cannot release airborne fibers in concentrations exceeding the TWA and excursion limit (EL) under those work conditions having the greatest potential for releasing asbestos.

5.4.3.2 Historical data collected within 12 months from jobs closely resembling the processes, type of material, control methods, work practices, and environmental conditions used and prevailing in the current operations.

5.4.4 Periodic Monitoring

5.4.4.1 Daily monitoring will be performed for all Class I and II operations, unless a negative exposure assessment (NEA) for the entire operation has been completed.

5.4.4.2 For other than Class I and Class II operations, periodic monitoring (sufficient frequency to document the validity of the exposure prediction) will be performed where exposures are expected to exceed the PEL

5.4.5 Termination of Monitoring

If periodic monitoring indicates that employee exposures are below the PEL and excursion limit (EL), monitoring may be discontinued.

5.4.6 Notification of Monitoring Results

Workers will be notified of exposure in writing either individually or by posting at a centrally located place that is accessible to affected workers as soon as possible but no later than five (5) working days after receipt of analytical results.

5.5 Engineering Controls and Work Practices

In addition to the general methods of compliance mentioned above, the following engineering controls and work practices and procedures will be used.

5.5.1 For all Class I jobs greater than 25 linear feet or 10 square feet of thermal system insulation (TSI) or surfacing material and for all other Class I jobs where a negative exposure assessment (NEA) is not available, one of the following methods will be used:

5.5.1.1 Critical barriers will be placed over all openings to the regulated area, except where activities are performed outdoors; or another barrier or isolation method which prevents the migration of ACM from the regulated area, as verified by perimeter area surveillance during each work shift at each boundary of the regulated area, showing no visible ACM dust; and perimeter area monitoring

showing that applicable clearance levels are met, or that perimeter area levels, measured by phase contrast microscopy (PCM) are no more than background levels represented by the same area before the asbestos abatement work began.

5.5.1.2 Heating, ventilation, air conditioning (HVAC) systems will be isolated in the regulated area by sealing with a double layer of 6 mil plastic.

5.5.1.3 Impermeable drop cloths will be placed on surfaces beneath all removal activity.

5.5.1.4 Objects within the regulated area will be covered with impermeable drop cloths or plastic sheeting which will be secured by duct tape.

5.5.1.5 If no negative exposure assessment (NEA) is available or where exposure monitoring indicates that a PEL is exceeded, the regulated area will be ventilated to move contaminated air away from the breathing zone of workers toward a HEPA filtration or collection device.

5.6 Class I Control Methods

5.6.1 Negative pressure enclosure (NPE) systems may be used where the configuration of the work area does not make the erection of the enclosure infeasible, with the following specifications and work practices:

5.6.1.1 At least 4 air changes per hour will be maintained in the NPE.

5.6.1.2 A minimum of –0.02 column inches of water pressure differential will be maintained within the NPE where feasible.

5.6.1.3 The NPE will be kept under negative pressure throughout the period of its use.

5.6.1.4 A back-up negative air machine will be on-site at all times.

5.6.1.5 Air movement will be directed away from employees performing asbestos work within the enclosure, and toward a HEPA filtration or a collection device.

5.6.1.6 Before beginning work within the enclosure and at the beginning of each shift, the NPE will be inspected for breaches any leaks will be sealed.

5.6.1.7 Electrical circuits in the enclosure will be deactivated, unless equipped with ground-fault circuit interrupters.

5.6.2 Glovebag systems may be used to remove PACM and/or ACM from straight runs of piping and elbows and other connections with the following specifications and work practices.

5.6.2.1 Glovebags will be made of 6 mil thick plastic and will be seamless at the bottom.

5.6.2.2 Each glovebag will be installed so that it completely covers the circumference of pipe or other structure where the work is to be done.

5.6.2.3 Glovebags will be smoke-tested for leaks and any leaks sealed prior to use.

5.6.2.4 Glovebags may be used only once and may not be moved.

5.6.2.5 Glovebags will not be used on surfaces whose temperature exceeds 150 degrees F.

5.6.2.6 Before beginning the abatement operations, loose and friable material adjacent to the glovebag/box operation will be wrapped and sealed in two layers of 6 mil plastic or otherwise made intact.

5.6.2.7 At least two persons will perform Class I glove bag removal operations.

5.6.2.8 The sides of the glovebag will be cut to fit the size of the pipe to be abated. Necessary tools should be placed in the glove bag, usually in a tool pocket fabricated within the bag.

5.6.2.9 The glovebag will be attached to the working area (pipe) by folding the open edges together and sealing with staples or tape. This area will be taped securely. The edges will be sealed of the glovebag to the working area with tape or adjustable straps to form a tight seal.

5.6.2.10 A small hole will be made in the lower half of the glovebag. A smoke tube will be inserted in the hole and the bag will be tested for a tight seal. The seal will be adjusted as necessary and retested until a tight seal is established. The smoke tester will be removed and the hole will be sealed with duct tape.

5.6.2.11 A small opening will be placed in the top side of the glovebag to allow for insertion of a wand (nozzle) from a portable sprayer or other water source. The opening will be taped to the sprayer nozzle to form a tight seal.

5.6.2.12 A second larger hole will be placed on the top opposite side from the water sprayer to allow insertion of a HEPA vacuum hose. The sliced area will be taped to the vacuum hose to form a tight seal. Once this has been done the HEPA vacuum can be turned on.

5.6.2.13 The workers' arms will be inserted into the sleeves of the glovebag, and, using the water sprayer, the worker will thoroughly wet the work area with water.

5.6.2.14 Hand tools will be used as necessary to remove the bands / wire holding the ACM to the pipe. The ACM will be lowered carefully to the bottom of glove bag. NOTE: Material will not be allowed to free fall as the weight may tear the glovebag.

5.6.2.15 The section of pipe covering that was removed will be thoroughly wetted using a sprayer with amended water.

5.6.2.16 Tools will be pulled through the sleeve of the glovebag. Twist the arm of bag and tie off with duct tape. This will create a bag to hold tools until such time as they can be cleaned.

5.6.2.17 The water sprayer will be removed, taking care to seal the slice with duct tape.

5.6.2.18 The HEPA vacuum will be turned on allowing air to be removed from bag. With air being removed, the bag should be squeezed tightly, as close to the top as possible and then twist sealed.

5.6.2.19 Turn off the HEPA vacuum and remove the hose, taking care to seal the slice with duct tape.

5.6.2.20 The glovebag is then cut and removed from the working area by being placed into a properly labeled, 6 mil outer bag and seal with duct tape in a gooseneck configuration (tape bag and fold half of taped area over upon itself and tape again forming what looks like a gooseneck).

5.6.2.21 When finished, encapsulant is sprayed on the exposed pipe.

5.6.3 Mini-Enclosures

5.6.3.1 The mini-enclosure can be of any configuration, but must be constructed to accommodate no more than two persons.

5.6.3.2 The enclosure must be constructed of 6 mil thick plastic sheeting or equivalent.

5.6.3.3 The mini-enclosure will be kept under negative pressure throughout the period of its use.

5.6.3.4 During use, air movement will be directed away from employees toward a HEPA filtration device.

5.6.4 Alternate Control Methods

Alternate control methods for Class I work may be performed using a control method which is not specified above or which modifies a method specified above if the following provisions are met:

5.6.4.1 The control method will enclose, contain or isolate the processes or source of airborne asbestos dust, or otherwise capture or redirect such dust before it enters the breathing zone of workers.

5.6.4.2 A Certified Industrial Hygienist or licensed Professional Engineer who is also qualified as a Project Designer will evaluate the work area, the projected work practices and engineering controls. After evaluating the area, that person will certify in writing that the planned control method is adequate to reduce direct and indirect employee exposure to below the PELs under worst case conditions of use, and that the planned control method will prevent asbestos contamination outside the regulated area, as measured by clearance sampling which meets the requirements of EPA's Asbestos in Schools rule issued under AHERA, or perimeter monitoring which meets the criteria in 29 CFR 1926.1101 (g)(4)(ii)(B)

5.6.4.3 Where the TSI or surfacing material to be removed is 25 linear or 10 square feet or less, the evaluation may be performed by a competent person, and may omit consideration of perimeter or clearance monitoring.

5.7 Class II Work Practices and Controls

5.7.1 All Class II work will be supervised by a competent person.

5.7.2 For all indoor Class II jobs, where a negative exposure assessment has not been performed or where during the job, changed conditions indicate there may be exposure above the PEL or where the ACM is not removed in a substantially intact state, one of the following methods to ensure that airborne asbestos does not migrate from the regulated area will be used:

5.7.2.1 Critical barriers will be placed over all openings to the regulated area.

5.7.2.2 Another barrier or isolation method will be used to prevent the migration of airborne asbestos from the regulated area. The effectiveness of this method may be verified by perimeter area monitoring or clearance monitoring which meets the criteria of 29 CFR 1926.1101(g)(4)(ii)(B).

5.7.2.3 Impermeable drop cloths will be placed on surfaces beneath removal activity.

5.7.3 Additional Controls for Class II Work

5.7.3.1 When glovebags are used, they will fully enclose the Class II material to be removed.

5.7.3.2 Vinyl and asphalt flooring materials which may contain asbestos will not be sanded.

5.7.3.3 Vacuums equipped with HEPA filters, disposable dust bags, and metal floor tools (no brushes) will be used to clean floors.

5.7.3.4 Resilient sheet flooring will be removed by cutting with wetting of the snip point and wetting during delamination. Rip-up of resilient sheet floor material will not be performed.

5.7.3.5 All scraping of residual adhesive will be performed using wet methods.

5.7.3.6 Dry sweeping will not be used.

5.7.3.7 Mechanical chipping is prohibited unless performed in a negative pressure enclosure.

5.7.3.8 Tiles will be removed intact, unless it is not feasible to do so.

5.7.3.9 Resilient sheet flooring material including associated mastic and backing are assumed to be ACM unless an Industrial Hygienist determines that it is asbestos free using recognized analytical techniques.

5.7.3.10 For removing ACM roofing material, the following work practices will be followed:

5.7.3.10.1 Roofing material will be removed in an intact state, if feasible.

5.7.3.10.2 Wet methods will be used to remove roofing materials that are not intact, or that will be rendered not intact during removal, unless wet methods are shown to be infeasible or create safety hazards.

5.7.3.10.3 Cutting machines will be continuously misted unless a competent person determines that misting substantially decreases worker safety.

5.7.3.10.4 When removing built-up-roofs with ACM roofing felts and an aggregate surface using a power roof cutter, all dust resulting from the cutting operation will be collected by a HEPA dust collector, or will be HEPA vacuumed by vacuuming along the cut line. For smooth surface (not containing aggregate) the still-wet dust may be gently swept and properly removed.

5.7.3.10.5 ACM that has been removed from a roof will not be dropped or thrown to the ground. Unless the material is carried or passed to the ground by hand, it will be lowered to the ground via covered, dust-tight chutes, cranes or hoists.

5.7.3.10.6 Any ACM that is not intact will be lowered to the ground as soon as practicable, but never later than the end of the work shift.

5.7.3.10.7 While the material remains on the roof it will be kept wet, placed in an impermeable waste bag, or wrapped in plastic sheeting.

5.7.3.10.8 Intact ACM will be lowered to the ground as soon as practicable, but no later than the end of the work shift.

5.7.3.10.9 Upon being lowered, unwrapped material will be transferred to a closed receptacle so that dust is not dispersed.

5.7.3.10.10 Roof level heating and ventilation air intake sources will be isolated or the ventilation systems shut down.

5.7.3.10.11 Removal or repair of sections of intact roofing less than 25 square feet in area does not require use of wet methods or HEPA vacuuming as long as manual methods which do not render the material non-intact and does not create visible dust by the removal method are used.

5.7.3.11 When removing cementitious asbestos containing siding and shingles or transite panels containing ACM on building exteriors, the following work practices will be followed:

5.7.3.11.1 Cutting, abrading or breaking siding, shingles, or transite panels, will be prohibited unless it is demonstrated that methods less likely to result in ACM release cannot be used.

5.7.3.11.2 Each panel or shingle will be sprayed with amended water (provided that the temperature is above freezing) prior to removal should the material be rendered non-intact.

5.7.3.11.3 Unwrapped or unbagged panels or shingles will be immediately lowered to the ground via covered dust-tight chute, crane or hoist, or placed in an impervious waste bag or wrapped in plastic sheeting and lowered to the ground no later than the end of the work shift.

5.7.3.11.4 Nails will be cut with flat, sharp instruments.

5.7.4 For Class II Removal of ACM for which no specific controls have been listed, the following work practices will be complied with:

5.7.4.1 The material will be thoroughly wetted with amended water prior to and during its removal.

5.7.4.2 The material will be removed in an intact state unless intact removal is not feasible.

5.7.4.3 Cutting, abrading or breaking the material will be prohibited unless it is demonstrated that methods less likely to result in ACM fiber release are not feasible.

5.7.4.4 ACM material will be immediately bagged or wrapped, or kept wetted until transferred to a closed receptacle, no later that the end of the work shift.

5.7.5 Alternative Work Practices and Controls

5.7.5.1 Instead of the work practices and controls above, different or modified engineering and work practice controls may be used if the following provisions are complied with:

5.7.5.1.1 It can be demonstrated by data representing employee exposure during the use of such method under conditions which closely resemble the conditions under which the method is to be used, that worker exposure will not exceed the PELs under any anticipated circumstances.

5.7.5.1.2 A competent person will evaluate the work area, the project work practices and the engineering controls.

5.7.5.1.3 The competent person will certify, in writing, that the different or modified controls are adequate to reduce direct and indirect worker exposure to below the PELs under all expected conditions of use and that the method meets the requirements of the OSHA standard.

5.7.5.1.4 The evaluation will include and be based on data representing worker exposure during the use of such method under conditions which closely resemble the conditions under which the method is to be used for the current job, and by workers whose training and experience are equivalent to employees who are to perform the current job.

5.8 Work Practices and Engineering Controls for Class III Asbestos Work.

5.8.1 Class III asbestos work will be conducted using engineering and work practice controls which minimize the exposure to employees performing the asbestos work and to bystander employees.

5.8.2 The work will be performed using wet methods.

5.8.3 To the extent feasible, the work will be performed using local exhaust ventilation.

5.8.4 Where the disturbances involve drilling, cutting, abrading, sanding, chipping, breaking or sawing of thermal system insulation (TSI) or surfacing material, impermeable drop cloths will be used, and will isolate the operation using mini-enclosures or glovebag systems or other isolation methods.

5.8.5 Where no negative exposure assessment is provided, or where monitoring results show the PEL has been exceeded, the areas using impermeable drop cloths and plastic barriers or their equivalents will isolate the operation.

5.8.6 Workers performing Class III jobs, which involve the disturbance of thermal system insulation (TSI) or surfacing material, or where no negative exposure assessment (NEA) has been provided, or where monitoring results show a PEL has been exceeded, will wear approved respirators.

5.9 Work Practices and Engineering Controls for Class IV Asbestos Work.

5.9.1 Class IV ACM jobs will be conducted using wet methods, HEPA vacuums, and prompt clean up of debris containing ACM or PACM.

5.10 Alternative Methods of Compliance for Installation, Removal, Repair, and Maintenance of Certain Roofing and Pipeline Coating Materials.

5.10.1 Before work begins and as needed during the job, a competent person will select the appropriate control strategy.

5.10.2 Material will not be sanded, abraded, or ground. Manual methods which render the material non-intact will not be used.

5.10.3 Material which has been removed from a roof will not be dropped or thrown to the ground. Unless the material is carried or passed to the ground by hand, it will be lowered to the ground via covered, dust-tight chute, crane or hoist. All such material will be removed from the roof as soon as practicable, but not later than the end of the work shift.

5.10.4 All removal or disturbance of asbestos containing pipeline asphaltic wrap will be performed using wet methods.

5.11 Respiratory Protection

Respirators will be used and worn in accordance with Brandenburg's Respiratory Protection Program (See procedure 2.01).

5.11.1 Respirators must be worn during:

5.11.1.1 Class I asbestos work.

5.11.1.2 Class II asbestos work that is not performed using wet methods, except for removal of ACM from sloped roofs when a negative-exposure assessment (NEA) has been conducted and ACM is removed in an intact state.

5.11.1.3 Class II and III asbestos work for which a negative-exposure assessment (NEA) has not been conducted.

5.11.1.4 Class III asbestos work when TSI or surfacing ACM or PACM is being disturbed.

5.11.1.5 Class IV asbestos work performed within regulated areas where employees who are performing other work are required to use respirators.

5.11.1.6 Work operations in which employees are exposed over the TWA or excursion limit.

5.11.1.7 Emergencies.

5.12 Protective Clothing

5.12.1 Any worker potentially exposed to airborne concentrations of asbestos at or above the PEL or excursion limits (EL) are required to wear coveralls or similar whole body protection, head covering, gloves, and foot coverings. Protective clothing is also required for jobs in which a negative exposure assessment (NEA) is required but is not available, or for any worker performing Class I operations which involve the removal of over 25 linear or 10 square feet of TSI or surfacing ACM and PACM.

5.12.2 Brandenburg will use disposable clothing whenever possible. However, should disposable clothing not be utilized, contaminated clothing will be professionally laundered so as to prevent the release of airborne asbestos in excess of the PEL or excursion limit (EL). The launderer will be informed of the clothing contents so that prevention of airborne asbestos fibers in excess of limits can be attained.

5.12.3 Contaminated clothing will be transported in sealed impermeable bags, or other closed impermeable containers, and labeled in accordance with current regulations.

5.12.4 Inspection of Protective Clothing

5.12.4.1 The competent person will examine worksuits worn by employees at least once per work-shift for rips or tears that may have occurred during performance of work.

5.12.4.2 When rips or tears are detected while an employee is working, rips and tears will be immediately mended or the worksuit will be immediately replaced.

5.13 Hygiene Facilities and Practices for Employees

5.13.1 Requirement for Class I asbestos jobs involving over 25 linear or 10 square feet of TSI or surfacing ACM and PACM.

5.13.1.1 Decontamination Areas

The decontamination area will be adjacent and connected to the regulated area for the decontamination of such workers. The decontamination area will consist of an equipment room, shower area, and clean room in series. Workers must enter and exit the regulated area through the decontamination area.

5.13.1.2 Equipment Room

The equipment room will be supplied with impermeable, labeled bags and containers for the containment and disposal of contaminated protective equipment.

5.13.1.3 Shower area.

Shower facilities will be adjacent both to the equipment room and the clean room, unless it can be demonstrated that this location is not feasible. Where it is not feasible to locate the shower between the equipment room and the clean room or where the work is performed outdoors workers must:

5.13.1.3.1 Remove asbestos contamination from their worksuits in the equipment room using a HEPA vacuum before proceeding to a shower that is not adjacent to the work area, or

5.13.1.3.2 Remove their contaminated worksuits in the equipment room, then don clean worksuits, and proceed to a shower that is not adjacent to the work area, or

5.13.1.3.3 Have donned double Tyvek suits prior to the onset of the work, and remove the outer suit before proceeding to a shower that is not adjacent to the work area.

5.13.1.4 Clean Change Room

The clean room will be equipped with a locker or appropriate storage container for each worker's use. When it can be demonstrated that it is not feasible to provide a clean change area adjacent to the work area or where the work is performed outdoors, workers may be permitted to clean their protective clothing with a portable HEPA equipped vacuum before such employees leave the regulated area.

5.13.1.5 Decontamination Area Entry Procedures

5.13.1.5.1 Enter the decontamination area through the clean room.

5.13.1.5.2 Remove and deposit street clothing within a designated area.

5.13.1.5.3 Put on protective clothing and respirator protection before leaving the clean room.

5.13.1.5.4 Before entering the regulated area, workers must pass through the equipment room.

5.13.1.6 Decontamination Area Exit Procedures

5.13.1.6.1 Before leaving the regulated area, employees will remove all gross contamination and debris from their protective clothing.

5.13.1.6.2 Workers will remove their protective clothing in the equipment room and deposit the clothing in labeled impermeable bags or containers.

5.13.1.6.3 Workers will not remove their respirator in the equipment room.

5.13.1.6.4 Workers will shower prior to entering the clean room.

5.13.1.6.5 Workers will remove their respirators while showering.

5.13.1.6.6 After showering workers will enter the clean room before changing into street clothes.

5.13.1.7 Lunch Areas

Workers are required to eat their lunch in an area provided where the airborne concentration of asbestos fibers are below the PEL and excursion limit (EL). Workers cannot eat in regulated areas.

5.13.2 Requirements for Class I work involving less that 25 linear or 10 square feet of TSI or surfacing ACM and PACM, and for Class II and Class III asbestos work operations where exposures exceed the PEL or where there is no negative exposure assessment (NEA) produced before the operation.

5.13.2.1 An equipment room or area that is adjacent to the regulated area for the decontamination of employees and their equipment which is contaminated with asbestos will consist of an area covered by a impermeable drop cloth on the floor or horizontal working surface.

5.13.2.2 Work clothing must be cleaned with a HEPA vacuum before it is removed.

5.13.2.3 All equipment and surfaces of containers filled with ACM must be cleaned prior to removing them from the equipment room or area.

5.13.3 Requirements for Class IV work

5.13.3.1 Workers performing Class IV work within a regulated area must comply with the same hygiene practices required of workers performing work which has a high classification (Class I, II or III as applicable) within that regulated area.

5.13.3.2 Workers will not smoke, eat, drink, chew tobacco or gum, or apply cosmetics in the regulated area.

5.14 Disposal

5.14.1 Labels will be affixed to all products containing asbestos and to all containers containing such products, including waste containers. Where feasible, installed asbestos products shall contain a visible label.

5.14.2 Labels will be printed in large, bold letters on a contrasting background.

5.14.3 Labels will contain the following information:

DANGER

CONTAINS ASBESTOS FIBERS

AVOID CREATING DUST

CANCER AND LUNG DISEASE HAZARD

5.14.4 Materials will be stored in leak tight containers.

5.14.5 All shipments will be tracked using a 4-part waste manifest, as required by 40 CFR 61 (NESHAP)

5.14.6 Containers will contain a layer of 6 mil poly.

5.14.7 All materials will be disposed of at an approved subtitled D asbestos landfill.

5.15 Employee Information and training

5.15.1 Any worker performing removal activities or disturbing ACM will be trained.

5.15.2 Training will be provided prior to or at the time of initial assignment and at least annually thereafter.

5.15.3 Training for Class I operations and for Class II operations that require the use of critical barriers (or equivalent isolation methods) and/or negative pressure enclosures will be the equivalent in curriculum, training method and length to the EPA Model Accreditation Plan (MAP) asbestos abatement workers training.

5.15.4 Training for other Class II work.

5.15.4.1 For work with asbestos containing roofing materials, flooring materials, siding materials ceiling tiles, or transite panels, training will be similar to Class I required training above and will be for at least 8 hours.

5.15.4.2 Any worker who works with more than one of the categories of material will receive training in the work practices applicable to each category of material that the employee removes and each removal method that the employee uses.

5.15.4.3 Training for Class II employees will be consistent with EPA requirements for training of local education agency maintenance and custodial staff. Such a course will also include “hands-on” training and will take at least 16 hours.

5.15.5 Training records will be kept for three years beyond the last date of the worker’s employment.

5.15.6 Brandenburg will insure employees have State licenses for asbestos work where State licensure is required.

5.16 Visual Inspection for Final Clearance

Prior to performing demolition or a finding that the work has been completed, a visual inspection will be performed. Brandenburg’s competent person will perform this visual inspection and either confirm that the work has been properly completed or point out areas in need of further work.

5.17 Final Clearance Sampling Requirements

Final clearance sampling requirements will vary from site to site. State and local requirements will vary along with the circumstances requiring clearance sampling.

6. Forms

6.1 Waste Shipment Record (WSR)

6.2 NESHAPS Notification of Demolition / Renovation

6.3 Negative Exposure Assessment (Industrial Hygiene Data Form, (SAF-42A-E)

6.4 Foreman’s Daily Report (ENV-24)

6.5 Abatement Supply and Equipment Checklist (ENV-21)

6.6 Abatement Sign In. Sign Out Sheet (ENV-22)

6.7 Asbestos Exposure Notification Form (SAF-56)

6.8 Final Visual Inspection Form (ENV-27)

6.9 Asbestos Waiver of Liability - Regulated Area, (SAF-32)

7. Regulatory / Permit Requirements

29 CFR 1926.1101

40 CFR 61

Other potential state and local notifications.

8. Record Keeping

Air monitoring records are maintained per Records Retention Form, QUA-05.Employee training records and medical records are maintained in accordance with Medical Surveillance Policy 1.12 and per Employee Files, SOP and Records Retention Form, QUA-05. All other project-specific documents are retained in the project file and per Records Retention Form, QUA-05.

Title	Date	Reference	Area
PCB's	**7/23/2012**	**5.05**	**Safety**

1. Summary

Certain projects may require that workers handle, or come into contact with oil filled equipment (OFE) or materials that contain polychlorinated biphenyls (PCBs). This procedure provides general requirements for the safe handling of PCB fluids, PCB equipment and PCB contaminated material.

2. Scope

All applicable Brandenburg personnel and work sites will be outlined within this procedure as required

3. Definitions

3.1 PCBs – Any chemical substance that is limited to the biphenyl molecule that has been chlorinated to varying degrees or any combination of substances which contains such substance. Common trade names for PCBs include: Aroclor, Aroclor B, Abestol, Askerel, Adkarel, Chlorextol, Chlorinol, Clorphen, Diaclor, Dykanol, Elemex, Eucarel, Hyvol, Inerteen, No-Flamol, Pyranol, Pyroclor, Saf-T-Kuhl, Sanotherm.

3.2 PCB Contaminated – Materials that contain a concentration of PCB equal to or greater than 50 ppm but less than 500 ppm. In the absence of liquids, a non-porous surface having a surface concentration >10 ug/100 cm^2 but < 100 ug/100 cm^2, as measured by a standard wipe test.

4. Responsibility

Responsibility of personnel will be outlined within this procedure as required

5. Methods

5.1 Hazard Assessments

5.1.1 A hazard assessment will take place prior to the inception of site work activity involving potential PCB exposures. This hazard assessment may be documented in the Engineering Survey, safety survey, site-specific Health and Safety Plan (HASP), a Task Safety Analysis (TSA), or other similar document.

5.2 Exposure Assessments

5.2.1 Sources of employee exposure to airborne PCBs may include torch cutting or demolition of PCB contaminated materials. Brandenburg may perform personal sampling of employees to determine worker exposure to airborne PCBs where a reasonable potential for exposure exists.

5.3 Medical Evaluations

5.3.1 Personnel assigned to work on projects involving extensive PCB handling and/or significant exposure potential may be required to complete PCB specific medical surveillance.

5.4 Safe Handling

The following methods will be adhered to when handling all electrical OFE including but not limited to transformers, capacitors, motors, ballasts, and circuit breakers which contain, or previously contained PCB materials.

5.4.1 Before handling any electrical OFE, electrical service will be disconnected and tested in accordance with the proper utility disconnect procedures.

5.4.2 In operations where workers may come into direct contact with PCB-contaminated or potentially PCB-contaminated material, such as draining large transformers and similar equipment, workers will be required to wear proper personal protective equipment (PPE) including but not limited to disposable coveralls, gloves, shoe coverlets, face shields, goggles, and respirators.

5.4.3 Workers exposed to airborne PCBs via the inhalation route may be required to wear respiratory protection. The type of respiratory protection will be specified in the hazard assessment.

5.4.4 Light water misting may be used during demolition of PCB contaminated material in a manner to control dust emissions while not allowing water to pool or flow.

5.4.5 Proper drums and similar containment shall be used, properly marked and labeled.

5.4.6 Equipment shall not be containerized or collected until characterized for PCB content.

5.5 Spill Management

5.5.1 During the course of draining, transferring, and moving vessels that contain PCB fluid, proper precautions will be followed to eliminate the possibility of accidents resulting in spills or contamination of the environment. These precautions may include but are not limited to: the use of drip pans, availability of spill kits, availability of sufficient absorbent materials and equipment to clean up any spill.

5.5.2 All drains, manholes, and other openings which may lead to waterways will be covered and sealed in a manner to prevent any migration of the contaminants.

5.6 Training

5.6.1 All personnel handling PCB-contaminated or potentially PCB-contaminated oil shall be trained in the proper handling procedures and in accordance with the OSHA Hazard Communication Standard (29 CFR 1910.1200).

6. Forms

None

7. Regulatory / Permit Requirements

40 CFR 761 (U.S. EPA)

8. Record Keeping

Air monitoring records are maintained per Records Retention Form, QUA-05. Employee medical and training records are maintained per Employee Files, SOP and Records Retention Form, QUA-05.

Title	Date	Reference	Area
Bloodborne Pathogens	**7/23/2012**	**5.06**	**Safety**

1. Summary

Workers may be at risk of contracting infectious diseases each time they are exposed to bloodborne pathogens. Any exposure incident may result in infection and subsequent illness. Since it is possible to become infected from a single exposure incident, it is Brandenburg's policy to prevent exposure incidents whenever possible.

2. Scope

All applicable Brandenburg personnel and work sites will be outlined within this procedure as required

3. Definitions

3.1 Bloodborne Pathogens - Pathogenic microorganisms that are present in human blood and can cause disease in humans. These pathogens include, but are not limited to, hepatitis B virus (HBV) and human immunodeficiency virus (HIV).

3.2 Engineering Controls - Controls (e.g., sharps disposal containers, self-sheathing needles, safer medical devices, such as sharps with engineered sharps injury protections and needleless systems) that isolate or remove the bloodborne pathogens hazard from the workplace.

3.3 Universal Precautions - An approach to infection control. According to the concept of Universal Precautions, all human blood and certain human body fluids are treated as if known to be infectious for HIV, HBV, and other bloodborne pathogens.

3.4 Work Practice Controls - Controls that reduce the likelihood of exposure by altering the manner in which a task is performed (e.g., prohibiting recapping of needles by a two-handed technique).

3.5 Occupational Exposure - Reasonably anticipated skin, eye, mucous membrane, or parenteral contact with blood or other potentially infectious materials that may result from the performance of an employee's duties.

4. Responsibility

Responsibility of personnel will be outlined within this procedure as required

5. Methods

5.1 Hazard Assessment

5.1.1 Hazard Assessments

5.1.1.1 A hazard assessment will take place prior to the inception of site work activity. This hazard assessment may be documented as part of the Engineering Survey, site-specific Health and Safety Plan (HASP), a Task Safety Analysis (TSA), and/or in another similar document.

5.1.1.2 Sources of bloodborne pathogens vary among projects but, in general, can be found in landfills or dumps containing medical waste, hospital buildings, dumpsters, waste boxes, or any location which may have contained materials or

articles which have contacted body fluids. This might include: used syringes, sewer piping, or vessels which have contained human waste or excrement.

5.1.1.3 Sources of employee exposure can vary but usually will involve activities such as handling, storing, or otherwise working with or around materials as mentioned above.

5.2 Methods of Compliance

5.2.1 Brandenburg will observe “Universal Precautions” to prevent contact with blood, body fluids and other potentially infectious materials.

5.2.2 Personal protective equipment (PPE), work practice controls, and engineering controls are to be implemented at all times by all workers who are assigned to handle bloodborne pathogenic materials. These controls will be used to eliminate or minimize employee exposure to potential infectious materials.

5.3 Work Practices

5.3.1 Personal Hygiene

5.3.1.1 Employees are expected to utilize good hygienic practices at all times. During activities involving bloodborne pathogens, a heightened awareness toward personal hygiene will be required.

5.3.1.2 Eating, drinking, gum chewing, tobacco chewing, smoking, cosmetic application, application of balms or medications, or any activity which increases the potential for hand to mouth, mucous membrane or skin contact is strictly prohibited during all work involving the handling of potentially infectious materials.

5.3.1.3 Food, drink, medications, chewing gum, cigarettes, tobacco or smoking equipment, chewing tobacco, PPE articles of clothing, shoes, eye glasses and similar items shall not be stored in refrigerators, freezers, shelves, cabinets or on counter tops where blood or other potentially infectious materials are present or stored.

5.3.1.4 Handwashing facilities will be provided when feasible. When hand washing facilities are not feasible, an appropriate antiseptic hand cleanser or antiseptic towelette will be provided. When antiseptic hand cleansers or towelettes are used, hands shall be washed with soap and running water as soon as feasible

5.3.1.5 All employees will routinely wash their hands and any other exposed skin promptly with a disinfectant soap and water after removal of gloves or other PPE or following any contact with potentially infectious materials.

5.3.1.6 All employees will wash their hands and any other exposed skin before eating, urinating, defecating, applying make-up, smoking, or undertaking any activity which may result in increased potential for hand to mouth, mucous membrane or skin contact.

5.3.1.7 A changing area will be established to keep employee PPE away from the employee lunch / break area.

5.3.1.8 All employees will conduct themselves in a manner that will minimize the potential for accidental contact with potentially infectious materials.

5.4 Engineering Controls

5.4.1 Specimens of blood or other potentially infectious materials shall be placed in a labeled container which prevents leakage during collection, handling, processing, storage, transport, or shipping.

5.4.2 Potentially infectious sharps and glassware which are not packaged properly will be handled utilizing tongs, dust pan, brush or scoops and shovels. Under no circumstances will sharps and glassware be handled directly by hand.

5.4.3 To reduce the accidental spread of infectious substances by workers from the contaminated area to the clean area, work zones will be delineated where different types of operations will occur, and the flow of personnel can be controlled.

5.5 Personal Protective Equipment (PPE)

5.5.1 The selection of PPE depends on the quantity and type of exposure expected. Specific PPE requirements will be included in the hazard assessment documentation. PPE may be upgraded at any time to improve employee protection.

5.5.2 When there is occupational exposure, appropriate PPE such as, but not limited to, gloves, gowns, laboratory coats, face shields or masks and eye protection, and mouthpieces, resuscitation bags, pocket masks, or other ventilation devices will be provided and worn.

5.5.3 Gloves shall be worn when it can be reasonably anticipated that the employee may have hand contact with blood, other potentially infectious materials, mucous membranes, and non-intact skin; and when handling or touching contaminated items or surfaces.

5.5.4 Disposable (single use) gloves such as surgical or examination gloves shall be replaced as soon as practical when contaminated or as soon as feasible if they are torn, punctured, or when their ability to function as a barrier is compromised.

5.5.5 Masks in combination with eye protection devices, such as goggles or glasses with solid side shields, or chin-length face shields, shall be worn whenever splashes, spray, spatter, or droplets of blood or other potentially infectious materials may be generated and eye, nose, or mouth contamination can be reasonably anticipated.

5.5.6 Appropriate protective clothing such as, but not limited to, gowns, aprons, lab coats, clinic jackets, or similar outer garments shall be worn in occupational exposure situations. The type and characteristics will depend upon the task and degree of exposure anticipated.

5.5.7 All used personal protective equipment will be disposed of properly based on the potentially infectious nature of the contamination.

5.6 Incident Management

5.6.1 Should materials be discovered such as used needles, syringes, materials soaked with blood, body fluids, or human excrement, the worker must avoid the area, warn others in the area regarding the potential hazard, and notify the area Supervisor.

5.6.2 Brandenburg workers will not remove or dispose of bloodborne pathogenic waste. Instead, Brandenburg will hire a trained and qualified subcontractor to remove and dispose of wastes potentially possessing a bloodborne pathogenic hazard.

5.6.3 If there is a reasonable cause to believe that a potential exposure to blood or other potentially infectious materials has been experienced, then the employee must do the following:

5.6.3.1 Immediately notify the Supervisor.

5.6.3.2 Wash area of contamination and immediately remove any contaminated clothing.

5.6.4 The exposed employee will receive a confidential medical examination and follow up that will include the requirements outlined in 29 CFR 1910.1030(f)(3).

5.6.5 The physician will provide the employee with a written opinion that states the employee has been informed of the results of the evaluation and a recommendation for further evaluation or treatment. A copy of this opinion will be provided to the worker by the medical provider within 15 days.

5.7 Medical Monitoring

5.7.1 All Brandenburg employees assigned to work with potentially infectious materials will be required to continue to submit to routine physical examinations as required in the Brandenburg Medical Surveillance Procedure (1.12). Additional, specific requirements for employees working with potentially infectious materials are set forth below.

5.7.2 In general, Brandenburg shall make available the hepatitis B vaccine and vaccination series to all employees who have occupational exposure, and post-exposure evaluation and follow-up to all employees who have had an exposure incident.

5.8 Training

5.8.1 Brandenburg shall train each employee with occupational exposure in accordance with the requirements of 29 CFR 1910.1030 (Bloodborne Pathogens Standard). Training shall be completed at the time of initial assignment to tasks where occupational exposure may take place and at least annually thereafter.

6. Forms

None

7. Regulatory / Permit Requirements

29 CFR 1910.1030

8. Record Keeping

Employee medical and training records are maintained per Employee Files, SOP and Records Retention Form, QUA-05.

Title	Date	Reference	Area
Radioactive Materials	**7/23/2012**	**5.07**	**Safety**

1. Summary

This procedure provides guidance on work methods to be implemented to protect employees from potential hazards associated with radioactive materials. The main sources of radioactive material may include but are not limited to: sealed radioactive material, low level radioactive contaminated material, Naturally Occurring Radioactive Material (NORM), Technologically Enhanced Naturally Occurring Radioactive Material (TENORM), scrap contaminated with radioactive material or inherently radioactive scrap. Workers who are expected to handle or work with radioactive materials will be properly trained, qualified and protected.

2. Scope

All applicable Brandenburg personnel and work sites will be outlined within this procedure as required

3. Definitions

3.1 ALARA – An acronym for "as low as (is) reasonably achievable," which means making every reasonable effort to maintain exposures to ionizing radiation as far below the dose limits as practical

3.2 NORM – An acronym for Naturally Occurring Radioactive Material. Materials which naturally contain small amounts of uranium, thorium, and a radioactive isotope of potassium. Examples of naturally-occurring radionuclides are uranium, radon gas, and carbon-14.

3.3 TENORM – An acronym for Technologically Enhanced Naturally Occurring Radioactive Material. This includes any naturally occurring material not subject to regulation under the Atomic Energy Act whose radionuclide concentrations or potential for human exposure have been increased above levels encountered in the natural state by human activities. TENORM is produced when activities such as uranium mining, or sewage sludge treatment, concentrate or expose radioactive materials that occur naturally in ores, soils, water, or other natural materials.

3.4 Radioactive Material – Any material which emits, by spontaneous nuclear disintegration, corpuscular or electromagnetic emanations.

3.5 Restricted Area - Any area to which access is controlled by the employer for purposes of protection of individuals from exposure to radiation or radioactive materials.

3.6 Radiation Area - Any area, accessible to personnel, in which there exists radiation at such levels that a major portion of the body could receive in any one (1) hour a dose in excess of 5 millirem, or in any 5 consecutive days a dose in excess of 100 millirem; and any area, accessible to personnel, in which there exists radiation at such levels that a major portion of the body could receive in any one (1) hour a dose in excess of 100 millirem (High Radiation Area).

3.7 Contamination - The deposition of unwanted radioactive material on the surfaces of structures, areas, objects or personnel.

3.8 Inherently Radioactive Scrap - Material in which radioactivity has become an inseparable part. Examples may include: metals and alloys which are made radioactive in a reactor or particle accelerator, uranium metal counterweights, masonry containing radioactivity, alloys used in wire, glass, ceramics, and certain combinations of aluminum, magnesium, and nickel which contain radioactivity.

3.9 Sealed Radioactive Material - Material which contains a specific amount of radioactive material in a sealed component. These may include sealed housings of gauges, medical equipment, and electrical components such as transformers with lightning arrestors.

3.10 Scrap Contaminated with Radioactive Material - Material with radioactive material adhering to the surface. Contamination can either be solid or liquid. The source could be from a leaking discrete radioactive source, residues from spills, or from other radioactive sources.

4. Responsibility

Responsibility of personnel will be outlined within this procedure as required

5. Methods

5.1 Hazard Assessment

A hazard assessment will take place prior to the inception of site work activity. This hazard assessment may be documented in the Engineering Survey, safety survey, Radiological Health and Safety Plan (RHASP), site-specific Health & Safety Plan (HASP), or in the form of a Task Safety Analysis (TSA).

Should workers notice any signs indicating a radiation hazard or what appears to be a radiation source, they are instructed to avoid the area, warn others, and immediately inform the Supervisor to further assess the situation.

5.2 Plans

A Radiological Health and Safety Plan (RHASP) will be written by a Health Physicist as necessary in order to minimize and prevent exposures to radioactive materials. In addition, a site-specific Health & Safety Plan (HASP) will be written to address general safety measures.

5.3 Signs and Labels

Each radiation area shall be conspicuously posted with a sign or signs bearing the radiation caution symbol and the words:

CAUTION

RADIATION AREA

Each high radiation area shall be conspicuously posted with a sign or signs bearing the radiation caution symbol and the words:

CAUTION

HIGH RADIATION AREA

5.4 Exposure Assessments

Personal dosimetry is required for any employee who, while on-the-job, enters a restricted area under such circumstances that he receives, or is likely to receive, a dose in any calendar quarter in excess of 25% of the limits in 29 CFR 1910.1096(b)(1) and each employee who enters a high radiation area.

5.5 Radioactivity Assessments

Environmental monitoring of the work areas and contamination monitoring of workers and equipment will be performed in accordance with the Radiological Health & Safety Plan (RHASP).

5.6 Control Measures

While handling radioactive materials, Brandenburg will minimize work place exposures to ALARA levels through the application of the three main principles: **TIME**, **DISTANCE**, and **SHIELDING**.

5.6.1 **TIME**: Any dose imparted on the worker is time dependent and is incorporated into the dose-rate. Time spent in relationship to sources of ionizing radiation shall be limited as practicable in order to perform the required task. Tasks will be planned so as to limit stay time. Workers who are not immediately engaged in the handling of radioactive materials will remain in pre-determined “low dose” or “no dose” areas.

5.6.2 **DISTANCE**: Distance will be considered during the planning stages of each job. Workers will use designated routes for ingress and egress to work and when working in areas where the distance to radiation has been taken into consideration and ALARA principles have been utilized.

5.6.3 **SHIELDING**: Shielding is used to attenuate or stop a dose from being imparted on a worker. Shielding may consist of enclosures constructed of lead, concrete, or other materials that will lessen the impact or otherwise be used to protect workers from radiation.

5.7 Training

5.7.1 All individuals working in or frequenting any portion of a radiation area shall be

5.7.1.1 Informed of the occurrence of radioactive materials or of radiation in such portions of the radiation area;

5.7.1.2 Instructed in the safety problems associated with exposure to such materials or radiation and in precautions or devices to minimize exposure;

5.7.1.3 Instructed in the applicable provisions of this section for the protection of employees from exposure to radiation or radioactive materials; and

5.7.1.4 Advised of reports of radiation exposure which employees may request pursuant to the regulations in this section.

5.7.2 All Brandenburg employees will attend a Brandenburg Site Safety Orientation prior to starting work and/or receiving un-escorted access to the site. Brandenburg's orientation shall include a review of the contents of the RHASP and HASP.

6. Forms

None

7. Regulatory / Permit Requirements

29 CFR 1910.1096

8. Record Keeping

Air monitoring records are maintained per Records Retention Form, QUA-05. Employee medical and training records are maintained per Employee Files, SOP and Records Retention Form, QUA-05.

Title	Date	Reference	Area
Inorganic Arsenic	**7/23/2012**	**5.08**	**Safety**

1. Summary

This policy has been developed to protect workers from inorganic arsenic overexposure. There are a variety of work activities when Brandenburg workers may be exposed to inorganic arsenic. These activities may include: welding, torch cutting mechanical demolition of structures and/or excavation of contaminated soils.

2. Scope

All applicable Brandenburg personnel and work sites will be outlined within this procedure as required

3. Definitions

3.1 Action Level (AL) - Employee exposure, without regard to the use of respirators, to an airborne concentration of inorganic arsenic of 5.0 micrograms per cubic meter of air (5 $\mu g/m^{3)}$ calculated as an 8 hour time weighted average (TWA).

3.2 Arsenic – A highly toxic, naturally occurring element found in the earth's surface. Copper acetoarsenite, arsenic and all inorganic compounds containing arsenic except arsine, measured as arsenic (As).

3.3 Permissible Exposure Limit (PEL) - The maximum level of inorganic arsenic in the air to which an employee may be exposed over an 8 hour work day. The PEL for arsenic is 10 micrograms per cubic meter (10 $\mu g/m^{3}$) calculated as an 8 hour time weighted average (TWA).

4. Responsibility

Responsibility of personnel will be outlined within this procedure as required

5. Methods

5.1 Assessments

5.1.1 Hazard Assessments

5.1.1.1 A hazard assessment will take place prior to the inception of site work activity involving potential inorganic arsenic exposures. This hazard assessment may be documented in the Engineering Survey, safety survey, site-specific Health and Safety Plan (HASP), a Task Safety Analysis (TSA), or other similar document.

5.1.2 Exposure Assessments

Determinations of airborne exposure levels shall be made from air samples that are representative of each employee's exposure to inorganic arsenic over an eight (8) hour period.

5.2 Air Monitoring Program

5.2.1 Full shift (for at least 7 continuous hours) personal samples shall be collected including at least one sample for each shift for each job classification in each work area

5.2.2 If the initial monitoring reveals employee exposure to be below the action level the measurements need not be repeated except when there has been a production, process, control or personal change which may result in new or additional exposure to inorganic arsenic.

5.2.3 If the initial monitoring or subsequent monitoring reveals employee exposure to be above the permissible exposure limit (PEL), the employer shall repeat monitoring at least quarterly.

5.2.4 If the initial monitoring or subsequent monitoring reveals employee exposure to be above the action level (AL) and below the permissible exposure limit (PEL) the employer shall repeat monitoring at least every six (6) months.

5.2.5 Monitoring may be increased if:

5.2.5.1 There have been worker complaints of symptoms, which may be attributable to inorganic arsenic exposure.

5.2.5.2 Other information or observations indicate worker overexposure.

5.2.5.3 There has been a production, process, control or personal change which may result in new or additional exposure to inorganic arsenic

5.2.6 Monitoring may be discontinued if worker exposure is below the action level for two (2) consecutive measurements taken at least seven (7) days apart.

5.3 Analytical Results

5.3.1 Within 15 working days after the receipt of the monitoring results, each affected employee will be notified of the results either individually in writing using the Inorganic Arsenic Exposure Notification form (SAF-33 A) or by posting the results in an appropriate location that is accessible to affected employees.

5.3.2 Whenever the results indicate that the representative employee exposure exceeds the PEL, the written notice shall include a statement that the PEL was exceeded and a description of the corrective action taken to reduce exposure to or below the PEL.

5.4 Control Methods

5.4.1 Engineering Controls and Work Practices

Brandenburg will institute engineering and work practice controls to reduce and maintain employee exposure to arsenic at or below the PEL to the extent feasible.

Where engineering and work practice controls are not sufficient to reduce exposures to or below the PEL, they shall nonetheless be used to reduce exposures to the lowest levels achievable by these controls and shall be supplemented by the use of respirators and other necessary personal protective equipment (PPE). Employee rotation is not required as a control strategy before respiratory protection is instituted.

5.4.2 Respiratory Program

Respiratory protection will be used, in combination with engineering controls and work practices, to maintain employee airborne inorganic arsenic exposures below the PEL during: periods necessary to install or implement feasible engineering or work-practice controls, work operations where engineering and work-practice controls are not feasible, work operations for which engineering and work-practice controls are not yet sufficient to reduce employee exposures to or below the PEL, and emergencies. Respiratory protection for airborne inorganic arsenic will correspond to the airborne inorganic arsenic concentrations as follows:

5.4.2.1 Half mask air-purifying respirator equipped with P100 filters and acid gas cartridges when the inorganic arsenic concentration is at or below 100 $\mu g/m^3$;

5.4.2.2 Full face piece supplied-air respirators when the inorganic arsenic concentration is at 100 $\mu g/m^3$ or below 500 $\mu g/m^3$.

5.4.3 Personal Protective Clothing and Equipment

5.4.3.1 Brandenburg will provide protective equipment to employees and will ensure its use where the possibility of skin or eye irritation from inorganic arsenic exists, and for all workers working in regulated areas. Equipment varies by task and may include but is not limited to: coveralls; gloves; hardhats; shoe coverlets; face shields; goggles.

5.4.3.2 Brandenburg shall provide protective clothing in a freshly laundered and dry condition at least weekly, and daily if the employee works in areas where exposures are over 100 ug/m^3 of inorganic arsenic or in areas where more frequent washing is needed to prevent skin irritation.

5.4.3.3 Workers are specifically prohibited from removing inorganic arsenic contaminated dust from clothing by blowing or shaking.

5.4.4 Housekeeping / Hygiene Facilities

5.4.4.1 All surfaces shall be maintained as free as practicable of accumulations of inorganic arsenic.

5.4.4.2 Floors and other accessible surfaces contaminated with inorganic arsenic may not be cleaned by the use of compressed air. Shoveling and brushing may be used only where vacuuming or other relevant methods have been tried and found not to be effective.

5.4.4.3 Clean change rooms will be provided at all jobs where inorganic arsenic concentration exceeds the PEL or when the possibility of skin or eye irritation from inorganic arsenic exists.

5.4.4.4 Employees working in regulated areas or subject to the possibility of skin or eye irritation from inorganic arsenic shall shower at the end of the work shift.

5.4.4.5 Lunchrooms facilities shall be provided for employees working in regulated areas. Lunchroom facilities shall have a temperature controlled, positive pressure, filtered air supply, and will be readily accessible to employees working in regulated areas.

5.4.4.6 Employees working in the regulated area or subject to the possibility of skin or eye irritation from exposure to inorganic arsenic will wash their hands and face prior to eating.

5.4.4.7 Employees working in areas where exposure exceeds 100 ug/m(3) will vacuum their protective clothing and clean or change their shoes worn in such areas before entering change rooms, lunchrooms or shower rooms.

5.5 Medical Surveillance

5.5.1 In general, medical surveillance will be followed in accordance with Policy and Procedure 1.12 (Medical Surveillance). Any worker who is or will be exposed to inorganic arsenic above the action level for 30 days or more per year will participate in Brandenburg's Medical Surveillance Program. All employees who have been exposed above the action level for 30 days or more per year for a total of ten (10) years or more of combined employment with the employer or predecessor employers prior to or after the effective date of the inorganic arsenic OSHA standard will participate in Brandenburg's Medical Surveillance Program.

5.5.2 Physician Written Opinion

5.5.2.1 The physician will provide the affected worker a copy of the examining physician's written opinion.

5.5.2.2 The written opinion will contain the following information:

5.5.2.2.1 The results of the medical examination and tests performed.

5.5.2.2.2 The physician's opinion as to whether the employee has any detected medical conditions which would place the employee at increased risk of material impairment of the employee's health from exposure to inorganic arsenic

5.5.2.2.3 Physician recommended limitation upon the worker's exposure to inorganic arsenic or upon the worker's use of PPE and respirators.

5.5.2.2.4 A statement that the worker has been informed by the physician of the results of the medical examination and any medical conditions results from inorganic arsenic exposure which requires further explanation or treatment.

5.6 Information and Training

5.6.1 Each employee who is subject to exposure to inorganic arsenic above the action level without regard to respirator use, or for whom there is the possibility of skin or eye irritation from inorganic arsenic shall receive information and training at the time of their initial assignment and yearly thereafter.

5.6.2 Training will include hazard communication training, a review of the OSHA standard and specific training pertinent to arsenic such as; medical surveillance, health hazard data, protective clothing and equipment, hygiene facilities and practices, engineering and work practice controls, signs and labels, exposure monitoring, record keeping, and exposure records.

5.7 Communication of Inorganic Arsenic Hazards to Workers

5.7.1 Signs and labels

Signs will be posted to regulated areas that indicate:

DANGER

INORGANIC ARSENIC

CANCER HAZARD

AUTHORIZED PERSONNEL ONLY

NO SMOKING OR EATING

RESPIRATOR REQUIRED

Containers of materials that contain inorganic arsenic will have the following label affixed:

DANGER

CONTAINS INORGANIC ARSENIC

CANCER HAZARD

HARMFUL IF INHALED OR SWALLOWED

USE ONLY WITH ADEQUATE VENTILATION

OR RESPIRATORY PROTECTION

6. Forms

6.1 Inorganic Arsenic Exposure Notification (SAF-33)

7. Regulatory / Permit Requirements

29 CFR 1910.1018

8. Record Keeping

Air monitoring records are maintained per and Records Retention Form, QUA-05. Employee medical and training records, including Exposure Notification Forms, are maintained per Employee Files, SOP and Records Retention Form, QUA-05.

Title	Date	Reference	Area
Hearing Conservation	**7/23/2012**	**5.09**	**Safety**

1. Summary

Brandenburg workers may come into contact with harmful levels of occupational noise. In order to protect workers' hearing, Brandenburg has developed a hearing conservation program.

2. Scope

All applicable Brandenburg personnel and work sites will be outlined within this procedure as required

3. Definitions

3.1 Action Level (AL) - An 8-hour time weighted average of 85 decibels or a dose of 50% measured on the A-scale (dBA), slow response.

3.2 Audiogram - A chart, graph or table resulting from a hearing test showing an individual's hearing threshold levels as a function of frequency.

3.3 Decibel (dB) - A unit of measurement of sound level (intensity).

3.4 dBA - decibels A–Weighted - A unit of measurement of sound level as it pertains to the A scale.

3.5 Standard Threshold Shift (STS) - As used in this procedure, a STS is a change in hearing threshold relative to the baseline audiogram of an average of 10 dB or more at 2000, 3000, and 4000 Hz frequency levels in either ear.

3.6 Permissible Noise Exposures – An 8-hour time weighted average of 90 decibels measured on the A-scale (dBA), slow response

4. Responsibility

Responsibility of personnel will be outlined within this procedure as required

5. Methods

5.1 Hazard Assessment

A hazard assessment will take place prior to the inception of site work activity to determine whether occupational noise is present in the workplace and whether there is the possibility that employee exposures will be at or above the action level. This hazard assessment may be documented in the Engineering Survey, safety survey, Health and Safety Plan (HASP), or in the form of a Task Safety Analysis (TSA).

5.2 Monitoring

Brandenburg shall use representative personal sampling to identify employees for inclusion in the hearing conservation program and to enable the proper selection of hearing protectors.

5.3 Engineering and Administrative Control Measures

5.3.1 Processes and equipment that produce noise levels in workers above the action level will be controlled by engineering and/or administrative controls whenever feasible. If such controls fail to reduce sound levels below permissible noise exposures at or above the action level (AL), personal protective equipment (PPE) shall be provided and used to reduce sound levels.

5.3.2 The potential to produce noise above the action level will be considered as a factor in replacement, modification, and addition of facilities and equipment.

5.3.3 Hearing protection must be worn in areas with posted warning signs. Other activities which require hearing protection may include but are not limited to operating power and pneumatic tools, operating concrete crusher, operating skid steer loaders (STL), and torch cutting,

5.4 Hearing Protective Devices

5.4.1 The Health & Safety Division will evaluate hearing protector attenuation for the specific noise environments in which the hearing protector will be used.

5.4.2 Hearing protective devices will be used when engineering and administrative controls are found not to be effective or feasible to control noise below the action level (AL) or permissible noise exposures.

5.4.3 Workers will be given the opportunity to select their own personal hearing protectors from a variety of suitable devices provided by Brandenburg.

5.4.4 Workers are responsible for the care and maintenance of their hearing protectors. Hearing protectors are replaced as necessary due to wear or deterioration.

5.5 Employee Notification, Information and Training

5.5.1 Brandenburg shall train each employee who is exposed to noise at or above an 8-hour time weighted average of 85 decibels in accordance with the following:

5.5.1.1 The purpose of hearing protectors, the advantages, disadvantages, and attenuation of various types, and instructions on selection, fitting, use, and care;

5.5.1.2 The effects of noise on hearing; and

5.5.1.3 The purpose of audiometric testing, and an explanation of the test procedures.

5.5.2 Brandenburg shall notify each employee exposed at or above an 8-hour time-weighted average of 85 decibels of the results of the monitoring.

5.5.3 Brandenburg shall make available to affected employees or their representatives copies of the OSHA Occupational Noise Exposure standard and shall also make it readily available in the workplace.

5.6 Audiometric Testing

5.6.1 Audiometric testing, provided by a licensed physician, will be given to all workers in accordance with Brandenburg's Medical Surveillance Program (1.12). An audiogram is given prior to commencement of work and is repeated annually for those employees who may be exposed to noise above the action level (AL) of 85dBA.

5.6.2 Workers will be notified of the results of each audiogram.

5.6.3 If it is determined that a STS has occurred, the affected workers will be informed within 21 days of the determination and:

5.6.3.1 Employees not using hearing protectors shall be provided with hearing protectors, trained in their use and care, and required to use them, and

5.6.3.2 Employees already using hearing protectors shall be retrained in the use of hearing protectors and provided with hearing protectors offering greater attenuation if necessary.

6. Forms

None

7. Regulatory / Permit Requirements

29 CFR 1910.95

8. Recordkeeping

Noise exposure monitoring records are maintained per Records Retention Form, QUA-05. Employee medical and training records, including Exposure Notification Forms, are maintained per Employee Files, SOP and Records Retention Form, QUA-05.

Title	Date	Reference	Area
Thermal Stress	**7/23/2012**	**5.10**	**Safety**

1. Summary

All workers may be exposed to temperature extremes during the course of their employment. Workers who wear protective clothing may be at an increased risk to heat related disorders. Brandenburg has developed this procedure to eliminate the effects of temperature on workers.

2. Scope

All applicable Brandenburg personnel and work sites will be outlined within this procedure as required

3. Definitions

3.1 Frostbite - A common injury caused by exposure to extreme cold temperature that usually affects body part extremities. Frostbite usually restricts blood flow to the affected parts. Frostbitten body parts typically get extremely cold. This cold sensation may be followed by numbness or a hot or warm sensation. Frostbite can result in damage to and loss of tissue.

3.2 Heat Exhaustion – Symptoms include profuse sweating, weakness, rapid pulse, dizziness, nausea, and headache. The skin is cool, pale and clammy with sweat. Body temperature is normal or lower.

3.3 Heat Stress - The combination of environmental and physical work factors that constitute the total heat load imposed on the body. The environmental factors are: air temperature, humidity, radiant heat exchange, air movement and water vapor pressure. Physical work produces metabolic heat proportional to the intensity of work. The amount and type of clothing is also a factor.

3.4 Heat Stroke – A heat related affliction where sweating is diminished or absent. The skin is hot, dry and flushed. Body temperature is increased.

3.5 Hypothermia – A condition of reduced body temperature which could be life threatening. Most cases of hypothermia develop in air temperatures between 0-50 degrees F.

4. Responsibility

Responsibility of personnel will be outlined within this procedure as required

5. Methods

5.1 General

5.1.1 Preventative measures should be instituted first to prevent heat/cold stress. If the preventative measures are not effective, further control measures will be implemented.

5.1.2 If preventative measures are not effective in reducing heat/cold stress as evidenced by heat/cold disorders and/or employee complaints, the Supervisor will contact an Environmental Health & Safety (EHS) Manager to assist in developing more effective control measures to prevent heat/cold stress.

5.2 Cold Injury Prevention

5.2.1 Workers are expected and required to wear protective clothing appropriate for the level of cold and physical activity.

5.2.2 The use of extra insulating clothing and a reduction in the duration of the exposure to cold will be used to protect against cold injury.

5.2.3 If available clothing does not give adequate protection to prevent hypothermia or frostbite, work will be modified or suspended until conditions improve.

5.2.4 If the air velocity at the job site is increased by wind, draft or artificial ventilation, the cooling effect of the wind should be reduced by shielding the work area or by wearing an easily removable windbreak garment.

5.2.5 If work is performed continuously in the cold at an equivalent wind chill temperature of 20 degrees F or less, workers will be allowed to warm themselves in heated warming shelters located nearby. The frequency of warm-up breaks will be dependent on the severity of the environmental exposure.

5.2.6 For work at or below 10 degrees F the following will apply:

5.2.6.1 The worker will be under constant protective observation (buddy system).

5.2.6.2 The work rate should not be so high as to cause heavy sweating that will result in wet clothing.

5.2.6.3 The work should be arranged in such a way that sitting still or standing still for long periods is minimized.

5.3 Heat Related Injury Prevention

Heat related injury can occur at temperatures above 70 degrees F. The possibility of heat related injury increases when workers are required to wear whole body protection or other types of personal protective equipment (PPE).

5.3.1 Acclimatization

5.3.1.1 Acclimatization varies widely with each individual. People who are physically unfit, older, obese, taking medications or using alcohol or drugs may not acclimatize readily and can be prone to heat stress if placed in a heat stress environment without acclimatization.

5.3.1.2 Workers can lose acclimatization in a few days and work regimens should be adjusted to account for this. The degree to which a worker's body has physiologically adjusted to working under hot conditions affects his/her ability to do work. Acclimated individuals generally have lower heart rates and body temperatures and sweat sooner and more profusely than do individuals who are not acclimated.

5.3.2 Work/Rest Regimen

5.3.2.1 A work/rest regimen can be used to ensure workers are not affected from heat stress.

5.3.2.2 During breaks workers will be urged to spend time out of the sun or away from heat sources.

5.3.2.3 Drink liquids. Cool (about 50 degrees) water will be made available and workers will be encouraged to drink plenty of water or other fluids during times of extreme sweating.

5.3.2.4 If workers believe that they or a co-worker is experiencing heat stress or related symptoms, they should contact their Supervisor immediately.

5.3.2.4.1 The Supervisor will assess the situation to determine if work rest regimens should be adjusted or other control methods should be implemented.

5.3.2.4.2 The Supervisor can obtain assistance from an EHS Manager or other members of management.

5.4 Training Requirements

All workers will be trained to recognize heat/cold disorders, and how to control heat/cold stress through diet, water intake, clothing, etc.

5.4.1 Cold Stress Training

All employees will receive training on temperature stress prior to working in temperature stress environments. For working in cold environments, the training will include:

5.4.1.1 Types and symptoms of cold stress

5.4.1.2 Cold stress prevention methods

5.4.1.3 Cold stress treatment procedures

5.4.2 Heat Stress Training

All employees will receive training on temperature stress prior to working in temperature stress environments. For working in hot environments, the training will include:

5.4.2.1 Types and symptoms of heat stress

5.4.2.2 Heat stress prevention methods

5.4.2.3 Heat stress treatment procedures

6. Forms

None

7. Regulatory / Permit Requirements

None

8. Recordkeeping

None

Title	Date	Reference	Area
Dust Suppression and Control	**7/23/2012**	**5.12**	**Safety**

1. Summary

During the normal course of work activities, dust may be produced or emitted. Brandenburg uses a variety of methods to control the emission of dusts including but not limited to: barriers, water sprays, surfactants, housekeeping, surface sweeping, tarping loads, reduced speeds and designated travel routes.

2. Scope

All applicable Brandenburg personnel and work sites will be outlined within this procedure as required

3. Definitions

None

4. Responsibility

Responsibility of personnel will be outlined within this procedure as required

5. Methods

5.1 Planning Site Work

Brandenburg pre-plans site work activities by conducting walkthrough's with key project personnel, completing surveys (Engineering, Safety, Commercial, & Environmental) and writing various plans in an effort to control all site hazards including dust. Based on operating experiences, changes in scope of work and conditions, revisions to these surveys and plans may be necessary.

5.2 Monitoring of Site Activities

5.2.1 Prior to the start of work each day, an assessment of environmental conditions (wind speed, wind direction, & temperature) shall be made by the Supervisor to determine if the dust suppression and control measures are adequate. The Supervisor shall have the authority to modify dust suppression and control measures to allow work to continue after assessing the current environmental conditions. The Supervisor may shut down portions of the work or the entire site if the dust suppression and control measures are not adequately controlling dust and particulate matter.

5.3 Controlling Emissions With Water

5.3.1 At the point of demolition activity, the building or structure will be sprayed with a hose as needed.

5.3.2 A hose will be used to spray debris piles as needed during sorting/handling unless the material is already adequately wet from the building demolition activity.

5.3.3 A hose shall be used to spray the debris pile as needed during loading unless the material is already adequately wet from the building demolition activity.

5.3.4 Water from the hydrants, hoses, or the water truck will be used to wet the drive lanes for Brandenburg trucks, equipment, and site vehicular traffic as needed.

5.3.5 Additional measures will be added as necessary such as additional hoses, Dust Boss® water barrier, or larger concentrations of water applied from a water truck.

5.3.6 Water usage will be monitored by the Supervisor to prevent accumulations of water that could migrate and cause sediment transport or erosion.

5.3.7 The use of water sprays shall not be used if it produces a *greater hazard* (ie., slippery surfaces, icing, electrical, etc…)

5.4 Controlling Emissions Using Other Means

5.4.1 Should the situation require further reduction in emissions, the following controls may be implemented:

- Installing a dust barrier on the fence surrounding work areas,
- Installing enclosures made of poly and wood framing or similar material,
- Installing tarps on trailers,
- Street and/or surface sweeping,
- Utilizing existing building structures as a shield to restrict dust transmission,
- Using poly or similar to cover debris stockpiles,
- Implementing traffic control plans including restrictions on travel speeds and routes

5.4.2 Along with dust controls, should the owner's surrounding structures require increased protection from dust, Brandenburg can install window coverings, wall coverings, material coverings, duct tape over joints, or use other means to protect surrounding employees or property.

6. Forms

None

7. Regulatory / Permit Requirements

Various local, state and federal regulations

8. Record Keeping

None

Title	Date	Reference	Area
Cadmium	**7/23/2012**	**5.13**	**Safety**

1. Summary

A variety of work activities exist whereby Brandenburg workers may be exposed to cadmium. These activities include demolition, maintenance, welding activities and the use of cutting torches and other similar devices. This procedure has been developed in order to protect workers from cadmium overexposure.

2. Scope

All applicable Brandenburg personnel and work sites will be outlined within this procedure as required

3. Definitions

3.1 Cadmium – An extremely toxic metal commonly found in industrial workplaces where any ore is being processed or smelted.

3.2 Action Level (AL) - The level of employee exposure, without regard to the use of respirators, to an airborne concentration of cadmium of 2.5 micrograms per cubic meter of air (2.5 ug/m^3) calculated as an 8 hour time weighted average (TWA).

3.3 Permissible Exposure Limit (PEL) - The maximum level of cadmium in the air to which an employee may be exposed over an 8 hour work day. The PEL for cadmium is 5 micrograms per cubic meter (5 ug/m^3) calculated as an 8 hour time weighted average (TWA).

4. Responsibility

Responsibility of personnel will be outlined within this procedure as required

5. Methods

5.1 General

5.1.1 Occupational exposure to cadmium and cadmium compounds exists in all forms, including fumes and dust.

5.1.2 Sources of cadmium and the types of activities that expose workers to cadmium vary among projects but can be generalized as follows:

5.1.2.1 Use of cadmium-containing paints

5.1.2.2 Brazing or welding with cadmium alloys

5.1.2.3 Cutting, brazing, burning, grinding, or welding on surfaces that are painted with cadmium containing paint

5.1.2.4 Cutting and welding cadmium-plated steel

5.1.2.5 Wrecking and demolishing where cadmium is present

5.1.2.6 Electrical work using cadmium-coated conduits

5.1.2.7 Transporting, storing or disposing of cadmium or cadmium-containing materials

5.1.2.8 Performing work at cadmium contaminated work sites

5.1.3 Hazard Assessments

5.1.3.1 A hazard assessment will take place prior to the inception of site work to determine whether cadmium is present in the workplace and whether there is the possibility that employee exposures will be at or above the action level. This hazard assessment may be documented in the Engineering Survey, safety survey, the site-specific Health and Safety Plan (HASP), a Task Safety Analysis (TSA), or other similar document.

5.1.4 Exposure Assessments

5.1.4.1 Where cadmium has been determined to be present in the workplace, and it has been determined that there is a possibility the employee's exposure will be at or above the action level, 8-hour TWA exposures shall be determined for each employee on the basis of one or more personal breathing-zone air samples reflecting full shift exposure for each job classification in each work area.

5.2 Air Monitoring

5.2.1 Monitoring for airborne cadmium may be performed by: in-house staff, outside consultants, or other competent sources.

5.2.2 Monitoring may be conducted by sampling a representative number of workers who are expected to have the highest exposure levels (worst case scenario).

5.2.3 If the initial monitoring or periodic monitoring is at or above the action level, monitoring shall be at a frequency and pattern needed to assure that the monitoring results reflect with reasonable accuracy the employee's typical exposure levels and to assure the adequacy of respiratory selection and the effectiveness of engineering and work practice controls.

5.2.4 If initial monitoring or periodic monitoring indicates employee exposures are below the action level and that result is confirmed by the results of additional monitoring taken at least seven (7) days later, monitoring may discontinue for those employees whose exposures are represented by such monitoring.

5.2.5 Monitoring may be increased if:

5.2.5.1 There have been worker complaints or symptoms which may be attributable to cadmium exposure.

5.2.5.2 There has been a change in the raw materials, equipment, personnel, work practices, or finished products that may result in additional employees being exposed to cadmium at or above the action level or in employees already exposed to cadmium at or above the action level being exposed above the PEL.

5.2.5.3 Brandenburg personnel or other competent person has any reason to suspect that any other change might result in further exposure.

5.3 Analytical Results

5.3.1 Within five (5) working days after the receipt of monitoring results each affected employee will be notified of the results either individually in writing using the Cadmium Exposure Notification form (SAF-43) or by posting the results in an appropriate location that is accessible to employees.

5.3.2 Whenever the results indicate that the representative employee exposure exceeds the permissible exposure limit (PEL), the written notice shall include a statement that the PEL was exceeded and a description of the corrective action taken to reduce exposure to or below the PEL.

5.4 Control Methods

5.4.1 Respiratory Program

5.4.1.1 Respiratory protection will be used, in combination with engineering controls and work practices, to maintain employee airborne cadmium exposures below the PEL during:

5.4.1.1.1 Periods necessary to install or implement feasible engineering or work-practice controls when employee exposures exceed the PEL,

5.4.1.1.2 Maintenance and repair activities

5.4.1.1.3 Brief or intermittent work operations, for which employee exposures exceed the PEL and engineering and work-practice controls are not feasible or are not required,

5.4.1.1.4 Work operations in the regulated areas,

5.4.1.1.5 Work operations for which the employer has implemented all feasible engineering and work-practice controls, and such controls are not sufficient to reduce employee exposures to or below the PEL,

5.4.1.1.6 Work operations for which an employee, who is exposed to cadmium at or above the action level, requests a respirator,

5.4.1.1.7 Work operations for which engineering controls are not required to reduce employee exposures that exceed the PEL, and

5.4.1.1.8 Emergencies.

5.4.1.2 Respiratory protection for airborne cadmium will correspond to the airborne cadmium concentrations as follows:

5.4.1.2.1 For concentrations of airborne cadmium equal to or less than 50 ug/m^3 a half mask respirator equipped with P100 filters will be used.

5.4.1.2.2 For concentrations of airborne cadmium equal to or less than 250 ug/m^3 a full face mask with P100 filters will be used.

5.4.1.2.3 Should the worker choose a powered air purifying respirator instead of a negative pressure respirator, it will be provided.

5.4.2 Personal Protective Clothing

5.4.2.1 Employees exposed to cadmium above the PEL or cadmium compounds which may cause skin or eye irritation are required to wear protective clothing and equipment.

5.4.2.2 Brandenburg will provide protective clothing and equipment to employees and will ensure its use. Equipment varies by task and may include but is not limited to: respirators, coveralls; gloves, head covers; hard hats, shoe covers, face shields and goggles.

5.4.2.3 Clean and dry changes of protective clothing will be issued weekly, at a minimum.

5.4.2.4 The removal of cadmium from protective clothing by blowing, shaking, or any other means which disperses cadmium into the air is prohibited.

5.4.2.5 Brandenburg will ensure reusable clothing is laundered and repaired as necessary. Third party services used to launder and repair clothing will be informed in writing of the potentially harmful effects of exposure to cadmium and that the clothing and equipment should be laundered or cleaned in a manner to effectively prevent the release of airborne cadmium in excess of the PEL.

5.4.2.6 Contaminated clothing containers will be labeled as follows: **"DANGER: CONTAINS CADMIUM. CANCER HAZARD. AVOID CREATING DUST, CAN CAUSE LUNG AND KIDNEY DISEASE**."

5.4.3 Engineering Controls and Work Practices

5.4.3.1 Brandenburg will institute engineering and work practice controls to reduce and maintain employee exposure to cadmium at or below the permissible exposure limits (PEL) to the extent feasible.

5.4.3.2 Where engineering and work practice controls are not sufficient to reduce exposures to or below the PEL, they shall nonetheless be used to reduce exposures to the lowest levels achievable by these controls and shall be supplemented by the use of respirators and other necessary personal protective equipment. Employee job rotation may not be used as a method of compliance.

5.4.3.3 The requirement to implement engineering controls to achieve the PEL does not apply when the following can be demonstrated:

5.4.3.3.1 The employee is only intermittently exposed; and

5.4.3.3.2 The employee is not exposed above the PEL on 30 or more days per year (12 consecutive months)

5.4.4 Housekeeping / Hygiene Facilities

5.4.4.1 Where airborne exposure to cadmium is above the PEL, Brandenburg shall provide clean change rooms, hand washing facilities, showers, and lunchroom facilities.

5.4.4.2 Employees who are exposed to cadmium above the PEL will shower at the end of the work shift.

5.4.4.3 Employees who are exposed to cadmium above the PEL must wash their hands and faces prior to eating, drinking, smoking, chewing tobacco or gum, or applying cosmetics.

5.4.4.4 Lunchroom facilities will be readily accessible to employees and the tables used for eating will be maintained free of cadmium.

5.4.4.5 Employees will not enter lunchroom facilities with protective work clothing or equipment unless surface cadmium has been removed from their clothing and equipment by HEPA vacuuming or some other method that removes cadmium dust without dispersing it.

5.4.4.6 Where feasible, HEPA filtered vacuum cleaners will be used for housekeeping.

5.4.4.7 Accumulations of cadmium containing dust and debris generated by work activities will be removed as soon as practical based on the work to be performed and constraints of the job.

5.5 Medical Surveillance

5.5.1 Employees who are or may be exposed to cadmium at or above the action level for 30 or more days within 12 consecutive months will be included in a medical surveillance program.

5.5.2 The medical surveillance program will be performed in accordance with procedure 1.12 (Medical Surveillance) and will include the provisions outlined below.

5.5.2.1 Elements of the program include: medical examinations performed under supervision of a licensed physician; biological monitoring in the form of blood sampling, urine sampling and a beta -2 microglobulin in urine through an OSHA approved laboratory.

5.5.3 The initial medical examination shall include:

5.5.3.1 A detailed medical and work history;

5.5.3.2 Cadmium in urine (CdU), standardized to grams of creatinine (g/Cr);

5.5.3.3 Beta-2 microglobulin in urine (B(2)-M), standardized to grams of creatinine (g/Cr), with pH specified; and

5.5.3.4 Cadmium in blood (CdB), standardized to liters of whole blood (lwb).

5.5.4 Actions triggered by initial biological monitoring and periodic medical examinations shall be performed as outlined in 29 CFR 1926.1127(l)(3) and 29 CFR 1926.1127(l)(4), respectively.

5.5.5 A copy of the physician's written medical opinion will be obtained and provided the employee within five (5) working days after receipt.

5.6 Training

5.6.1 Training will be provided to all employees who may potentially be exposed to cadmium prior to or at the time of initial assignment to a job involving potential exposure to cadmium and at least annually thereafter.

5.6.2 Elements of the program include: initial and annual refresher training, elements of the standard, operations which could result in exposure, use and care of respirators and other protective equipment, purpose and description of the medical surveillance program including health effects from overexposure, engineering controls and work practices, compliance strategy, and explanation of the employee's rights to access information.

5.7 Regulated Work Areas

5.7.1 A regulated area shall be established wherever an employee's exposure to airborne concentrations of cadmium is, or can reasonably be expected to be in excess of the permissible exposure limit (PEL).

5.7.2 Regulated areas shall be demarcated from the rest of the workplace in any manner that adequately establishes and alerts employees of the boundaries of the regulated area, including employees who are or may be incidentally in the regulated areas, and that protects persons outside the area from exposure to airborne concentrations of cadmium in excess of the PEL.

5.7.3 Access to regulated areas shall be limited to authorized persons

5.7.4 Each person entering a regulated area shall be supplied with and required to use a respirator appropriate for the level of exposure as outlined in 5.4.1.

5.7.5 Employees are prohibited from eating, drinking, smoking, chewing tobacco or gum, or applying cosmetics in regulated areas, or carrying and storing the products associated with any of these activities into regulated areas.

5.7.6 Warning signs shall be provided and displayed in regulated areas. In addition, warning signs shall be posted at all approaches to regulated areas. Warning signs shall bear the following information:

DANGER
CADMIUM
CANCER HAZARD
CAN CAUSE LUNG AND KIDNEY DISEASE
AUTHORIZED PERSONNEL ONLY
RESPIRATORS REQUIRED IN THIS AREA

6. Forms

6.1 Cadmium Exposure Notification (SAF-43)

7. Regulatory / Permit Requirements

29 CFR 1926.1127

8. Record Keeping

Air monitoring records are maintained per Records Retention Form, QUA-05. Employee medical and training records, including Exposure Notification Forms, are maintained per Employee Files, SOP and Records Retention Form, QUA-05.

Title	Date	Reference	Area
Hexavalent Chromium	**7/23/2012**	**5.14**	**Safety**

1. Summary

A variety of work activities exist whereby Brandenburg workers may be exposed to Hexavalent Chromium – Cr(VI). This procedure has been developed in order to protect workers from chromium (VI) overexposure.

2. Scope

All applicable Brandenburg personnel and work sites will be outlined within this procedure as required

3. Definitions

3.1 Hexavalent Chromium (Chromium VI) – A highly toxic metal used in a number of industrial processes including chrome plating, steel production, paint and cement making.

3.2 Action Level (AL) - The concentration of airborne chromium (VI) of 2.5 micrograms per cubic meter of air (2.5 ug/m^3) calculated as an 8 hour time weighted average (TWA).

3.3 Permissible Exposure Limit (PEL) - The concentration of airborne chromium (VI) of 5 micrograms per cubic meter (5 ug/m^3) calculated as an 8-hour time-weighted average (TWA).

3.4 Physician or Other Licensed Health Care Professional (PLHCP) - An individual whose legally permitted scope of practice (i.e., license, registration, or certification) allows him or her to independently provide some or all of the particular health care services required under 1926.1126(i).

4. Responsibility

Responsibility of personnel will be outlined within this procedure as required

5. Methods

5.1 General

5.1.1 Occupational exposure to chromium (VI) and chromium (VI) compounds exists in all forms, including dusts, fumes and mists.

5.1.2 Sources of chromium (VI) and the types of activities that may expose workers to chromium (VI) may include but not be limited to:

5.1.2.1 Welding or cutting on stainless steel, nonferrous chromium alloys, or surfaces coated with chromium (VI) paint;

5.1.2.2 Wrecking and demolishing structures where chromium (VI) is present;

5.1.2.3 Hazardous waste site remediation activities (e.g. – contaminated soil and concrete removal, site characterization, concrete removal); and

5.1.2.4 Scrap handling activities.

5.1.3 Hazard Assessments

A hazard assessment will take place prior to the inception of site work involving potential chromium (VI) exposures. This hazard assessment may be documented in the Engineering

Survey, safety survey, site-specific Health and Safety Plan (HASP), a Task Safety Analysis (TSA), or other similar document.

5.1.4 Exposure Assessments

Brandenburg performs personal sampling of employees to determine worker exposure to chromium (VI). We recognize that certain work activities can have substantial variation in worker exposure to airborne contaminants. Due to this variability, we routinely monitor our workers for a variety of contaminants, including chromium (VI). Historical monitoring data may be relied upon to determine employee exposure for those jobs in which the processes, work practices, environmental conditions, and chromium (VI) characteristics are the same.

5.1.5 If initial monitoring indicates that employee exposures are below the action level, monitoring may be discontinued for those employees whose exposures are represented by such monitoring.

5.1.6 If monitoring reveals employee exposures to be at or above the action level, monitoring shall be performed at least every six (6) months.

5.1.7 If monitoring reveals employee exposures to be above the PEL, monitoring shall be performed at least every three (3) months.

5.1.8 If periodic monitoring reveals employee exposures are below the action level, and the result is confirmed by the result of another monitoring taken at least seven (7) days later, monitoring may be discontinued for those employees whose exposures are represented by such monitoring.

5.1.9 Monitoring may be increased if:

5.1.9.1 There has been a change in the production process, raw materials, equipment, personnel, work practices, or control methods that may result in new or additional exposures to chromium (VI), or

5.1.9.2 Brandenburg has any reason to believe that new or additional exposures have occurred.

5.2 Analytical Results

5.2.1 Within five (5) working days after making an exposure determination, the EHS Manager will either post the results in an appropriate location that is accessible to all affected employees or shall notify each affected employee individually, in writing, the result using the Chromium Exposure Notification form (SAF-61).

5.2.2 Where the exposure determination indicates that employee exposure exceeds the PEL, the EHS Manager shall describe in the written notification the corrective action being taken to reduce the exposure to or below the PEL.

5.3 Control Methods

5.3.1 Respiratory Program

5.3.1.1 Respiratory protection will be used, in combination with engineering controls and work practices, to maintain employee airborne chromium (VI) exposures below the PEL. Respiratory protection for airborne chromium (VI) will correspond to the airborne chromium (VI) concentrations as follows:

5.3.1.1.1 For concentrations of airborne chromium (VI) below 50 ug/m^3 a half mask respirator equipped with a P100 (HEPA) filter will be used.

5.3.1.1.2 For concentrations of airborne chromium (VI) equal to or greater than 50 μg/m^3 but less than 250 ug/m^3 a full face mask with a P100 (HEPA) filter will be used. NOTE: quantitative respirator fit is required.

5.3.2 Personal Protective Clothing & Equipment

5.3.2.1 Where a hazard is present or is likely to be present from skin or eye contact with chromium (VI), employees shall be provided appropriate personal protective clothing and equipment.

5.3.2.2 Brandenburg will provide personal protective clothing and equipment to employees and will ensure its use. Clothing and equipment varies by task and may include but is not limited to: coveralls; gloves, respirators, head covers; hard hats, foot coverings, shoe covers, face shields and goggles.

5.3.2.3 Brandenburg will ensure that employees remove all protective clothing and equipment contaminated with chromium (VI) at the end of the work shift or at the completion of their task involving chromium (VI) exposure, whichever comes first.

5.3.2.4 Brandenburg will ensure that no employee removes chromium (VI) contaminated clothing or equipment from the workplace, except for those employees whose job it is to launder, clean, maintain, or dispose of such clothing or equipment.

5.3.2.5 The removal of chromium (VI) from protective clothing by blowing, shaking, or any other means which disperses chromium (VI) into the air is prohibited.

5.3.2.6 Brandenburg will ensure chromium (VI) contaminated clothing and equipment removed for laundering, cleaning, maintenance, or disposal are stored and transported in sealed, impermeable bags or other closed, impermeable containers labeled as follows: **"DANGER: CONTAINS HEXAVALENT CHROMIUM. AIRBORNE EXPOSURE MAY CAUSE LUNG CANCER. MAY CAUSE IRRITATION OR DAMAGE TO NOSE, THROAT, AND RESPIRATORY TRACT IF BREATHED AT HIGH LEVELS. MAY CAUSE IRRITATION OR DAMAGE TO EYES AND SKIN WHEN CONTACTED IN HIGH CONCENTRATIONS."**

5.3.2.7 Third party services used to launder and clean chromium (VI) contaminated clothing or equipment will be informed in writing of the potentially harmful effects of

exposure to chromium (VI) and that the clothing and equipment should be laundered or cleaned in a manner that minimizes skin or eye contact with chromium (VI) and effectively prevents the release of airborne chromium (VI) in excess of the PEL.

5.3.3 Work Practices/Engineering Controls

5.3.3.1 Workers will perform their work tasks in a manner that will minimize their exposures to chromium (VI). Work practices include the following:

5.3.3.1.1 Standing upwind when using a cutting torch or any time there might be exposure to chromium (VI) dust, fumes and mists;

5.3.3.1.2 Keeping his/her face and breathing zone as far away as possible from the work so as to minimize their exposure to chromium (VI);

5.3.3.1.3 Avoidance of cutting torch use on materials that might emit large amounts of chromium (VI) fume; and

5.3.3.1.4 Obtaining ventilation such as fans or air movers to remove contaminated air and introduce non-contaminated air into the worker's breathing zone.

5.3.3.2 Engineering controls will be used whenever feasible to reduce and maintain employee exposure to chromium (VI) to or below the PEL. Engineering controls may include the following:

5.3.3.2.1 Use of torches with three foot handles to keep fumes away from employee's breathing zone,

5.3.3.2.2 Use of mechanical equipment (hydraulic shears, electric saws etc.) to cut steel.

5.3.3.3 Brandenburg shall not rotate workers to different jobs to achieve compliance with the PEL.

5.3.4 Hygiene Areas and Practices

5.3.4.1 Change rooms will be provided at all jobs where protective clothing and equipment is required.

5.3.4.1.1 Change rooms shall be equipped with separate storage areas for protective clothing and equipment and for street clothes to prevent cross contamination.

5.3.4.2 Washing facilities shall be provided when employees have skin contact with chromium (VI).

5.3.4.2.1 Brandenburg will ensure that affected employees wash their hands and face at the end of their work shift and prior to eating, drinking, smoking, chewing tobacco or gum, applying cosmetics, or using the toilet.

5.3.4.3 Brandenburg will ensure that eating and drinking areas and surfaces are maintained as free as practicable of chromium (VI).

5.3.4.3.1 Brandenburg will ensure that employees do not enter eating or drinking areas with protective clothing or equipment unless surface chromium (VI) has been removed by methods that do not disperse chromium (VI) into the air or onto an employee's body.

5.3.4.4 Brandenburg will ensure that employees do not eat, drink, smoke, chew tobacco or gum, apply cosmetics in areas where skin or eye contact with chromium (VI) occurs; or carry the products associated with these activities, or store such products in these areas.

5.4 Medical Surveillance

5.4.1 Brandenburg shall make medical surveillance available to the following employees:

5.4.1.1 Employees who are or may be reasonably exposed to chromium (VI) at or above the action level for 30 or more days a year;

5.4.1.2 Employees experiencing signs or symptoms of chromium (VI) exposure; and

5.4.1.3 Employees exposed in an emergency.

5.4.2 Brandenburg shall provide employees with a medical examination under the supervision of a PLHCP at the following frequency:

5.4.2.1 Within 30 days after initial assignment;

5.4.2.2 Annually;

5.4.2.3 Within 30 days after a PLHCP's written opinion recommends an additional examination;

5.4.2.4 Whenever an employee shows signs or symptoms of the adverse health effects associated with chromium (VI) exposure;

5.4.2.5 Within 30 days after exposure during an emergency which results in an uncontrolled release of chromium (VI); or

5.4.2.6 At the termination of employment, unless the last examination was less than six months prior to the date of examination.

5.4.3 Medical examinations shall consist of the following:

5.4.3.1 A medical and work history;

5.4.3.2 A physical examination of the skin and respiratory tract; and

5.4.3.3 Any additional tests deemed appropriate by the examining PLHCP.

5.4.4 Brandenburg shall obtain a written medical opinion from a PLHCP within 30 days of each medical examination.

5.5 Training

5.5.1 Training will be provided to all employees exposed to chromium (VI) and include the following:

5.5.1.1 The methods that may be used to detect chromium (VI) in the work area;

5.5.1.2 The hazards of chromium (VI); and

5.5.1.3 Measures employees can take to protect themselves from the hazards of chromium (VI)

5.5.2 In addition, Brandenburg shall ensure that each employee can demonstrate knowledge of at least the following:

5.5.2.1 The requirements of 29 CFR 1926.1126 standard – Chromium (VI)

5.5.2.2 The medical surveillance program required including recognition of the signs and symptoms of adverse health effects that may result from chromium (VI) exposure.

6. Forms

6.1 Chromium Exposure Notification (SAF-61)

7. Regulatory / Permit Requirements

29 CFR 1926.1126

8. Record Keeping

Air monitoring records are maintained per Records Retention Form, QUA-05. Employee medical and training records, including Exposure Notification Forms, are maintained per Employee Files, SOP and Records Retention Form, QUA-05

Title	Date	Reference	Area
Pandemic Preparedness	**7/23/2012**	**5.15**	**Safety**

1. Summary

This procedure has been developed in an effort to reduce the impact of a pandemic on Brandenburg operations, employees, customers and the general public.

2. Scope

All applicable Brandenburg personnel and work sites will be outlined within this procedure as required

3. Definitions

3.1 Pandemic – A global disease outbreak

4. Responsibility

Responsibility of personnel will be outlined within this procedure as required

5. Methods

5.1 Employee protective measures to protect their own health and that of those around them include**:**

5.1.1 Stay home if you are sick with influenza-like illness.

5.1.2 Wash your hands frequently with soap and water for 20 seconds or use an alcohol-based hand sanitizer if soap and water are not available.

5.1.3 Avoid touching your nose, mouth and eyes**.**

5.1.4 Wash your hands or use an alcohol-based hand sanitizer after coughing, sneezing, or blowing your nose.

5.1.5 Keep frequently touched common surfaces clean. For example, telephones, computer equipment, etc.

5.1.6 Try not to use other workers' phones, desks, offices, or other work tools and equipment**.** If necessary, consider cleaning them first with a disinfectant.

5.1.7 Cover your coughs and sneezes with a tissue, or cough and sneeze into your upper sleeve. Dispose of tissues in no-touch trash receptacles

5.2 Brandenburg will implement the following protective measures to help protect the health of Brandenburg employees, customers and the general public:

5.2.1 Encourage ill workers to stay at home without fear of any reprisals.

5.2.2 Encourage workers to obtain a seasonal influenza vaccine, if it is appropriate for them according to CDC recommendations.

5.2.3 Instruct employees who are well but who have an ill family member at home with the flu that they can go to work as usual and monitor their health every day, notify their Supervisor and stay home should they become ill.

5.2.4 Provide education and training materials in an easy to understand format and in the appropriate language and literacy level for all employees. This shall include up-to-date

information on influenza risk factors, protective behaviors, and instruction on proper behaviors (for example…cough etiquette; avoid touching eyes, nose and mouth; and hand hygiene).

5.2.5 If an employee does become sick while at work, place the employee in a separate room or area until he/she can go home, away from other workers. Ask the employee to go home as soon as possible.

5.2.6 Implement practices to minimize face-to-face contact between workers if advised by the local health department**.** This may include but not be limited to the use of such strategies as extended use of e-mail, websites and teleconferences, encouraging flexible work arrangements (for example, telecommuting or flexible work hours) to reduce the number of workers who must be at the work site at the same time or in one specific location.

5.2.7 Provide resources and a work environment that promotes personal hygiene**.** This includes but is not limited to providing tissues, no-touch trash cans, hand soap, hand sanitizer, disinfectants and disposable towels for workers to clean their work surfaces.

5.2.8 Allow workers to telework (if feasible) or take personal leave to care for sick family members or care for children if schools close.

5.3 Brandenburg's Environmental Health & Safety (EHS) Administrator shall serve as the Pandemic Coordinator responsible for the following:

5.3.1 Assisting ill individuals in the workplace as needed.

5.3.2 Work with Brandenburg's insurance company to provide information to employees and customers about medical care in the event of a pandemic.

5.3.3 Work with employees and their union(s) to address policies for leave, telework, employee compensation, travel, childcare, and employee assistance services that may be covered under any of Brandenburg's employee-sponsored health plans.

5.3.4 Managing pandemic issues and their impact at the workplace, including contacting local health department and health care providers in advance in an effort to develop and implement necessary protocols for response to ill individuals. This may include managing and implementing "social distancing" programs when advised by Health Officials.

5.4 Brandenburg will implement the following in an effort to maintain business continuity:

5.4.1 Be aware of and review federal, state, and local health department pandemic plans

5.4.2 Incorporate health department pandemic plans into workplace plans.

5.4.3 Work with suppliers and customers to ensure Brandenburg can continue to operate and provide services.

5.4.4 Identify business-essential positions and people required to sustain business-necessary functions and operations.

5.4.5 Prepare and plan for operations with a reduced workforce.

5.4.6 Cross-train and/or develop ways to function in the absence of business-essential positions and people.

6. Forms

None

7. Regulatory / Permit Requirements

None

8. Record Keeping

Employee training records are maintained per Employee Files, SOP and Records Retention Form, QUA-05.

Title	Date	Reference	Area
Silica	**7/23/2012**	**5.16**	**Safety**

1. Summary

Brandenburg performs various activities which may produce crystalline silica dust including, but not limited to: demolition of masonry/concrete structures using heavy equipment and hand tools (e.g.- jack hammers, chipping guns, saws, and drills), concrete/masonry processing, crushing, loading, hauling, and dumping. This procedure has been developed to ensure that health hazards associated with occupational exposure to crystalline silica are reduced or eliminated.

2. Scope

All applicable Brandenburg personnel and work sites will be outlined within this procedure as required

3. Definitions

3.1 Crystalline Silica - A basic component of soil, sand, granite and many other minerals. Quartz is the most common form of crystalline silica. Cristobalite and tridymite are two other forms of crystalline silica. All three forms may become respirable size particles when workers chip, cut, drill, or grind objects that contain crystalline silica.

3.2 Permissible Exposure Limit (PEL) – The maximum level employee exposure, without regard to the use of respirators, to an airborne concentration of respirable silica.

4. Responsibility

Responsibility of personnel will be outlined within this procedure as required

5. Methods

5.1 Hazard Assessment

5.1.1 A hazard assessment will take place prior to the inception of site work involving potential silica exposures. This hazard assessment may be documented in the Engineering Survey, safety survey, site-specific Health and Safety Plan (HASP), a Task Safety Analysis (TSA), or other similar document

5.2 Exposure Assessments

5.2.1.1 Brandenburg performs personal sampling of employees to determine worker exposure to crystalline silica. We recognize that certain work activities can have substantial variation in worker exposure to airborne contaminants. Due to this variability, we routinely monitor our workers for a variety of contaminants, including crystalline silica. Historical monitoring data may be relied upon to determine employee exposure for those jobs in which the processes, work practices, environmental conditions, and crystalline silica characteristics are the same

5.3 Training

5.3.1 Training will be provided to all employees who have a reasonable risk of exposure to crystalline silica dust. Training will include:

5.3.1.1 Awareness of activities which may cause potential employee exposures;

5.3.1.2 Engineering or administration controls, where feasible, to reduce exposures;

5.3.1.3 Exposure limits;

5.3.1.4 The health hazards of crystalline silica; and

5.3.1.5 Measures employees can take to protect themselves from the hazards of crystalline silica

5.4 Safe Work Practices & Engineering Controls

Safe work practices and engineering controls shall be implemented to reduce and/or eliminate crystalline silica exposures in the workplace. These include, but are not limited to, the following:

5.4.1 Prohibit silica sand (or other substances containing more than 1% crystalline silica) as an abrasive blasting material and substitute less hazardous materials.

5.4.2 The use of water to wet surfaces and control dust will be the primary engineering control used to reduce and/or eliminate silica exposures.

5.4.3 Emphasis on worker positioning to increase the distance from the source of exposure to the worker's breathing zone.

5.4.4 Practice good personal hygiene to avoid unnecessary exposure to silica dust. There should be separate break areas for consuming food, beverages, etc. that are kept free of silica.

5.4.5 Provide periodic medical examinations

5.4.6 Maintain general housekeeping to avoid accumulation of silica dust. Dry sweeping or blowing with compressed air should be avoided.

5.4.7 Use forced ventilation methods (e.g.-fans) in enclosed areas to control dust as necessary.

5.5 Personal Hygiene

All Brandenburg employees will practice good personal hygiene as listed below:

5.5.1 Wash hands and faces before eating, drinking, or smoking.

5.5.2 Eating, drinking, or tobacco use is prohibited in the immediate work area.

5.5.3 Work clothes should be vacuumed before removal.

5.6 Protective Clothing and Personal Protective Equipment (PPE)

5.6.1 When respirators are used as means to address overexposure, the exposure shall not exceed the assigned protection factor for respirator assigned.

5.6.2 Wear only a Type CD abrasive-blast supplied-air respirator for abrasive blasting.

5.6.3 Wear disposable or washable work clothes and shower if facilities are available. Vacuum the dust from clothes and change into clean clothing prior to leaving the work site.

6. Forms

None

7. Regulatory / Permit Requirements

29 CFR 1926.55

8. Record Keeping

Air monitoring records are maintained per Records Retention Form, QUA-05. Employee medical and training records are maintained per Employee Files, SOP and Records Retention Form, QUA-05.

Title	Date	Reference	Area
Butadiene	**12/05/2013**	**5.17**	**Safety**

1. Summary

During the course of employment, some workers at Brandenburg may become exposed to materials that contain butadiene. This procedure has been developed in order to protect workers and prevent butadiene overexposure. There are a variety of work activities that may expose Brandenburg workers to butadiene. Butadiene is a major product in the petrochemical industry. It is used in resins, polymers for pipes and automobile and appliance manufacturing plants. Other activities where workers may be exposed include: demolition, welding, and maintenance of vessels and fabrication lines that may have contained or came into contact with material that contained butadiene.

2. Scope

All applicable Brandenburg personnel and work sites will be outlined within this procedure as required

3. Definitions

3.1 Butadiene (C_4H_6) - A colorless, non-corrosive, flammable gas with a hydrocarbon odor at ambient temperature and pressure.

3.2 Action Level (AL) - An airborne concentration of butadiene of 0.5 parts per million (ppm) of air calculated as an 8-hour time weighted average (TWA) without regard to the use of respirators.

3.3 Permissible Exposure Limits (PELs)

3.3.1 Time-Weighted Average Limit (TWA). Brandenburg shall ensure that no employee is exposed to an airborne concentration of butadiene in excess of one (1) ppm as an 8-hour time-weighted average.

3.3.2 Short-Term Exposure Limit (STEL). Brandenburg shall ensure that no employee is exposed to an airborne concentration of butadiene in excess of five (5) ppm as averaged over any 15 minute period.

4. Responsibility

Responsibility of personnel will be outlined within this procedure as required

5. Methods

5.1 Assessments

5.1.1 Hazard Assessments

5.1.1.1 A hazard assessment will take place prior to the inception of site work activity. This hazard assessment may be in the form of an Engineering Survey, safety survey, daily safety meeting, site-specific Health and Safety Plan (HASP), Task Safety Analysis (TSA), or similar document.

5.1.2 Exposure Assessments

When necessary, Brandenburg will perform personal sampling of employees to determine worker exposure to butadiene.

5.2 Hazards. Butadiene has the following NFPA hazard ratings

5.2.1 NFPA Hazard Ratings

5.2.1.1 Health – 2: Butadiene, on intense or short exposure, could cause temporary incapacitation or possible residual injuries, including those requiring the use of respiratory protective equipment having an air supply.

At acute high exposure, damage to the central nervous system will start to occur. Symptoms such as distorted blurred vision, vertigo, general tiredness, nausea and fainting can be witnessed. Dermal exposure causes a sensation of cold, followed by a burning sensation, which may lead to frostbite.

5.2.1.2 Flammability – 4: Materials that will rapidly or completely vaporize at atmospheric pressure and normal ambient temperature, or that are readily dispersed in air and which burn readily.

5.2.1.3 Reactivity – 2: Materials that readily undergo violent chemical changes at elevated temperatures and pressures.

5.3 Air Monitoring Program

5.3.1 Initial monitoring shall take place at project sites that potentially have an occupational exposure to butadiene that is covered under §1910.1051.

5.3.2 If worker exposure is at or above the PEL, air monitoring will be performed every six (6) months. Semiannual monitoring will continue until two (2) consecutive measurements taken at least seven (7) days apart are below the PEL, but above the action level.

5.3.3 Monitoring will be conducted from breathing zone air samples that are representative of each employee's average exposure to airborne butadiene.

5.3.4 Monitoring for airborne butadiene may be performed by our in-house staff, outside consultants, insurance companies or other reliable sources.

5.3.5 Monitoring for the STEL shall be repeated as necessary to evaluate exposures of employees subject to short term exposures.

5.3.6 Monitoring may be increased if:

5.3.6.1 There have been worker complaints or symptoms which may be attributable to butadiene exposure.

5.3.6.2 If additional information is discovered or observations are made which would indicate worker overexposure to butadiene.

5.3.6.3 If there is a change of equipment, process, controls, or a new type of job is added that may result in new or additional exposure to butadiene.

5.3.6.4 Whenever Brandenburg deems necessary.

5.3.7 Monitoring will be performed and samples will be collected in accordance with Brandenburg's Air Monitoring SOP (1.04)

5.3.8 Most of the exposure monitoring methods for butadiene involve the use of charcoal tubes with sampling pumps, followed by analysis of the sampled using gas chromatography (GC).

5.4 Analytical Results

5.4.1 Analytical results will be returned to the Environmental Health &Safety (EHS) Manager.

5.4.2 The EHS Manager or designee will notify each affected employee of these results either individually in writing by using the Butadiene Exposure Notification form (SAF-67) or by posting the results in an appropriate location that is accessible to employees within 15 working days after the receipt of the results.

5.4.3 Whenever PELs are exceeded, the written notification shall contain the corrective action being taken to reduce the exposure at or below the PEL.

5.5 Control Methods

5.5.1 Engineering Controls and Work Practices

Brandenburg will institute engineering controls and work practices to reduce and maintain employee exposure to butadiene at or below the permissible exposure limits to the extent feasible.

5.5.2 Respiratory Protection Program

5.5.2.1 Respiratory protection will be used, in combination with engineering controls and work practices, to maintain employee airborne butadiene exposures below the PEL.

5.5.3 Protective Clothing and Equipment

5.5.3.1 Personal protective clothing and equipment (PPE) shall be worn where appropriate to prevent eye contact and limit dermal exposure to butadiene gas or vaporizing liquid. As stated before, liquefied butadiene may result in frostbite. The level of protection selected shall be based on the potential butadiene concentration and likelihood of contact.

5.5.3.2 Brandenburg will provide protective equipment to employees and will ensure its use. Required PPE will vary by task and may include but is not limited to butadiene resistant: coveralls; gloves; hardhats; shoe coverlets; face shields; goggles. Each site's PPE requirements will be listed in the site-specific HASP.

5.5.3.3 At no time will employees be allowed to leave the work area wearing any contaminated protective clothing or equipment.

5.6 Fire Safety and Emergency Response

5.6.1 Butadiene is extremely flammable and classified as a flammable gas by both the Occupational Safety and Health Administration (OSHA) and the Department of Transportation (DOT).

5.6.2 Smoking is not permitted in areas where butadiene is stored and handled.

5.6.3 Containers of butadiene exposed to intense heat should be cooled with large quantities of water to prevent vapor pressure build up.

5.6.4 Water should be sprayed from a safe distance and until well after the fire is out.

5.6.5 For small fires a multi–purpose dry chemical powder fire extinguisher should be used.

5.6.6 Brandenburg shall utilize the customer's emergency response procedures when responding to an emergency involving butadiene. This information shall be found in the site-specific HASP.

5.7 Information and Training

5.7.1 Workers will be provided information and training at the time of their initial assignment to a work area where butadiene is present. Safety data sheets (SDS) for butadiene will be made available. If exposures are above the action level, workers will be provided with information and training at least annually thereafter.

5.7.2 Training will include hazard communication training and butadiene specific training such as medical surveillance program requirements, record keeping, and exposure records.

5.7.3 Worker medical records and exposure monitoring records will be made available upon employee request.

5.8 Observation of Monitoring

The employee or their designated representatives will be given an opportunity to observe the measuring or monitoring of employee exposure to butadiene.

6. Forms

6.1 Butadiene Exposure Notification (SAF-67)

7. Regulatory / Permit Requirements

29 CFR 1910.1051

8. Record Keeping

Air monitoring records are maintained per Records Retention Form, QUA-05 Employee medical and training records, including Exposure Notification Forms, are maintained per Employee Files, SOP and Records Retention Form, QUA-05.

Title	Date	Reference	Area
Ammonia	**07/01/2014**	**5.18**	**Safety**

1. Summary

During the course of employment, some workers at Brandenburg may become exposed to ammonia. This procedure is to advise employees in areas where ammonia is being used and to supply on an awareness level basis about the properties and hazards of ammonia, general guidelines and training requirements. This procedure has been developed in order to protect workers and prevent ammonia overexposure.

2. Scope

All applicable Brandenburg personnel and work sites where employees whose work activities may involve working with or around ammonia. When work is performed on a non-owned or operated site, the operator's program shall take precedence, however, this document covers Brandenburg employees and contractors and shall be used on owned premises, or when an operator's program doesn't exist or is less stringent.

3. Definitions

3.1 Ammonia – A toxic gas or liquid that, when concentrated, is corrosive to tissues upon contact. It is colorless gas under normal conditions. It can be a liquid under pressure. It has a pungent, suffocating odor. Exposure to ammonia in sufficient quantities can be fatal. Ammonia refers to solutions that are 50% ammonia or greater, ammonia anhydrous, and ammonia anhydrous liquefied, unless otherwise specified. Ammonia commonly exists as part of a solution.

4. Responsibility

Responsibility of personnel will be outlined within this procedure as required

4.1.1 Project Supervision

- In coordination with the Safety Manager, develop and implement ammonia awareness training.
- Ensure personnel are aware of work that has the potential of exposure to ammonia.
- Identify possible locations where ammonia in the workplace may be used.
- Inform the Safety Manager of upcoming work involving ammonia, allowing the Safety Manager to provide any necessary monitoring or other required actions.
- Ensure employees comply with the ammonia awareness requirements.

4.1.2 Employees:

- Comply with the ammonia awareness requirements and direct any questions or concerns to the Project Supervisor or Envionrmental Health & Safety Manager.
- Attend required annual training.

5. Methods

5.1 Assessments

5.1.1 Hazard Assessments

A hazard assessment will take place prior to the inception of site work activity. This hazard assessment may be in the form of an Engineering Survey, safety survey, daily safety meeting, site-specific Health and Safety Plan (HASP), Task Safety Analysis (TSA), or similar document.

5.1.2 Exposure Assessments

When necessary, Brandenburg will perform personal sampling of employees to determine worker exposure to ammonia.

Possible ways employees may be exposed to ammonia during their job functions. Some examples may include, but not limited to:

5.1.2.1 Working on/near industrial refrigeration machinery rooms, equipment and/or piping

5.1.2.2 Working in petroleum refineries

5.1.2.3 Working with/near agricultural fertilizer.

5.2 Hazards

One of the highest production-volume chemicals in the U.S., concentrated ammonia is used in manufacturing, refrigeration, and agriculture (as a fertilizer). Household ammonia is much less concentrated; it rarely causes burns, but it does cause irritation. The lowest level at which humans can detect the odor of ammonia (odor threshold) generally provides sufficient warning of exposure; however, persons with prolonged exposure to ammonia will lose their ability to detect the odor (olfactory fatigue).

5.2.1 Health Effects

Some of the potential health effects of ammonia are burning of the eyes, temporary blindness, coughing, chest pain, etc.

5.2.1.1 Exposure of the eyes to ammonia may cause burning, tearing, temporary blindness and severe eye damage.

5.2.1.2 Exposure of the skin to ammonia may cause severe burns and blistering.

5.2.1.3 Exposure of the respiratory tract (mouth, nose and throat) to ammonia may cause runny nose, coughing, chest pain, severe breathing difficulties, severe burns and death.

5.2.2 Routes of Exposure / Methods of Dissemination

Ammonia can cause harm if inhaled and/or if it comes into contact with the eyes or skin. High concentrations of ammonia gas, liquid ammonia and solutions of ammonia can cause harm if inhaled or if they come into contact with eyes or skin.

Ammonia can be released into the envirorment by different methods.

- Indoor Air: Ammonia can be released into indoor air as a liquid spray (aerosol) or as a vapor.
- Water: Ammonia can be used to contaminate water.
- Food: Ammonia is unlikely to contaminate food due to unpalatable qualities rendered to food.
- Outdoor Air: Ammonia can be released into outdoor air as a liquid spray (aerosol) or as a vapor.
- Agricultural: If ammonia is released into the air as a liquid spray (aerosol), it has the potential to contaminate agricultural products. If ammonia is released as a vapor, it is highly unlikely to contaminate agricultural products.

5.3 Control Methods

5.3.1 Engineering Controls and Work Practices

Brandenburg will institute engineering controls and work practices to reduce and maintain employee exposure to ammonia at or below the permissible exposure limits to the extent feasible.

5.3.2 Pre-job planning or a site assessment will be conducted prior to starting work and that the assessment will documented. Documented planning will be conducted for those operations involving potential ammonia exposure and this includes anytime an active purge is being applied to a system in or around equipment associated with work. Some planning or assessment elements include:

- All proposed work requires a jobsite visit to identify special precautions, equipment status and personal safety equipment requirements.
- A permit may be issued to clearly identify all hazards and special personal protective equipment requirements.
- Appropriate signage will be utilized and adhered to. Appropriate signage will include adequate warning as seen below.

5.3.3 Personal Protective Equipment

5.3.3.1 Brandenburg employees will use impervious clothing, gloves and/or face shields if there is a possibility of skin contact with liquid ammonia or vessels containing liquid ammonia.

5.3.3.2 Employees will be provided with and required to use impervious clothing, gloves, face shields and other appropriate protective clothing necessary to prevent any possibility of skin contact with liquid anhydrous ammonia or aqueous solutions of ammonia containing more than 10% by weight of ammonia.

5.3.3.3 Similar precautions should be taken to prevent the skin from becoming frozen from contact with vessels containing liquid anhydrous ammonia.

5.3.3.4 Respiratory protection will be used, in combination with engineering controls and work practices, to maintain employee airborne ammonia exposures below the PEL.

5.4 Information and Training

Employees will be aware of provisions of site specific contingency/emergency plans. Employees will be aware of owners' contingency plans and provisions. Employees must be informed where ammonia is used in the host facility and aware of additional plant safety rules.

Brandenburg shall provide training for all affected employees including any Brandenburg employee working with or near ammonia and the training shall emphasize:

- The characteristics of ammonia
- The hazards of ammonia
- Proper PPE
- Owner / Customer requirements

Documentation of training - Ammonia awareness training shall be documented including dates of training, location of training, employee name and trainer name.

5.5 Observation of Monitoring

The employee or their designated representatives will be given an opportunity to observe the measuring or monitoring of employee exposure to ammonia.

6. Forms

None

7. Regulatory / Permit Requirements

None

8. Record Keeping

Air monitoring records are maintained per Records Retention Form, QUA-05 Employee medical and training records, including Exposure Notification Forms, are maintained per Employee Files, SOP and Records Retention Form, QUA-05.

Table of Contents

SAF-03	Safety Handbook Orientation
SAF-16A	Physicians Written Opinion.Asbestos
SAF-16B	Physicians Written Opinion.Respirator
SAF-16C	Physicians Written Opinion.Cadmium
SAF-16D	Physicians Written Opinion.Inorganic Arsenic
SAF-16E	Physicians Written Opinion.Lead
SAF-16F	Physicians Written Opinion.Hazardous Waste
SAF-17	Structural Pre-Setup Safety Inspection
SAF-22	Confined Space Permit
SAF-24	High Voltage Permit
SAF-25	Trenching Excavation Permit
SAF-26	Scaffold Inspection Report
SAF-27	Rigging Inspection Report
SAF-28	Line Break Permit
SAF-29	Hot Work Permit
SAF-30	Critical Lift Permit
SAF-32	Asbestos Waiver of Liability Regulated Area
SAF-41	Suspended Work Platform Form
SAF-50	Task Safety Analysis (TSA)
SAF-59	Workplace Observation Card
SAF-63	Safety Task Analysis Card (STAC)
SAF-64	Emergency Evacuation Drill Report

This is a partial list of commonly used forms attached for your reference. For safety forms not listed above, contact the Environmental Health & Safety (EHS) Administrator directly at dreren@brandenburg.com or 312.528.1130.

OR, you may access all BISCO safety forms by logging onto the SharePoint Safety site at:

http://ilprod01sp.brandenburg.info/safety/SitePages/Home.aspx.

Brandenburg Industrial Service Company
Safety Handbook

Brandenburg®

Table of Contents

1. Introduction to Safety
2. General Policies
3. Behavior-Based Safety Programs
4. Personal Protective Equipment (PPE)
5. Specialized Work
6. Work Area Controls
7. Color Coding
8. Housekeeping
9. Working Around Equipment
10. Operation of Equipment
11. Working Around Cranes
12. Rigging
13. Fall Protection
14. Aerial Work Platforms (AWP)
15. Ladders
16. Scaffolding
17. Hand and Power Tools
18. Torch Usage
19. Compressed Gas Cylinders
20. Electrical Safety
21. Control of Hazardous Energy
22. Fire Prevention and Protection
23. Safe Lifting
24. Working Over or Near Water
25. Operators
26. Truck Drivers
27. Shop Workers
28. Heavy Metals
29. Hygiene
30. Bio Hazard Exposure
31. Hazard Communication

1. Introduction to Safety

Welcome to Brandenburg! You are now part of a team who is widely recognized as an industry leader in safety. Brandenburg has had a successful safety program because we demand individual participation at all levels of our organization. Providing a safe work environment is top priority when it comes to protecting our most valuable resource…you!

Brandenburg has been approved by the U. S. Department of Labor‘s Occupational Safety and Health Administration (OSHA) to participate in their Voluntary Protection Programs (VPP) Mobile Workforce Demonstration for Construction at the Star level. Participants in this program are selected because of their strong commitment to their employees’ safety and health. VPP works to ensure that participants have developed the best safety and health programs for their respective industries; in Brandenburg’s case, demolition and industrial services. Pursuant to the OSH Act, employees are protected from discrimination for filing a safety and health complaint or reporting work-related injuries and illnesses.

Mission Statement:

Implement safe, environmentally responsible, cost effective methods which deliver the best attainable combination of remediation, demolition and site preparation services consistently and predictably.

Vision Statement:

Continuously improve remediation, demolition and site preparation methods to assure that the best attainable solutions are delivered to our customers, our employees, the public, and the environment.

Quality Policy:

Brandenburg is committed to implementing and maintaining our Quality Management System to consistently meet or exceed customers’ requirements for quality products and services that meet all key quality objectives. Brandenburg’s commitment is to deliver and continually improve quality products and services that we provide to our customers. Brandenburg’s quality procedures and standard operating practices are in accordance with applicable industry and regulatory requirements. Brandenburg’s high level of performance is ensured by its continuous training of qualified personnel.

The ultimate goal in our accident prevention program is "zero" injuries and no lost work-time. However, there are many barriers to achieving this goal, the most important of which is the human attitude. Most people feel that "it won't happen to me" or "it couldn't happen here."

You can do more to protect yourself, your co-workers, other contractors and members of the public by constantly thinking and practicing accident prevention….. than you can by memorizing all of the rules, regulations, and safeguards ever written or invented. You must **THINK** before you act.

2. General Policies

Brandenburg performs all work safely. You must do your part to ensure that work is done properly and safely. Brandenburg has developed safety rules to protect you, the worker. All Brandenburg employees must comply with safety rule requirements. Besides the general policies and safety rules as set forth in this handbook, safety requirements for each Brandenburg project will be addressed in a site-specific Health and Safety Plan (HASP). When a conflict exists between a general rule and a site-specific HASP requirement, the more stringent or protective rule/requirement will apply.

You must obey **ALL** company policies and safety rules or **YOU WILL NOT WORK HERE.**

Disciplinary Action

Any employee who fails to comply with Brandenburg's policies and safety program or any additional customer safety rules and requirements, either by choice or by negligence, shall be disciplined according to Brandenburg's Disciplinary Action Policy. Disciplinary Action may include verbal or written warning, suspension or immediate termination.

Physical and Mental Condition

You are required to report to work in a condition to work safely. Reducing accidents means reporting to work physically and mentally rested, prepared to perform your job safely and properly. You will not be allowed to work if you are under the influence of alcohol, intoxicants, or controlled substances. If you are taking a prescribed drug which may have a side effect, inform your Supervisor **before** beginning the day's work.

Personal Conduct

Gambling, fighting, and horseplay or other activities which could create a distraction or hazardous condition are prohibited. The possession of illegal drugs, alcohol, weapons and firearms is prohibited.

Cameras and Recording Devices

Unless authorized by your Supervisor for Brandenburg's use, the use of cameras and personal audio / video recorders, including cell phones in picture, audio or video record mode, is strictly prohibited.

Cell Phone and Electronic Media Usage

Unless authorized by your Supervisor for Brandenburg's use, the use of cell phones, media players and other types of electronic communication devices is strictly prohibited during working hours in any Brandenburg facility or on any Brandenburg project site. Texting and personal phone calls are only allowed during scheduled breaks in non-working areas

Theft

Taking possession of any Brandenburg, customer or another person's property without that person's consent is considered theft. The act of "theft" can be used interchangeably with any of the following, but not limited to, burglary, embezzlement, robbery, fraud, falsifying company records, etc… Theft, in any form, will not be tolerated by Brandenburg. Brandenburg reserves the right at any time and at its discretion to search all company-owned or leased vehicles and all vehicles, plus packages, containers, briefcases, purses, lockers, desks, enclosures and persons entering company or customer property.

Drug and Alcohol Testing

You will be tested for intoxicants and drugs as per Brandenburg's and/or Customer's Drug & Alcohol Policies. Refusal to submit to testing will be considered a positive test result. A drug screen may be required anytime an employee is involved in an accident or a near miss.

First Move Forward Policy

Vehicles parked in Brandenburg's yards or project limits shall be parked in a manner to "First Move Forward." Company or privately owned vehicles shall be backed into spaces or parked in a manner that allows the driver to begin driving in a forward direction.

Parking

Parking on Brandenburg property or on any of Brandenburg's jobsites is at your own risk. Vehicle parking on any Brandenburg jobsite or property is provided for your convenience. The company assumes no responsibility for loss, theft or damage to parked vehicles or vehicle content on Brandenburg property or worksites.

Accident Reporting

If you are involved in an accident, no matter how minor, immediately report it to your Supervisor. If you require medical attention, your Supervisor will arrange for transportation to the nearest medical treatment facility or ensure first-aid treatment is provided on-site by a qualified person.

Stop Work Authority

It is the responsibility of every employee to work safely. Brandenburg Industrial Service Company has established safety policies and procedures that require safe work behaviors and empower individuals to directly participate at all levels. Stop Work Authority is the ability for every employee to stop a task, notify his or her Supervisor, implement corrective action and resume work.

This Stop Work Authority ensures our employees have the authority and responsibility to stop any task or operation where concerns or questions regarding the control of Health & Safety exist.

Stop Work Authority empowers ALL employees to suspend tasks and operations when:

- An unsafe act, condition or error is observed;
- Environmental, Health or Safety (EHS) risk is not clearly recognized;
- An employee does not understand his or her work task, or
- Required tools and / or equipment is not available

When an unsafe condition or act is identified, a Stop Work process will be initiated and coordinated through the Supervisor. All affected personnel will be notified of the Stop Work concern, and the issue corrected prior to resuming work.

Management and Supervision are responsible for ensuring a culture where Stop Work Authority is exercised and honored without any form of retribution or intimidation directed at any employee for exercising his or her authority.

3. Behavior-Based Safety Programs

Behavior-based safety provides the foundation for Brandenburg's solid corporate safety culture. We empower our employees to become involved in their own day-to-day safety by encouraging their participation in our injury prevention program. We realize that employee involvement, including education and training on how to identify and eliminate at-risk or unsafe behaviors is the key to continuously improving our safety program.

Safety Task Analysis Card Program (STAC)

Safety Task Analysis Cards (STAC) are completed daily by all employees prior to the start of work and also prior to starting new tasks. Employees are required to identify the possible hazards associated with the task they will be performing, in addition to identifying the measures they will be implementing to either eliminate or control those hazards.

Workplace Observation Cards (WOC)

Workplace Observation Cards (WOC) are used by employees to document both safe and unsafe behaviors observed on our job sites. The completion and submittal of these cards is voluntarily and provides an avenue for our employees to report hazards anonymously, if they so choose. Self-addressed, self-stamped envelopes are included with all WOCs and are mailed by the employee directly to the corporate office.

Safety Incentive Award Program

Brandenburg encourages our hourly employees to become more involved in day-to-day safety by providing a vehicle in which they can provide, in their own words, workplace observations and recommendations for improvement. Eligible Workplace Observation Card (WOC) entries include those which a) identify fault in a current practice, b) suggest improvement to a current practice, c) identify a practice which should be implemented, or d) identify any obstacle to working safely.

Safety Committee

Membership in the Safety Committee is voluntarily and includes members from every level of our organization. The Committee may assist with the following activities: the investigation of workplace incidents, the assessment of root causes previously identified and corrective actions implemented, the evaluation of current safety policies and procedures and recommendations for the continuous improvement of Brandenburg's safety program. The Committee also reviews all Workplace Observation Cards entries and subsequently determines our Safety Incentive Award winners.

4. Personal Protective Equipment (PPE)

Personal safety equipment that is provided for your protection must be kept in good condition. Report to your supervisor if it is lost, damaged, or malfunctions as soon as possible. Clothing shall be suitable and appropriate for the hazard involved, the weather, and the duties performed. Be aware that torn or loose clothing, cuffs, and oily clothes are hazardous. The wearing of rings or other jewelry is not recommended on the job, particularly if working around moving or rotating parts.

Minimum PPE Requirements

You will be required to wear PPE (PPE) for all jobs. At a minimum, the following PPE must be worn at all times in the work area:

Head Protection

Approved hardhats. Employees having less than one (1) year of experience with Brandenburg will don yellow hardhats. Employees with more than one (1) year of experience will don brown hardhats.

Eye Protection

Safety glasses (ANSI Z87 approved)

Whole Body Protection

Long pants and sleeved (minimum 4") shirts made of cotton or natural fiber clothing.
NOTE: Certain sites/customers require long sleeved shirts.

Gloves

A properly selected work glove is required for most job tasks. Brandenburg utilizes a Cut Level 3 work glove as a minimum. Other work activities, such as performing hot work, chemical handling, or vibrating equipment, may require a specialized glove.

Foot Protection

Safety-toe (steel toe / composite) protective footwear supporting the ankle

Site specific PPE Requirements

Depending on the work activities, different types of safety equipment and PPE may be required.
For example:

- Metatarsal protection is required as per Task Safety Analyses (TSA) and site-specific Health & Safety Plans (HASP).

- Proper eye protection must be worn at all times. Site or task specific hazards which would require the use of safety goggles, spoggles (foam lined safety glasses) or face shields include flying objects, dust, hot or splashing metals, harmful rays, caustics or acids.

- NIOSH approved respiratory protection equipment shall be worn at all times when the worker is exposed to inhalation hazards above regulatory limits. Employees wearing respirators must be clean shaven.

- Reflective high visibility vests will be worn when working in close proximity to vehicular traffic and while working around heavy equipment.

- Fire retardant clothing (FRC), Tyvek® suits or other whole body protection may be required for certain hazards or projects.

You will receive special training or instruction prior to using specialized PPE. Even though you may have worn a respirator or other PPE for a previous employer you cannot wear a respirator or other specialized PPE until Brandenburg has authorized you to do so. Before Brandenburg will allow you to wear PPE, we will confirm your training, qualifications, and, in the case of respirators, ensure that you have successfully passed a recent fit test.

5. Specialized Work

You may observe that some of your more experienced co-workers are performing specialized work. This specialized work requires specialized training. You cannot perform this specialized work until you have successfully completed specific training or other requirements and have authorization from Brandenburg. Work that requires specialized training includes, but is not limited to:

Confined Spaces

A confined space is a space that is large enough and configured so that an employee can enter and perform work, has limited or restricted means of entry or exit, and is not designed for continuous occupancy. Examples of confined spaces may include; tanks, vessels, pits, or vaults. Never enter a confined space (break the plane), unless you have received specific training and authorization to do so.

Asbestos

You may encounter signs that indicate that asbestos is being removed. You must avoid these areas. You are not allowed to touch, handle, or be in the work area where asbestos work is taking place without specific training <u>and</u> authorization to do so.

Trenching and Excavation

Do not enter any trench or excavation greater than five (5) feet deep unless authorized by your Supervisor. Trenches five (5) feet deep or greater require a protective system unless the excavation is made entirely in stable rock. Protective systems can include: Benching, Sloping, Shoring, or Shielding.

- When trench or excavations that are four (4) feet deep or greater, a safe access and egress must be provided. This includes, but is not limited to: ladders, steps, or ramps. These devices must be located within 25 feet of all workers

- Keep excavated soil (spoils) and other materials at least two (2) feet from trench edges

- Employees shall not work in excavations in which there is accumulated water

- Know where underground utilities are located before digging

- The competent person shall inspect trenches at the start of each shift, following a rainstorm, or after any occurrence that could have changed conditions in the trench

Handling Hazardous Chemicals

All workers will be informed of any potential exposure to hazardous chemicals. Do not work with any chemical until you have received proper training. To perform hazardous waste work, you will need specialized training above and beyond hazard communication.

6. Work Area Controls

Only authorized personnel are allowed in Brandenburg work areas. When in the area, you must obey: pedestrian and traffic controls, road closures, barricades, signs and railroad track controls.

7. Color Coding

Color codes are utilized to indicate hazards during the demolition of structures. No structure or section of structure will be demolished that has been color coded with red paint. Red means **STOP**; Green means **GO**.

Color coding is sometimes used to mark utilities. If an outlet or electrical panel is painted **red**, this means that it may be “live”. **Green** indicates “dead” or disconnected. Contact your Supervisor or utility personnel to verify.

8. Housekeeping

Good housekeeping is an essential part of every job. Work areas, aisles, walkways, and equipment shall be kept clear of loose materials, tools, and scraps. Spills such as grease, water, or oil shall be cleaned up as soon as possible; a delay could result in an accident to you or a fellow worker.

A safe access to work areas shall be maintained. Short cuts should be avoided. Never block aisles, traffic lanes, or fire exits with equipment or materials. All emergency exits, passageways, and stairs shall be kept clear and free of debris.

If you observe an unsafe condition in your work area, you must fix the problem or “make safe” the situation. If you cannot make the area safe, inform your Supervisor of the hazard immediately.

9. Working Around Equipment

Your job duties will require you to work around various types of equipment. When you are working around moving equipment, you must let the operator know where you will be working, and maintain a safe distance. This can be accomplished via radio contact, eye contact or both. All employees working at ground level, around heavy equipment, must wear a high visibility vest.

Do not work under raised equipment components such as buckets or lift arms on truck bodies, unless the components are properly braced, secured or supported.

When working on projects involving vehicular traffic hazards, you must wear a high visibility vest and be aware of traffic and heavy equipment. When determined by the Supervisor to be necessary, a flag person or signal device will be used to direct traffic.

10. Operation of Equipment

You must be trained, qualified and authorized to operate **ANY** type of equipment at Brandenburg. Do not operate manlifts, forklifts, bobcats, or any other equipment (even if you may have done so at a previous employer) without authorization. When seatbelts are available, they must be worn.

The use of headphones, cell phones (for talking or texting), or other mechanical devices which obstruct hearing and cause distractions while operating company equipment are prohibited.

All mobile equipment/vehicles with obstructed rear view, with the exception of passenger cars, will be equipped with back up alarms.

When mounting or dismounting equipment, ALWAYS follow the "3 point contact" rule: 2 feet & 1 hand; <u>or</u> 2 hands & 1 foot.

When equipment or machines are operated near overhead power lines, special precautions will be taken:

For lines rated 50 kV or below, minimum clearance between the lines and any part of the equipment or load shall be ten (10) feet. For lines rated over 50 kV, minimum clearance between the lines and any part of the equipment or load shall be ten (10) feet plus 0.4 inch for each 1 kV over 50 kV, or twice the length of the line insulator, but never less than ten (10) feet.

When driving a company vehicle, follow all laws and applicable regulations. Ensure you and your passengers are wearing seatbelts. Any safety problem with a vehicle must be reported immediately. Riding on equipment or riding in the bed of pickup trucks is prohibited.

11. Working Around Cranes

- Assembly/disassembly of cranes must be directed by a person who meets the criteria for both a competent person and a qualified person
- Cranes must be set up on ground conditions that are firm, drained, and graded
- The minimum clearance distance for cranes working around power lines up to 350 kV is 20 feet. If this cannot be obtained, or the power lines are more than 350 kV the Environmental Health and Safety (EHS) Manager must be contacted for further evaluation
- Never enter the swing radius of the crane; erect and maintain control lines, warning lines, railings or similar barriers to mark the boundaries of the hazard areas
- No employee will be within the fall zone, except the qualified rigger. No employee shall be directly under any load.

- Crane suspended personnel platforms will be used only if there is no other safe means of access to the work area

- The procedures applicable to the operation of the equipment, including rated capacities (load charts), recommended operating speeds, special hazard warnings, instructions, and operator's manual, must be readily available in the cab at all times for use by the operator

- The equipment shall not be operated in excess of its rated capacity.

Crane Inspections

- Post-assembly – Upon completion of assembly, the equipment must be inspected by a **qualified person** to assure that it is configured in accordance with manufacturer equipment criteria

- Each shift – A **competent person** must begin a visual inspection prior to each shift the equipment will be used, which must be completed before or during that shift

- Monthly – Each month the equipment is in service it must be inspected by a **competent person.** Documentation of the inspection must include: the items checked and the results of the inspection; the name and signature of the person who conducted the inspection and the date; and document must be retained for a minimum of three months

- Annual/comprehensive – At least every 12 months the equipment must be inspected by a **qualified person.** Documentation of the inspection must include: the items checked and the results of the inspection; the name and signature of the person who conducted the inspection and the date; and document must be retained for a minimum of 12 months

Signals

- Signals to the crane operator can only be given by a person who has passed both a written and practical test

- Signals to operators must be by hand, voice, audible, or new signals

- If hand signals are used the standard method must be used

- If radios are used the operator and signal person must be on dedicated channel

- Only one person may give signals to a crane at a time

- Hand signal charts must be either posted on the equipment or conspicuously posted in the vicinity of the hoisting operations

12. Rigging

Rigging is the process of lifting and moving loads with slings, hooks, shackles, eye bolts, etc. The lifting of these loads is typically used with a crane, but Brandenburg also uses other equipment such as, but not limited to, excavators, loaders, tuggers, and chain hoists. Qualified riggers oversee all rigging tasks performed on Brandenburg jobsites.

The following are some basic rules to keep you and others safe while rigging loads:

- All rigging slings, hardware, and ancillary devices will be inspected before each work shift; defective rigging will be tagged and removed from service

- All rigging equipment must have a permanently affixed and legible identification markings as prescribed by the manufacturer that indicate the recommended safe working load

- Rigging equipment SHALL NOT be loaded in excess of its recommended limit

- Use padding or softeners to protect slings from sharp surfaces

- Makeshift devices are NOT to be used to rig any loads

- Never place hands or fingers between a sling and load while the sling is being tightened around the load

- Never work under a suspended load.

- Use tag lines to guide the load

- Never wrap a tag line around your hand or any other part of your body.

- Never pull a sling from under a load when the load is resting on the sling, use cribbing under the load

13. Fall Protection

Each employee on a walking/working surface with an unprotected side or edge which is six (6) feet or more above a lower level shall be protected from falling by the use of guardrail systems, personal fall arrest systems (PFAS) or hole covers.

Use at least one of the following whenever employees are exposed to a fall of six (6) feet or more above a lower level:

- Guardrail Systems - the top rail shall be 42 inches (plus or minus 3 inches) above walking/working level, and be capable of withstanding 200 pounds of force. The midrail shall be installed halfway between the top edge and the walking/working surface;

- Hole Covers - cover or guard floor holes as soon as they are created. Construct all floor hole covers so they will effectively support two (2) times the weight of employees, equipment, and materials that may be imposed on the cover at any one time, make sure the cover is secure, and either color code the cover or mark the word “HOLE" or "COVER" to provide warning of the hazard; or

- Personal Fall Arrest Systems (PFAS)

14. Aerial Work Platforms (AWP)

Aerial Work Platforms (AWP) typically consist of boom lifts and scissors lifts. They are used to reach and perform work on elevated structures. You must be trained, qualified, and authorized by your Supervisor to operate any AWP. Spotters or ground watch person(s) may be required and are used to guide operators and warn of any potential hazards when working on certain projects.

When operating an AWP you MUST:

- Inspect the AWP before each shift and document on Brandenburg Inspection Log

- Test the lift controls (platform and ground) to determine that such controls are in safe working condition

- Wear a full body harness with a Self Retracting Lifeline (SRL) attached to the approved anchorage point

- Stand firmly on the floor of the basket, and shall not sit or climb on the edge of the basket or use planks, ladders, or other devices

- Not use the machine for any purpose other than position personnel, their tools, and equipment

- Always ensure that tools are properly stowed and never left hanging by cords from platform

- Not use the AWP as a crane

- Not elevate platform or drive with platform elevated while on a sloping, uneven, or soft surface

15. Ladders

Use only approved ladders (fiberglass) that you can place on a firm, level base. Wood and aluminum ladders are not to be used on any project.

When using ladders, the following rules must be adhered to:

- Inspect the ladder prior to use. If the ladder is dirty, oily, or greasy -- clean it prior to use. If the ladder is missing its safety feet or has bent or broken rungs, frame or members -- do not use it. Report any defective ladder to your Supervisor.

- Straight ladders must be placed at the proper angle

- The base of the ladder must be ¼ of the height. For example, if the ladder extends upward on a wall that is 12 feet tall, the base of the ladder should be approximately three (3) feet from the wall. The ladder should reach at least three feet above the landing.

- Ladders shall be kept from slipping or tipping by securing the ladder

- Face of the ladder while climbing and use both hands.

- Lift equipment and materials with a rope specifically for that purpose – DO NOT carry equipment or materials up a ladder with one hand.

- Always follow the “3 point contact” rule: <u>maintain three points of contact at all times</u>:
    - Two feet and one hand, or one foot and two hands, on the ladder when climbing it
    - Two feet and one other point of contact with the ladder while working from it, such as one hand or the upper torso leaning against the ladder.

- An “A” frame ladder must be used in the fully open, “A” position. All ladders should be on level footing and properly secured.

- Never stand on the top two rungs of an A-frame ladder, unless it is designed for it. This could cause you to become off-balance resulting in a fall.

- When working off of a ladder, do not reach in either direction to the point where your belt buckle extends outside of the framework of the ladder.

16. Scaffolding

While working with Brandenburg, you may be required to work from scaffolding. Brandenburg uses scaffolding as temporary elevated platforms to perform many tasks such as, but not limited to, removing lights and ballasts, working adjacent to structures and building containments. You will receive additional training before you can erect or dismantle scaffolds.

When using any scaffold, the following guidelines must be followed:

- Scaffolds **MUST** be inspected by a competent person before each work shift
- Scaffolds and scaffold components will be capable of supporting, without failure, its own weight and at least four (4) times the maximum intended load applied or transmitted to it
- Footing must be level, sound, rigid, and capable of supporting the loaded scaffold
- Scaffold poles, legs, posts, frames, and uprights should always bear on base plates and mud sills
- Scaffold platforms (where you are working from) must be fully planked with no more than a one (1) inch gap between the planks or uprights
- The front edge of all platforms cannot be more than 14 inches from the face of the work unless guardrail systems are erected along the front edge and/or PFASs are used
- Each end of a platform, unless cleated or otherwise restrained by hooks or equivalent means, needs to extend over the centerline of its support at least six (6) inches
- When a scaffold has a height to base width ratio of more than four to one (4:1) it will be restrained from tipping by guying, tying, bracing, or equivalent means
- Unstable objects, such as boxes, barrels, or ladders shall not be used as working platforms or to increase the working level height of employee
- When accessing a scaffold that is two (2) feet above or below a point of access, portable ladders, hook-on ladders, attachable ladders, stair towers, integral prefabricated scaffold access, or direct access from another scaffold, or similar surface shall be used. You can **NEVER** use crossbraces as a means of access
- Fall protection on scaffolds consists of guardrails or PFAS
- The use of toeboards, screens, or barricading the area below must be used for falling object protection. It is your responsibility to keep debris from accumulating on scaffolds
- Caster stems and wheel stems shall be pinned or otherwise secured in scaffold legs or adjustment screws
- Scaffold casters and wheels shall be locked with positive wheel and/or wheel and swivel locks, or equivalent means, to prevent movement of the scaffold while the scaffold is used in a stationary manner

- The clearance between scaffolds and power lines shall be as follows:

Insulated lines	< 300V	3' minimum distance
Insulated lines	>300V to <50 kV	10’ minimum distance
Insulated lines	> 50kV	10' plus 0.4” for each kV over 50kV
Uninsulated lines	< 50kV	10'
Uninsulated lines	> 50kV	10' plus 0.4" for each kV over 50kV

17. Hand and Power Tools

Always know how to properly use hand and power tools before starting the job by following operating instructions and using the proper accessories. If you are unfamiliar with how a tool operates or is to be used, get the guidance and instruction of your Supervisor. When using hand and power tools, always follow the rules below:

- Use the right tool for the job; tools should not be used for other than their intended use.
- Inspect tools before each use. Tools shall be kept in a safe condition without broken or damaged parts. Never use tools which have burred or mushroomed heads and never carry loose tools in your pockets. If tools or equipment are found to be faulty, do not use them. Report all faulty tools or equipment to your Supervisor.
- Safety guards must never be removed when a tool is being used.
- When using an angle grinder, check to ensure that the guard and handles are secure, verify the correct disk is being used for the speed of the grinder, and inspect the tool to ensure there are no defects or damage to the disk or the tool.
- Hose connections (compressed air tools) will be inspected daily, and all connections secured with safety clips or wire.
- Never leave hand tools lying around loose where they may fall on someone below.
- Ground fault circuit interrupters (GFCI) must always be used with power tools and electrical cords.
- Electrical cords on power tools and extension cords shall have heavy-duty rubber insulation
- Electrical power tools shall be grounded or double insulated
- Only self-retracting utility knives or Klever Kutters are authorized for use

18. Torch Usage

Cutting torches are one of the most important and most often used tools at Brandenburg. Cutting torches can also cause injury, if not operated properly. Injury can occur not only from the flame or heat from the torch, but also from: falling materials, hot metal fragments or fumes produced during torch cutting. Keep a safe distance from cutting torch operations unless you have received specific training.

Prior to being allowed to use a torch, you will be trained on a torch's proper operation. Do not attempt to operate a torch (even if you may have used a cutting torch at a previous employer) until you have received instruction and authorization from your Field Supervisor.

Always follow the rules below:

- Approved eye and full body protection, including welding shields with safety glasses worn underneath, fire retardant clothing (FRCs), and gauntlet style gloves are required.
  Synthetic material is prohibited.
- Proper eye protection shall be worn when observing welding or torch cutting operations.
- Inspect torch and hoses for defects prior to each use
- Always use soapy water instead of matches to check for leaks in hoses, fittings, and valves in welding equipment.
- Oxygen/ fuel torch units shall be lit with proper ignition equipment and not with matches or cigarettes.
- Localized ventilation shall be used when necessary.
- Proper fire extinguishers shall be immediately available.
- Oil in any form shall be kept away from sources of oxygen.
- Only approved torch hose repair kits shall be used

19. Compressed Gas Cylinders

Compressed gas bottles can be extremely dangerous if not handled properly. Accidents can occur when the heads of these cylinders are broken off or the cylinders are damaged.

Always follow the rules below:

- Bottles must be secure and upright at all times.
- Cylinder valves shall be opened slowly to avoid valve damage
- Cylinders shall be transported only on cylinder carts
- At the end of the shift, all gauges must be removed, and any pressure from lines released.
- Valve caps must be on bottles when not in use.
- Store oxygen and flammable gas a minimum of 20 feet apart, or on the opposite sides of a one-half hour fire rated wall.
- Never store propane gas bottles inside a building.
- Never transport cylinders from the work site with gauges on bottles.

20. Electrical Safety

Brandenburg personnel may be exposed to electrical hazards. Common exposures include the use of electrical tools or equipment in low voltage receptacles. Some employees, however, may be exposed to high voltage electrical hazards. Only qualified workers are authorized to work on high voltage or perform electrical work involving live power. Proper training and qualifications are required for electrical work. ALWAYS follow the rules below:

- Only qualified workers are permitted to work on or near live electrical parts, and only after a hazard assessment has taken place prior to the inception of the work.
- The qualified person will review and approve task control methods. These methods include the PPE requirements, circuit isolators (barriers), circuit insulators (blankets), grounding, or any combination of the four.
- Work practices such as Lock-Out / Tag-Out, recognizing de-energizing parts, safe work clearances, and other related practices to prevent the risk of electric shock shall be used by non-qualified persons.
- All exposed electrical wires should be considered "hot" or "live" until verified by an electrician or utility foreman.
- No electrical work should be performed "hot" when it can be done "cold".
- All electrical equipment should be periodically inspected. Suitable means should be provided for identifying all electrical equipment and circuits, especially if two or more voltages are used on the same job.
- Only an electrician or utility foreman shall make electrical repairs or electrical installations.
- A ground-fault circuit interrupter (GFI) shall be installed in the circuit to prevent electrical shock.
- Employees shall inspect cords for damage prior to use.
- Cords shall be protected from damage when passing through doorways, pinch points, sharp corners or projections.
- Spliced or damaged electrical cords shall not be used.
- You should never use electrical equipment when standing in or near water.

21. Control of Hazardous Energy

Energy systems include, but are not limited to, piping, electrical conduits, electrical circuits, communication circuits and associated equipment. Hazards associated with energy systems include cutting into, damaging or otherwise compromising active energy systems which were not properly disconnected and/or purged. Do not “break” any line that is pressurized, or contains any chemical.

Brandenburg employees who remove, cut or otherwise compromise any potentially live energy system must comply with Brandenburg’s Lock-Out /Tag-Out (LOTO) or Identification & Marking, Isolation and Purging procedures, as applicable.

Lock-Out / Tag-Out (LOTO)

You should **NEVER** adjust, repair, clean, or oil machinery or equipment while any of its parts are in motion. This lock-out/tag-out procedure should reduce accidents caused by the unexpected start-up or release of energy.

Before starting maintenance or repair, the equipment should be checked to make sure all energy has been released or disconnected. A lockout device and universal “Danger” tag shall be placed on the junction box of stationary, permanently wired equipment with the Energy activation device placed in the “off” position. The operator or mechanic shall write the reason(s) the machine is not operable on the tag and sign it before placing the tag on the equipment.

If you see a “Do Not Operate” tag or a lock, do not turn on or operate the equipment. Only an authorized mechanic or operator should remove its tag after the equipment is repaired and notify affected personnel. When more than one trade is involved in repair or maintenance of such equipment, a compound locking device shall be used. Each worker involved shall apply their own lock and personal tag. The equipment shall not be put back in service until after the last worker removes its lock and tag.

Identification & Marking, Isolation and Purging

1. Identify and visibly mark the complete extent of the energy system which is to be removed. Visible markings must be close enough together so that a removal mark can be seen from any location on the system. Remember our marking system:

GREEN = GO - Safe Cut - Remove

RED = STOP – DANGER! Preserve – Retain – Do Not Remove

2. Isolation

Follow every component, branch and leg of the energy system to be removed. Determine that a visible separation (air gap) completely isolates every branch or leg of the system to be removed.

3. Purging

Identify the previous content of any piping system or machine to be removed. If the former contents are potentially hazardous, toxic or flammable:

A. Identify and implement appropriate PPE.

B. Identify and implement removal equipment and methods which do not initiate any unanticipated chemical reaction

C. Identify, open and drain every low point, connection and valve which may cause an unanticipated accumulation of pipe contents.

22. Fire Prevention and Protection

The elimination of fire hazards is an integral part of fire prevention. Whenever feasible, combustible materials shall be removed prior to the initiation of hot work activities or other operations which constitute a fire hazard.

Flammable and combustible liquids shall only be stored and handled in approved containers. Smoking shall be prohibited in the vicinity of operations which constitute a fire hazard and “No Smoking” signs should be posted.

There are four (4) classes of fire extinguishers:

- Class A extinguishers are for fires involving wood, paper cloth, or ordinary combustible materials.

- Class B extinguishers are used for fires that involve flammable or combustible liquids such as gasoline, oils, and certain other liquids.

- Class C fire extinguishers are for use on fires caused by energized electrical equipment such as from wires, circuit breakers or fuse boxes.
- Class D extinguishers are designed for fires involving combustible metals, such as magnesium, titanium, or sodium

Portable fire extinguishers will be readily available for immediate access by all personnel for use in case of an emergency. Fire extinguishers shall be inspected on a monthly basis. Brandenburg employees shall be trained on the proper use of portable fire extinguishers in order to properly extinguish incipient types of fires.

Refueling a small engine that is running or that is “hot” can be dangerous and should be avoided. Always clean up spills that occur during refueling before re-starting engines. Rags that contain oils or solvents shall be kept in covered metal containers until they can be safely disposed of.

Remember the “P – A – S – S” method when using a fire extinguisher.

Pull the Pin

Aim at the base of the fire

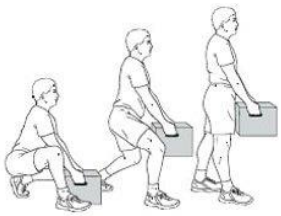
Squeeze the lever

Sweep side to side

23. Safe Lifting

Proper methods of lifting and handling protect against injury, and make work easier. You need to “think” about what you are going to do before bending to pick up an object. Over time, safe lifting techniques will become a habit.

- Plan the lift - test the load before lifting and know where you are going
- ALWAYS stand close to the load
- Place one foot firmly alongside the load to be lifted, and the other just behind the object with your heels flat
- Bend your knees and squat down, keeping your back erect
- Keep your chin up while lifting as this helps to keep your back erect
- Grasp the load and use your leg muscles to lift the object
- Stand and lift, straightening your legs gradually from a squatting to an erect position (no jerking)



- NEVER twist your body while lifting; turn with the feet rather than twisting the trunk.
- Carry the load close to your body, keeping your back erect
- To lower the load, reverse the lifting process

<u>Always remember</u>: Get help when necessary <u>and</u> use lifting equipment <u>whenever</u> possible.

24. Working Over or Near Water

When work is done over or near water, where the danger of drowning exists, an approved U.S. Coast Guard personal flotation device shall be worn. A life saving skiff and a ring buoy with 90 feet of line will be immediately available.

25. Operators

If you will be operating heavy equipment, you must be qualified and authorized by Brandenburg. No matter what type of heavy equipment you will be operating, you must adhere to the following:

- Keep the cab of your machine clean.
- Wear your seat belts at all times.
- When mounting or dismounting equipment, ALWAYS follow the “3 point contact” rule:
    - 2 feet and 1 hand; or
    - 2 hands and 1 foot

- Complete a daily inspection report at the start of each shift. Any problems will be documented. Should the problems affect the safe operation of the equipment do not operate the equipment – report the problem to your Supervisor.

26. Truck Drivers

If you will be driving a truck, you must adhere to the following:

- Complete a Pre inspection at the beginning of each shift and a Post inspection report at the end of the shift
- When hauling light metals, garbage and/or debris, tarp the trailer prior to operation of the vehicle, when required
- Remain outside the cab during loading operations
- Ensure that the rear gate is secure
- Maintain a daily logbook as per DOT regulations
- Abide by all Federal Motor Carrier rules; including those pertaining to the ban on texting and cell phone usage.
- Always wear your seatbelt

27. Shop Workers

If you will be working in a Brandenburg shop you must adhere to the following:

- Conduct inspections of all tools and machines to be used daily or prior to use. All defects must be repaired or made safe prior to use.
- Conduct and document EOT crane inspections daily.
- Ensure abrasive wheel tools are inspected regularly. To test, wheels should be tapped gently with a light, non-metallic instrument. If a wheel sounds cracked or dead, it must not be used. A stable wheel, when tapped, will give a clear metallic “ring.”
- When using an angle grinder, ensure that the guard and handles are secure, verify the correct disk is being used for the speed of the grinder, and inspect the tool to ensure there are no defects or damage to the disk or the tool.

Bench Grinders and Abrasive Wheels

- Guards cover the spindle, nut and flange and 75% of the wheel diameter
- Work rest must be adjusted to within 1/8 inch of the wheel
- The adjustable tongue guard on the top side of the grinder must be kept to within ¼ inch of the wheel
- The maximum RPM rating of each abrasive wheel must be compatible with the RPM rating of the grinder motor.

Welding machines are very important in the fabrication shop. Welding machines can cause serious injury if not operated properly. Injury can occur not only from the sparks or heat from the welding machine, but also from: UV rays, hot metal fragments or fumes produced during the welding process. Always keep a safe distance from welding operations. Welding gloves are required for all welding operations.

28. Heavy Metals (Lead, Cadmium, Arsenic, Hexavalent Chromium)

Potential sources of metal(s) exposure to employee activities may include but not limited to: using torches to prepare scrap steel and set-up of structures for demolition (method of cutting steel members to weaken the structure in preparation for demolition), manually scraping and/or power tool cleaning painted surfaces, handling coal waste products (fly ash), handling and/or disturbing boiler refractory, various welding activities, and mechanical demolition of structures containing lead/cadmium/arsenic/hexavalent chromium-based paint.

Employees who may be occupationally exposed to heavy metals must be trained in accordance with the metal-specific standard.

29. Hygiene

Always wash your hands and face thoroughly before eating, drinking, smoking, applying cosmetics, or leaving the jobsite. When required, soiled coveralls and similar protective clothing must be placed in appropriate containers and left at work.

30. Bio Hazard Exposure

All workers should protect themselves from exposure to Bloodborne Pathogens. This includes contact with used hypodermic needles, blood, blood products or other bodily fluids. No one should perform any first aid, cleanup or otherwise contact contaminated materials unless they have received specialized training and are authorized by Brandenburg.

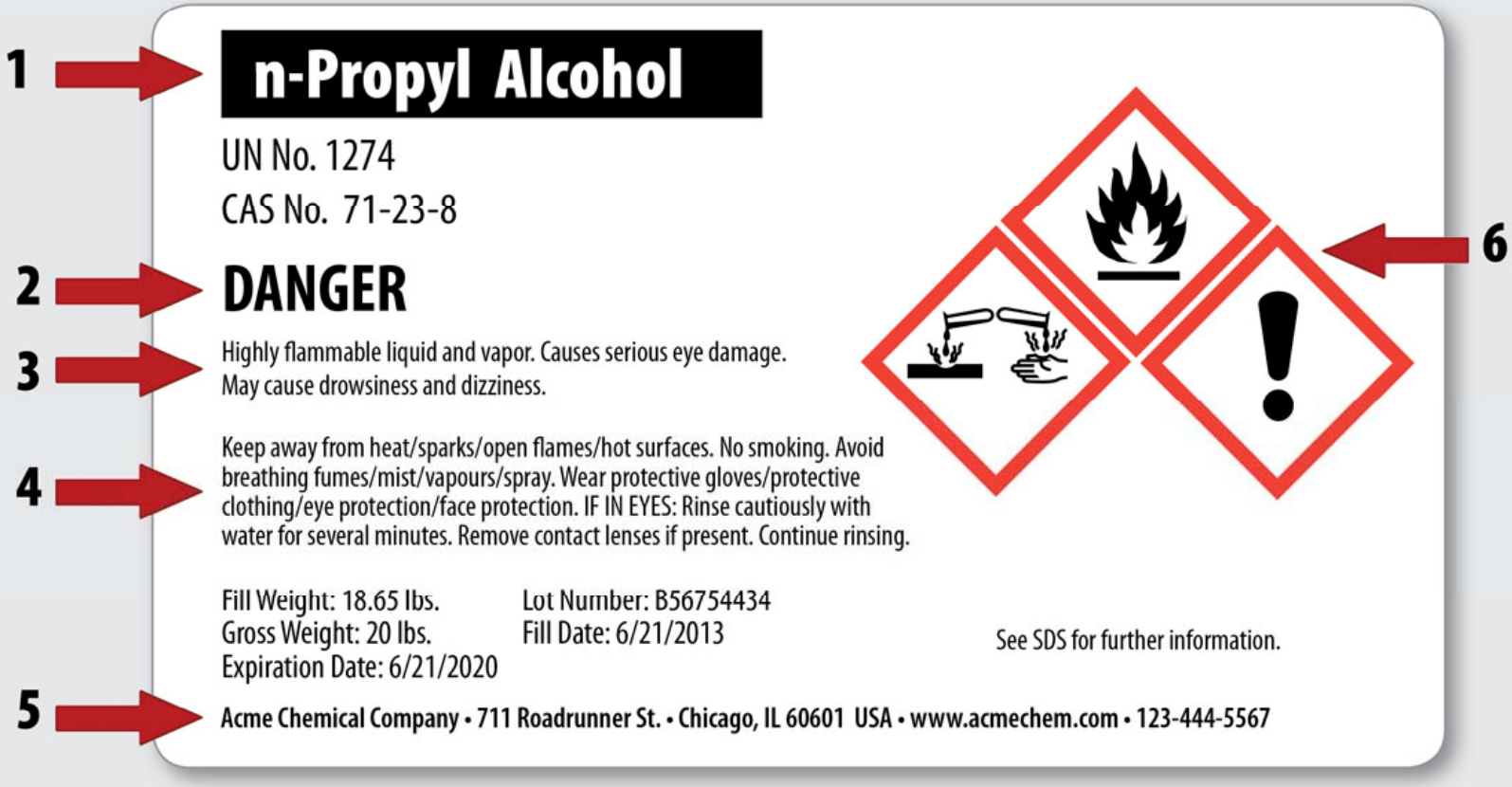
31. Hazard Communication

The purpose behind the Hazard Communication Standard is simple – to help you achieve a longer and healthier life by avoidance or protection from chemicals that you use or which you may be exposed to.
Brandenburg has a written Hazard Communication Program which is available to you. This program has a Chemical Inventory List and a Safety Data Sheet (SDS) for all materials on the list. Should you have a question about a material you are working with, ask your Supervisor.

The OSHA Hazard Communication Standard 1910.1200 requires all manufacturers or importers of chemicals to evaluate their products, and to communicate all information and associated protective measures to all users by means of Warning Labels on their containers. This label will be your initial warning, it should tell you what the physical and health hazards are of the material in the container. Also, the Standard requires manufacturers to provide SDS, which list more detailed information about the chemical. A SDS will let you know what chemicals are in a product and what steps to take to protect yourself when using the product.

All employees have the right to know the chemicals they are being exposed to in the workplace. Brandenburg accomplishes this through site specific training, Labeling and the use of SDS. SDS are available to all employees upon request, or may be found with the jobsite safety information.
Remember, it is your health and life that is on the line. Most chemicals that you are exposed to can be handled and used safely with the proper knowledge and protection – misuse can lead to cancer, heart ailment, lung and skin disorders, sterility, burns, etc….even death.

The Basic Parts of A GHS-Compliant Label



1. **Product Identifier** - Should match the product identifier on the Safety Data Sheet.
2. **Signal Word** - Either use "Danger" (severe) or "Warning" (less severe)
3. **Hazard Statements** - A phrase assigned to a hazard class that describes the nature of the product's hazards
4. **Precautionary Statements** - Describes recommended measures to minimize or prevent adverse effects resulting from exposure.
5. **Supplier Identification** - The name, address and telephone number of the manufacturer or supplier.
6. **Pictograms** - Graphical symbols intended to convey specific hazard information visually.

Sample label courtesy of Weber Packaging Solutions • www.weberpackaging.com

GHS - Hazard Pictograms and Related Hazard Classes

Exploding Bomb
- Explosives
- Self-reactives
- Organic Peroxides

Corrosion
- Skin corrosion/burns
- Eye damage
- Corrosive to metals

Flame Over Circle
- Oxidizing gases
- Oxidizing liquids
- Oxidizing solids

Gas Cylinder
- Gases under pressure

Enviroment
- Aquatic toxicity

Skull & Crossbones
- Acute toxicity (fatal or toxic)

Exclamation Mark
- Irritant (eye & skin)
- Skin sensitizer
- Acute toxicity
- Narcotic effects
- Respiratory tract irritant
- Hazardous to ozone layer (non-mandatory)

Health Hazard
- Carcinogen
- Mutagenicity
- Reprodcutive toxicity
- Respiratory sensitizer
- Target organ toxicity
- Aspiration toxicity

Flame
- Flammables
- Pyrophorics
- Self-heating
- Emits flammable gas
- Self-reactives
- Organic peroxides

GHS SAFETY DATA SHEET

WELD-ON® 702™ Low VOC PVC Plastic Pipe Cement

Date Revised: **OCT 2013**
Supersedes: **DEC 2011**

SECTION I - PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: **WELD-ON® 702™ Low VOC PVC Plastic Pipe Cement**

PRODUCT USE: Low VOC Solvent Cement for PVC Plastic Pipe

SUPPLIER:

MANUFACTURER: IPS Corporation
17109 South Main Street, Gardena, CA 90248-3127
P.O. Box 379, Gardena, CA 90247-0379
Tel. 1-310-898-3300

EMERGENCY: Transportation: CHEMTEL Tel. 800.255-3924, +1 813-248-0585 (International) **Medical:** CHEMTEL Tel. 800.255-3924, +1 813-248-0585 (International)

SECTION 2 - HAZARDS IDENTIFICATION

GHS CLASSIFICATION:

Health		Environmental		Physical	
Acute Toxicity:	Category 4	Acute Toxicity:	None Known	Flammable Liquid	Category 2
Skin Irritation:	Category 3	Chronic Toxicity:	None Known		
Skin Sensitization:	NO				
Eye:	Category 2B				

GHS LABEL: **OR**

Signal Word: **Danger**

WHMIS CLASSIFICATION: CLASS B, DIVISION 2

Hazard Statements	Precautionary Statements
H225: Highly flammable liquid and vapor	P210: Keep away from heat/sparks/open flames/hot surfaces – No smoking
H319: Causes serious eye irritation	P261: Avoid breathing dust/fume/gas/mist/vapors/spray
H332: Harmful if inhaled	P280: Wear protective gloves/protective clothing/eye protection/face protection
H335: May cause respiratory irritation	P304+P340: IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing
H336: May cause drowsiness or dizziness	P403+P233: Store in a well ventilated place. Keep container tightly closed
EUH019: May form explosive peroxides	P501: Dispose of contents/container in accordance with local regulation

SECTION 3 - COMPOSITION/INFORMATION ON INGREDIENTS

	CAS#	EINECS #	REACH Pre-registration Number	CONCENTRATION % by Weight
Tetrahydrofuran (THF)	109-99-9	203-726-8	05-2116297729-22-0000	20 - 40
Methyl Ethyl Ketone (MEK)	78-93-3	201-159-0	05-2116297728-24-0000	30 - 45
Cyclohexanone	108-94-1	203-631-1	05-2116297718-25-0000	15 - 25

All of the constituents of this adhesive product are listed on the TSCA inventory of chemical substances maintained by the US EPA, or are exempt from that listing.
* Indicates this chemical is subject to the reporting requirements of Section 313 of the Emergency Planning and Community Right-to-Know Act of 1986 (40CFR372).
# indicates that this chemical is found on Proposition 65's List of chemicals known to the State of California to cause cancer or reproductive toxicity.

SECTION 4 - FIRST AID MEASURES

Contact with eyes: Flush eyes immediately with plenty of water for 15 minutes and seek medical advice immediately.
Skin contact: Remove contaminated clothing and shoes. Wash skin thoroughly with soap and water. If irritation develops, seek medical advice.
Inhalation: Remove to fresh air. If breathing is stopped, give artificial respiration. If breathing is difficult, give oxygen. Seek medical advice.
Ingestion: Rinse mouth with water. Give 1 or 2 glasses of water or milk to dilute. Do not induce vomiting. Seek medical advice immediately.

SECTION 5 - FIREFIGHTING MEASURES

Suitable Extinguishing Media: Dry chemical powder, carbon dioxide gas, foam, Halon, water fog.
Unsuitable Extinguishing Media: Water spray or stream.
Exposure Hazards: Inhalation and dermal contact
Combustion Products: Oxides of carbon, hydrogen chloride and smoke

	HMIS	NFPA	
Health	2	2	0-Minimal
Flammability	3	3	1-Slight
Reactivity	0	0	2-Moderate
PPE	B		3-Serious
			4-Severe

Protection for Firefighters: Self-contained breathing apparatus or full-face positive pressure airline masks.

SECTION 6 - ACCIDENTAL RELEASE MEASURES

Personal precautions: Keep away from heat, sparks and open flame.
Provide sufficient ventilation, use explosion-proof exhaust ventilation equipment or wear suitable respiratory protective equipment.
Prevent contact with skin or eyes (see section 8).
Environmental Precautions: Prevent product or liquids contaminated with product from entering sewers, drains, soil or open water course.
Methods for Cleaning up: Clean up with sand or other inert absorbent material. Transfer to a closable steel vessel.
Materials not to be used for clean up: Aluminum or plastic containers

SECTION 7 - HANDLING AND STORAGE

Handling: Avoid breathing of vapor, avoid contact with eyes, skin and clothing.
Keep away from ignition sources, use only electrically grounded handling equipment and ensure adequate ventilation/fume exhaust hoods.
Do not eat, drink or smoke while handling.
Storage: Store in ventilated room or shade below 44°C (110°F) and away from direct sunlight.
Keep away from ignition sources and incompatible materials: caustics, ammonia, inorganic acids, chlorinated compounds, strong oxidizers and isocyanates.
Follow all precautionary information on container label, product bulletins and solvent cementing literature.

SECTION 8 - PRECAUTIONS TO CONTROL EXPOSURE / PERSONAL PROTECTION

EXPOSURE LIMITS:

Component	ACGIH TLV	ACGIH STEL	OSHA PEL	OSHA STEL	OSHA PEL-Ceiling	CAL/OSHA PEL	CAL/OSHA Ceiling	CAL/OSHA STEL
Tetrahydrofuran (THF)	50 ppm	100 ppm	200 ppm	N/E	N/E	200 ppm	N/E	250 ppm
Methyl Ethyl Ketone (MEK)	200 ppm	300 ppm	200 ppm	N/E	N/E	200 ppm	N/E	300 ppm
Cyclohexanone	20 ppm	50 ppm	50 ppm	N/E	N/E	25 ppm	N/E	N/E

Engineering Controls: Use local exhaust as needed.
Monitoring: Maintain breathing zone airborne concentrations below exposure limits.
Personal Protective Equipment (PPE):
Eye Protection: Avoid contact with eyes, wear splash-proof chemical goggles, face shield, safety glasses (spectacles) with brow guards and side shields, etc. as may be appropriate for the exposure.
Skin Protection: Prevent contact with the skin as much as possible. Butyl rubber gloves should be used for frequent immersion.
Use of solvent-resistant gloves or solvent-resistant barrier cream should provide adequate protection when normal adhesive application practices and procedures are used for making structural bonds.
Respiratory Protection: Prevent inhalation of the solvents. Use in a well-ventilated room. Open doors and/or windows to ensure airflow and air changes. Use local exhaust ventilation to remove airborne contaminants from employee breathing zone and to keep contaminants below levels listed above.
With normal use, the Exposure Limit Value will not usually be reached. When limits approached, use respiratory protection equipment.

SECTION 9 - PHYSICAL AND CHEMICAL PROPERTIES

Appearance:	Clear, regular syrupy liquid		
Odor:	Ketone	**Odor Threshold:**	0.88 ppm (Cyclohexanone)
pH:	Not Applicable		
Melting/Freezing Point:	-108°C (-162°F) Based on first melting component: THF	**Boiling Range:**	66°C (151°F) to 156°C (313°F)
Boiling Point:	67°C (151°F) Based on first boiling component: THF	**Evaporation Rate:**	> 1.0 (BUAC = 1)
Flash Point:	-14°C (7°F) TCC based on THF	**Flammability:**	Category 2
Specific Gravity:	0.934 @23°C (73°F)	**Flammability Limits:**	**LEL:** 1.1% based on Cyclohexanone
Solubility:	Solvent portion soluble in water. Resin portion separates out.		**UEL:** 11.8% based on THF
Partition Coefficient n-octanol/water:	Not Available	**Vapor Pressure:**	129 mm Hg @ 20°C (68°F)based on THF
Auto-ignition Temperature:	321°C (609.8°F) based on THF	**Vapor Density:**	>2 (Air = 1)
Decomposition Temperature:	Not Applicable	**Other Data: Viscosity:**	Regular bodied
VOC Content:	When applied as directed, per SCAQMD Rule 1168, Test Method 316A,VOC content is: ≤ 510 g/l.		

SECTION 10 - STABILITY AND REACTIVITY

Stability: Stable
Hazardous decomposition products: None in normal use. When forced to burn, this product gives off oxides of carbon, hydrogen chloride and smoke.
Conditions to avoid: Keep away from heat, sparks, open flame and other ignition sources.
Incompatible Materials: Oxidizers, strong acids and bases, amines, ammonia

SECTION 11 - TOXICOLOGICAL INFORMATION

Likely Routes of Exposure: Inhalation, Eye and Skin Contact
Acute symptoms and effects:
Inhalation: Severe overexposure may result in nausea, dizziness, headache. Can cause drowsiness, irritation of eyes and nasal passages.
Eye Contact: Vapors slightly uncomfortable. Overexposure may result in severe eye injury with corneal or conjunctival inflammation on contact with the liquid.
Skin Contact: Liquid contact may remove natural skin oils resulting in skin irritation. Dermatitis may occur with prolonged contact.
Ingestion: May cause nausea, vomiting, diarrhea and mental sluggishness.
Chronic (long-term) effects: None known to humans

Toxicity:	LD_{50}	LC_{50}
Tetrahydrofuran (THF)	Oral: 2842 mg/kg (rat)	Inhalation 3 hrs. 21,000 mg/m^3 (rat)
Methyl Ethyl Ketone (MEK)	Oral: 2737 mg/kg (rat), Dermal: 6480 mg/kg (rabbit)	Inhalation 8 hrs. 23,500 mg/m^3 (rat)
Cyclohexanone	Oral: 1535 mg/kg (rat), Dermal: 948 mg/kg (rabbit)	Inhalation 4 hrs. 8,000 PPM (rat)

Reproductive Effects	Teratogenicity	Mutagenicity	Embryotoxicity	Sensitization to Product	Synergistic Products
Not Established	Not Established	Not Established	Not Established	Not Established	Not Established

SECTION 12 - ECOLOGICAL INFORMATION

Ecotoxicity: None Known
Mobility: In normal use, emission of volatile organic compounds (VOC's) to the air takes place, typically at a rate of ≤ 510 g/l.
Degradability: Biodegradable
Bioaccumulation: Minimal to none.

SECTION 13 - WASTE DISPOSAL CONSIDERATIONS

Follow local and national regulations. Consult disposal expert.

SECTION 14 - TRANSPORT INFORMATION

Proper Shipping Name: Adhesives
Hazard Class: 3
Secondary Risk: None
Identification Number: UN 1133
Packing Group: PG II
Label Required: Class 3 Flammable Liquid
Marine Pollutant: NO

EXCEPTION for Ground Shipping
DOT Limited Quantity: Up to 5L per inner packaging, 30 kg gross weight per package.
Consumer Commodity: Depending on packaging, these quantities may qualify under DOT as "ORM-D" .

TDG INFORMATION	
TDG CLASS:	FLAMMABLE LIQUID 3
SHIPPING NAME:	ADHESIVES
UN NUMBER/PACKING GROUP:	UN 1133, PG II

SECTION 15 - REGULATORY INFORMATION

Precautionary Label Information: Highly Flammable, Irritant
Symbols: F, Xi
Ingredient Listings: USA TSCA, Europe EINECS, Canada DSL, Australia AICS, Korea ECL/TCCL, Japan MITI (ENCS)

Risk Phrases:
R11: Highly flammable.
R20: Harmful by inhalation.
R36/37: Irritating to eyes and respiratory system.
R66: Repeated exposure may cause skin dryness or cracking
R67: Vapors may cause drowsiness and dizziness

Safety Phrases:
S9: Keep container in a well-ventilated place.
S16: Keep away from sources of ignition - No smoking.
S25: Avoid contact with eyes.
S26: In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
S33: Take precautionary measures against static discharges.
S46: If swallowed, seek medical advise immediately and show this container or label.

SECTION 16 - OTHER INFORMATION

Specification Information:
Department issuing data sheet: IPS, Safety Health & Environmental Affairs
E-mail address: <EHSinfo@ipscorp.com>
All ingredients are compliant with the requirements of the European Directive on RoHS (Restriction of Hazardous Substances).
Training necessary: Yes, training in practices and procedures contained in product literature.
Reissue date / reason for reissue: 10/16/2013 / Updated GHS Standard Format
Intended Use of Product: Solvent Cement for PVC Plastic Pipe

This product is intended for use by skilled individuals at their own risk. The information contained herein is based on data considered accurate based on current state of knowledge and experience. However, no warranty is expressed or implied regarding the accuracy of this data or the results to be obtained from the use thereof.

* *

I understand that working safely is a condition of employment at Brandenburg, and I have received a copy of Brandenburg's Safety Handbook.

I acknowledge the following subjects were communicated to me and I was given an opportunity to ask questions.

- Safety Orientation
- Fall Protection
- Lead Awareness
- Hazard Communication

I understand and will comply with all of the above items.

_____	_____	____ ____ ____
Name (Print Clearly)	Signature	Date
_____	_____	____ ____ ____
Trainer Name (Print Clearly)	Signature	Date

This is the certify that:

Name:_____

has been trained in respirator use, limitations and maintenance and that He/She was successfully qualitatively fit-tested for the following respirator under negative pressure:

Type O Half-Mask O Full-Face O FF PAPR

Brand:_____ Model_____

Size: O Small O Medium O Large

and that fit-testing was performed in accordance with OSHA 29 -CFR 1910.134, Respiratory Protection Standard including use of negative and positive pressure check, work simulations and the reciting of the Rainbow Passage or counting backwards from one hundred.

Could not be fit-tested: (reason)

_____

Instructor:_____ Date:_____

O I have been trained on, and understand the following:

- Limitations of respirators
- Inspection, cleaning and maintenance of respirator
- Proper use, donning and doffing of respirator
- Recognizing and handling of emergencies
- Purpose of medical evaluations

O I also understand that I have successfully undergone a qualitative fit-test and realize that I must be re-tested at least annually or upon physical changes, such as the gain or loss of twenty or more pounds, facial injuries, etc.

O I understand that I could not be fit-tested due to the reason stated above.

Signature:_____ Date:_____

Physician's Written Opinion - Asbestos

Brandenburg®

Employee Name: _____

As required by 29 CFR 1926.1101, a medical examination was performed on the above individual on _____.

1.) Are there any detected medical conditions that would place the employee at an increased risk of material health impairment from exposure to asbestos?

[ ] Yes [ ] No

If yes, please describe: _____

_____

_____

2.) Are there any recommended limitations regarding this individual's use of personal protective equipment (i.e. Respirator)?

[ ] Yes [ ] No

If yes, please describe: _____

_____

_____

This employee has been informed of:

a) The results of this medical examination;

b) Any medical conditions detected which require further evaluation or treatment,

c) And the increased risk of lung cancer attributable to the combined effect of smoking and asbestos exposure.

Medical provider signature:_____

Date:_____

PLHCP Written Statement for Respirators

Brandenburg®

(Clinic Name)
(Address)
(Phone / Fax)

Service Date: _____

Employee Name: _____ Employee SSN: _____

Address:_____

Employer: _____

You were evaluated in this office of your medical status related to your physical capability to wear a respirator. (Check √ one that applies)

☐ There were no abnormal findings that would hamper your ability to perform your job duties while wearing a respirator.

☐ The abnormal findings listed below were not related to wearing a respirator but should be reported to your personal physician for further evaluation.

_____

_____

Based upon the results of this evaluation, it is my opinion that you: (Check √ ALL that apply)

☐ Are qualified to wear a respirator.

☐ Have the following restrictions concerning respirator usage:_____

☐ ARE NOT qualified to wear a respirator.

☐ Require further testing by your private physician who must submit a written report of his/her findings to _____ so that a final decision on your ability to wear a respirator can be made.

☐ Must wear Special prescription eye-wear needed to accommodate respirator.

☐ Must use an Eye glass conversion kit.

☐ May need to shave Facial hair to assure tight seal on certain face masks.

☐ Need to stop smoking.

(Check √ ALL that apply)

☐ The above individual HAS been examined for respirator fitness in accordance with 29 CFR 1910.134. This limited evaluation is specific to respirator use only. Employees should be instructed to report any difficulties in using respirators or changes of any physical status to their supervisor or physician. The evaluation included the Respiratory Questionnaire outlined in 29 CFR 1910.134.

☐ The above individual HAS NOT been examined by me for respirator fitness. The employee's medical evaluation consisted of a review of OSHA's Medical Evaluation Questionnaire in Appendix C Part A Section 2. In accordance with 29 CFR 1910.134, this limited evaluation is specific to respirator use only. Employees should be instructed to report any difficulties in using respirators or changes of any physical status to their supervisor or physician. The evaluation included the Respiratory Questionnaire outlined in 29 CFR 1910.134.

☐ In accordance with specific OSHA requirements, I have informed the above named individual of the results of this evaluation and of any medical conditions resulting from exposures that may require further explanation or treatment. Where applicable, the above named individual has been informed of the increased risk of lung cancer attributable to the combined effect of smoking and asbestos, lead and/or other chemical exposure(s).

Respirators must be properly selected based on the containment and concentration levels to which the worker will be exposed. Failure to follow the use and fitting instruction and warnings for proper use contained on the respirator packaging and/or failure to wear the respirator during all times of exposure can reduce the respirator's effectiveness and result in sickness or death. Wearer must be trained in the proper care of any respirator. Refer to product literature and packaging for specific information regarding fit, use and/or limitations.

_____ _____

PLHCP Signature Employee Signature

_____ _____

PLHCP Name (printed) Expiration Date

[1]Physican or other Licensed Healthcare Professional

To be maintained in the employee's file with a copy to the employee

SAF-16B

Physician's Written Opinion - Cadmium

Brandenburg®

Employee Name: _____

As required by 29 CFR 1926.1127, a medical examination was performed on the above individual on _____.

The above individual's blood cadmium level is_____.

The above individual's urine cadmium level is _____.

The above individual's Beta-2 microglobulin in urine level is _____.

Based on the results of this examination, the following limitations upon the employee's assigned work with cadmium and / or the use of respirators:

None: _____

1.) _____

2.) _____

3.) _____

4.) _____

Except as listed above, there are no detectable medical conditions which would place the employee at increased risk of material impairment of health due to work with cadmium.

This employee has been informed of:

a) The results of this medical examination, including all biological monitoring results;

b) Any medical conditions detected which require further evaluation or treatment,

c) And any limitation on the employee's diet or use of medication (if applicable)

either at the time of the examination or by phone call subsequent to the examination.

Medical provider signature: _____

Date: _____

Physician's Written Opinion – Inorganic Arsenic Brandenburg®

Employee Name: _____

As required by 29 CFR 1910.1018, a medical examination was performed on the above individual on _____.

The above individual's urine arsenic level is _____.

1.) Are there any detected medical conditions that would place the employee at an increased risk of material health impairment from exposure to inorganic arsenic?

[ ] Yes [ ] No

If yes, please describe: _____

_____

_____

2.) Are there any recommended limitations regarding this individual's exposure to inorganic arsenic or the use of personal protective equipment (ie. Respirator)?

[ ] Yes [ ] No

If yes, please describe: _____

_____

_____

This employee has been informed of:

a) The results of this medical examination, and

b) Any medical conditions detected which require further explanation or treatment

Medical provider signature: _____

Date: _____

Physician's Written Opinion - Lead

Brandenburg®

Employee Name: _____

As required by 29 CFR 1926.62, a medical examination was performed on the above individual on _____.

The above individual's blood lead level is _____.

The above individual's ZPP level is _____.

Based on the results of this examination, the following limitations upon the employee's assigned work with lead and / or the use of respirators:

None: _____

1.) _____

2.) _____

3.) _____

4.) _____

Except as listed above, there are no detectable medical conditions which would place the employee at increased risk of material impairment of health due to work with lead.

This employee has been informed of any medical conditions which require further examination or treatment either at the time of the examination or by phone call subsequent to the examination.

Medical provider signature: _____

Date: _____

Employee Name: _____

As required by 29 CFR 1926.120, a medical examination was performed on the above individual on _____.

Based on the results of this examination, the following limitations upon the employee's assigned work with hazardous waste:

None:_____

1.)_____

2.)_____

3.)_____

4.)_____

Except as listed above, there are no detectable medical conditions which would place the employee at increased risk of material impairment of health due to work with hazardous waste.

This employee has been informed of any medical conditions which require further examination or treatment either at the time of the examination or by phone call subsequent to the examination.

Medical provider signature: _____

Date: _____

Structural Pre-Setup Safety Inspection

Brandenburg®

Supervisor / Inspector: _____ **Date:** _____ **Time:** _____ **Project Cd:** _____

Area to be inspected _____

Demo Activity Leading to Inspection: _____

Items of Inspection	CONDITION	ACTION
Building Entry Walkways:		
Setup Area Access Routes:		
Stairways:		
Floor Grating:		
Floor Openings:		
Handrails / Guard Rails:		
Demarcation of Area:		
Unprotected Leading Edges:		
Manlift Accessibility:		
Machine Accessibility:		
Lighting:		
Hanging Debris:		
Overhead / Loose Hazards:		

Notes / Observations:

_____

_____

_____

_____

Supervisor / Inspector: _____

Employee Acknowledgement:

_____ _____ _____

_____ _____ _____

_____ _____ _____

_____ _____ _____

Project	Job Code	Shift - Work Period	Permit Start		Permit Termination	
			Start Date	Start Time	End Date	End Time

A) Describe the confined space:

a) the location of the confined space relative to job site
b) equipment in the space
c) tasks to be performed in the space and on the equipment

B) Describe the prevailing work conditions. (Rain, wind, lighting, ice, escape route OK? visibility OK?, footing OK?)

C) Protective equipment utilized.		**E) These precautions have been taken, when they apply.**	
Safety Harness & Life Line		1) Equipment / machinery has been de-energized or locked out.	
Tripod		2) Electric lines have been de-energized, blocked or broken.	
Proper respiratory protection		3) 12V lighting in place.	
Air mover		4) Additional venting in place.	
Protective clothing		5)	
Other 1		6)	
Other 2		7)	

D) Communication mode		**E) Rescue Personnel**			
Visual		On-Site		Contact #	
Voice		Off-Site		Contact #	
Radio					
Other 1					
Other 2					

H) Required Atmospheric Tests and Monitoring Results

List Tested Substances	Identify Safe Reading	Result	Result	Result	Result	Result	Result
		Time tested	Time tested	Time tested	Time tested	Time tested	Time tested
Oxygen	19.5% - 23.5%						
Explosive	< 10% LEL						

I) Confined space authorized entrant list.

#	EMPCD	Signature	#	EMPCD	Signature
1			5		
2			6		
3			7		
4			8		

J) Sign Offs

Entered information on permit /verified prevailing conditions of confined space
Listed and verified Authorized Entrants
Verified safe exit of all entrants at work period termination
Will monitor entrants for duration of work period.

					Signature	EMPCD	Pre-Job Permit Signoff	Job Completion Signoff
				Qualified Attendant				
				Entry Supervisor				

CONFINED SPACE WORK RULES

1) **A Confined Space Permit must be posted at the confined space entrance before any employee may enter the space.**
2) A Confined Space Permit is valid for one shift only.
3) If the Entry Supervisor or the Qualified Attendant changes during a work period, the current permit must be closed and a new permit created.
4) Upon completion of the work or the shift, the Confined Space Permit will be returned to the Field Supervisor.
5) The Entry Supervisor will ensure that confined space requirements are adhered to.
6) All confined spaces will be identified on the Site Safety Plan and will be clearly labeled on the job site.
7) If a confined space has more than one access, one and only one will be used as an entrance and this entrance will be clearly labeled.

High Voltage Permit

Brandenburg®

Project	Job Code	Reporting EMPCD	Signature	Date/Time

A) Work Area Description

B) Personnel Performing Duties

#	EMPCD	Signature	#	EMPCD	Signature
1			7		
2			8		
3			9		
4			10		
5			11		
6			12		

C) Safety Equipment Required for Job

Fire retardant clothing	
Hot gloves	
Appropriate shielding	
Electric mats	
Hot stick	
Non-conductive snake	
Volt/amp meter	
Barriers	
Barricade tape	
Other	
Other	
Other	
Other	
Other	
Other	
Other	

D) Precautions required

G) Signoffs

All persons involved in the performance of the job have been advised of their duties and responsibilities

↓	Title	EMPCD	Signature	Date/Time
	Field Supervisor			
	Safety Manager			

Trenching Excavation Permit

Brandenburg®

Project	Job Code	Shift - Work Period	Permit Start		Permit Termination	
			Start Date	Start Time	End Date	End Time

A) Describe location of trench or excavation relative to job site.

B) Trench / Excavation - Dimentions and Conditions

Dimensions		Depth		Width		Length	
Soil Conditions	SOIL TESTING						

Soil Classification		Other Tests Performed	Other Test Results	Tested by Laboritory			
Type A		1)		yes		no	
Type B		2)		Laboratory name			
Type C							

C) Atmospheric Testing Results

List Tested Substances	Identify Safe Reading	Result / Date tested		List Tested Substances	Identify Safe Reading	Result / Date tested
Oxygen	19.5% - 23.5%		Other			
LEL %	< 10%		Other			

D) Describe the prevailing ground conditions, particularly note conditions after rain, sleet, snow, high winds, etc.

E) Entrance and egress facilities

	Qty	Location(s)
Stairway(s)		
Ladder(s)		
Ramp(s)		

F) Protective Systems Utilized

Sloping		Trench box	
Shoring		Stop blocks	
Benching		Cordoning of area	
Other			

G) Protective Equipment Utilized

Safety Harness & Life Line	
SCBA	
Tripod	
Proper Respiratory Protection	
Air Mover	
Protective Clothing	
Other 1	
Other 2	

H) Preventative Measures Implemented

	Has been addressed	N / A
1) Vehicular and machinery operation patterns		
2) Operation and location of water removal equipment		
3) Influence of surrounding areas, buildings, foundations, etc		
4) Relevant utilities blocked or adequately shielded/protected		
5)		
6)		

I) Entrant list

#	EMPCD	Signature	#	EMPCD	Signature
1			5		
2			6		
3			7		
4			8		

J) Signoffs

Entered Permit information / Verified Prevailing Conditions

Tested Soil

Listed Entrants

					Signature	EMPCD	Date / Time
			Competent Person				
			Field Supervisor				
			EHS Manager				

EXCAVATION-TRENCHING WORK RULES

1) An Excavation-Trenching Permit is valid for one shift only.
2) This permit must be readily available on-site.
3) The Compentent Person is responsible for maintaining the requirements of Brandenburg's Excavation-Trenching work rules.
4) Upon completion of the shift, the Excavation-Trenching Permit will be returned to the Field Supervisor.
5) The Field Supervisor will file the Excavation-Trenching Permit in the Project file.

Scaffold Inspection Report

Brandenburg®

Inspector	EMPCD	Date / Time of Inspection	Field Supervisor	EMPCD

Project Code			N/A	YES	NO
Does the scaffold appear to be erected properly?					
Is a ladder or safe access provided?					
Do the legs appear to be set on adequate bases to support the load?					
Are metal tubular frame scaffolds designed, constructed and erected to support four (4) times the load?					
Does bracing appear to be adequate?					
Are poles spaced adequately?					
Are poles plumb?					
Are welded tubular frame scaffolds that exceed 26 feet in height secured to the building at intervals not exceeding 30 feet horizontally and 26 feet vertically?					
For scaffolds in excess of 10 feet in height, are guardrails and toe boards installed on all open sides and ends of scaffold platforms?					
Are scaffolds where persons are required to work or pass under provided with a screen between the toeboard and the guardrail extending along the entire opening, consisting of No. 18 gauge wire 1/2 inch mesh, or the equivalent?					
Are all planks “Scaffold Grade” or equivalent?					
Are all platform planks overlapped or secured from movement?					
Do scaffold planks extend over their end supports not less than 6 inches but not more than 12 inches?					
For scaffolds near power lines - Is there a minimum of 10 feet of clearance between the scaffold or a conductive object that a worker may be using? NOTE: For voltages in excess of 480 contact the Environmental Health & Safety Manger.					

If the above conditions are not met, do not allow anyone to access the scaffold and contact the Field Supervisor.

Completed forms to be forwarded to the Field Supervisor and placed in the Project File.

Rigging Inspection Report

Brandenburg®

Project Name	Job Code	EMPCD	Signature	Date	Time

nstructions:
1. Place an "X" if defects are observed, then tag the component "Do Not Use".
2. Place and "OK" if no defects are found.
3. Place completed form in the project file.

Equipment Description	Equipment Number	Broken wires	Reduction in diameter	Kinking, crushing	Bird caging	Heat / mechanical damage	Chemical damage	Hook spread/twist	Broken / worn stitches	Worn / malformed links	

Line Break Permit

Brandenburg®

Project Name	Job Code	Date of Report	On-site location where work will take place

A) Description of work activity

B) Special instructions

C) PPE		D) Other Protective Measures	
Tyvek coveralls		Sewers covered, closed or plugged	
Acid suit		Valves/pumps/equip. locked-out/blanked	
Acid hood		Blower	
Boot covers		Water hose	
Vented goggles		Standby Person	
Face shield		Fire alarm location confirmed	
Hot suit		First aid kit/stretcher location confirmed	
Leather gloves		Shower/eye wash location confirmed	
Gauntlet gloves		Escape route planned	
Rubber boots		Grating, floor openings covered	
Rain suit		Piping support installed as needed	
Special shielding		Spark proof tools	
Air pack		Barricade	
Full face APR		Temperature checked OK	
Half face APR		Line de-pressurized, vented, bled down	
Non vented goggles		Area checked for potential influences	
Apron		Emergency responders alerted	
Other		Other	
Other		Other	
Other		Other	

E) Description of special PPE or special protective measures

Titles	Signature	EMPCD	Date
Person filling out form			
Person making line break			
Approvals			
Field Supervisor			
EHS Manager			

Hot Work Permit

Brandenburg®

Project Name	Job Code	Date of Report	On-site location where work will take place

A) Description of Job

B) Workers Assigned

#	EMPCD	Signature	#	EMPCD	Signature
1			7		
2			8		
3			9		
4			10		
5			11		
6			12		

Coveralls		Combustible materials removed	
Leggings		Water hose/fire extinguisher available	
Shroud		Fire alarm location	
Boot covers		Planned escape route	
Rubber boots		First aid kit/stretcher location	
Face shield		Signs, barricades posted	
Hot suit		Surrounding areas checked	
Leather gloves		Appropriate items tarped/covered	
Gauntlet gloves		Areas pre soaked with water	
Respiratory Protection		Emergency responders alerted	
Other		Other	
Other		Other	

E) Area Monitoring Results % LEL

Result 1	Result 2	Result 3	Result 4	Result 5	Result 6	Result 7
Time tested	Time tested	Time tested	Time tested	Time tested	Time tested	Time tested

F) Description of special protective measures

G) Approvals

Title	EMPCD	Signature	Date / Time
Field Supervisor			
EHS Manager			

Critical Lift Permit

Brandenburg®

Project Name	Job Code	Reporting Employee	EMPCD	Report Date

Scheduled Lift Date		Scheduled Lift Time	

A) CRANE USED FOR LIFT

Manufacturer	Serial #	Length of Main Boom	Length of Jib	Stated Capacity	Recommended Weight Reduction

B) LOAD INFORMATION

Describe Load to be Lifted

Total Weight of Load	Who (EMPCD) determined	What was used to determine weight (bill-of-lading, scale, etc.)?	Percentage of crane's lift capacity	****** NOTE **** LIFT WILL NOT BE MADE For a load/capacity exceeding 74%**

C) LIFT COMPONENT INFORMATION

Identify and describe equipment/components to be used in lift. (Example component: shackles, chokers, etc….)

	Lift Component 1	Lift Component 2	Lift Component 2	Lift Component 4	Lift Component 5	****** NOTE **** LIFT WILL NOT BE MADE**
Component						**If any component combined safety factor**
Rating						
Condition Has Been Inspected						
Number Utilized						
Component Combined Safety Factor						**is less than 5 to 1**

Describe the components to be used in the load handling line.

Will a tag line be used? (yes / no)

D) LIFT CYCLE INFORMATION

Radius	Elevation		Boom Angle		Boom Swing	
Maximum Achieved	Minimum Achieved	Maximum Achieved	Beginning of Lift	End of Lift	Direction (left/right)	Degree of Swing

E) SITE CONDITIONS

Describe specific location of lift relative to the job site.

Describe soil type and soil moisture content in the lift area.

Describe weather forecast for scheduled lift time (Note possibility of rain, wind or temperature extremes).

Critical Lift Permit

Brandenburg®

Project Name	Job Code	Reporting Employee	EMPCD	Report Date	Report Date

E) HAZARDOUS CONDITIONS

Identify potential problems within vicinity of lift area (pick/swing/set).

	Potential Problem			Potential Problem		Other potential problems	
N/A	↓		N/A	↓		↓	
		a) electric lines			e) drainage lines	l)	
		b) gas lines			f) adjacent excavations	j)	
		c) processing lines			g) adjacent structures	k)	
		d) sewage lines			h) adjacent storage tanks	l)	

Describe hazard (distance from lift area, location on site, number of feet above or below ground level, content, voltage, flow rate, pipe diameter, volume, etc.) and protective measures taken.

1)

2)

3)

PRE-LIFT MEETING

Meeting Location		Meeting Date		Meeting Time	

Meeting Participants

Title	Signature	EMPCD	Date	P.E. STAMP (if required)
Rigger				
Operator				
Field Supervisor				
EHS Manager				

Other Attendees. Identify entity represented, title, name, contact phone number.

1.	
2.	
3.	

Asbestos Waiver of Liability Regulated Area

Brandenburg®

I have requested admission to the Regulated Area described below. I have been informed, and I am fully aware, that the Regulated Area may contain highly dangerous and/or substances in addition to asbestos contamination. I assume full responsibility for my exposure to such conditions and for any damage, harm or loss I incur. In connection with my request, my admission to and my activities in the Regulated Area, I hereby represent, warrant, covenant, acknowledge, agree and confirm to and with Brandenburg Industrial Service Company as follows:

1. I am required and have been directed to enter the Regulated Area in the normal course of work duties and employment, for the sole purpose stated below.
2. I am authorized to execute this Agreement on behalf of my company, agency or other employer noted above.
3. I am knowledgeable about, competent in, have the appropriate licensing and/or certifications to perform the tasks described below, and have received all necessary training and education in: (a) the proper handling and disposal of all types of asbestos containing materials, (b) the use of all types of protective equipment which is or may be necessary to protect me from exposure to asbestos, and (c) any and all other personal health, safely and hygiene requirements imposed by any and all applicable federal, state and local laws, statutes, ordinances, rules and regulations relating to Asbestos. A medical doctor has examined me and determined that I am fit and capable of using any respirator which I may be required to wear.
4. I have entered into this Agreement, and I will enter and conduct myself in the Regulated Area with the full knowledge and understanding that no party has either stated or implied, verbally or in writing, that the amount or concentration of asbestos within the Regulated Area will be limited in any way. Being fully knowledgeable about asbestos protective equipment and personal health, safety and hygiene requirements and procedures, I have selected and will use the proper protective equipment and I will follow and observe all required and applicable health, safety and hygiene requirements and procedures and such others as I have been advised to follow or observe. I will continuously and properly use, wear and maintain all necessary requirements and follow all procedures at all times that I am in or about the vicinity of the Regulated Area, and I assume full responsibility for any failure on my part to do so.
5. I and all of my heirs, executors, administrators, successors, assigns, legal representatives and all others claiming by or through me (all parties described in the preceding portion of this sentence being hereinafter collectively referred to as my "Successors"), and my company, agency or other employer noted below and its successors or assigns, hereby release and discharge Brandenburg Industrial Service Company, any owner, occupant or manager of the property at which the Regulated Area is located, their respective partners, officers, directors, shareholders, employees, agents, architects, engineers, or anyone else acting for or on behalf of any of them, together with their respective heirs, executors, administrators, legal representatives, successors and assigns (herein collectively called the "Indemnities") from and against any and all damage, harm, loss, costs, or liability (including without limitation personal injury, illness, disability or death, and loss of or damage to personal property) which I or my company, agency or other employer noted above incur or sustain or might incur or sustain at any time. I am in, or about the vicinity of, the Regulated Area, or as a result of my entrance into, or activities in, the Regulated Area and/or the vicinity thereof. I and my successors, and my company, agency or other employer noted above, further hereby relinquish forever any and all right to make any claim whatsoever against the Indemnities or any of them because of any such damage, harm, loss, costs, or liability I or we may at any time incur or suffer.

COMPANY OR AGENCY REPRESENTED _____

ADDRESS OF REGULATED AREA _____

PURPOSE FOR ENTERING REGULATED AREA _____

PRINT FULL NAME _____ Last four digits of SS # _____

SIGNATURE _____Date: _____ Time In: _____ Time Out: _____

You must fill this form out completely

SAF-32

Suspended Work Platform Form

Brandenburg®

Project Name_____ Project Number_____

Project Superintendent/Competent Person_____

It has been determined by _____, the competent person, that all other conventional means of access, (ladders, scaffolds, etc.), are unsafe or not feasible for this work operation.

CRANE REQUIREMENTS:

1. Crane is placed on a firm foundation/ground	Yes	No
2. Crane is uniformly level within 1 percent of level grade.	Yes	No
3. Crane has a minimum safety factor of 7 for the load line	Yes	No
4 .Crane has rotation resistant rope with a safety factor of 10	Yes	No
5. Crane is equipped with a boom angle indicator visible to the crane operator	Yes	No
6. Crane w/telescoping boom is equipped with a device to clearly indicate the boom's extended length or load radius is determined prior to hoisting personnel	Yes	No
7. Crane is equipped with an anti two blocking device	Yes	No

PERSONNEL PLATFORMS - MANBASKETS:

Load Restrictions:

1. Work platform load will not exceed its rated load capacity	Yes	No
2. Workers have been trained in safe work practices for Man Baskets	Yes	No
3. All materials and tools are secure and evenly distributed while in motion	Yes	No

RIGGING – Rigging for personnel work platforms shall conform to the following requirements

1. Legs of bridles are connected to a master link	Yes	No
2. Bridles and associated rigging are not used for any other purpose	Yes	No
3. Hooks and any other attachments assemblies must be closed at the throat NOTE: mousing is prohibited.	Yes	No

INSPECTIONS AND TESTS

1. Has the platform been loaded to its anticipated lift weight? Yes No

2. Has the crane operator lifted the man basket to each working location? Yes No

3. Are all crane systems, controls and safety devices functioning properly? Yes No

4. Boom / hoisting configurations do not exceed 50% load limit of rated capacity? Yes No

5. If crane location changes, repeat the trial lift. Yes No

6. Has the competent person conducted a visual inspection of the crane, personnel platform, and the crane base support or ground for any defects or hazardous conditions? Yes No

7. Has the man basket been proof tested to 125% of the rated capacity? (proof testing protocol can be found in the OSHA 3100 Booklet, included). Yes No

8. Has the pre-lift safety meeting been held with all involved workers and the person responsible for the overall hoisting operation? Yes No

9. Have "Safe Work Practices" (SWP) been reviewed with all involved workers? (SWP for laborers can be found in the OSHA 3100 Booklet, included) Yes No

10. Have Safe Work Practices and emergency procedures been reviewed with the crane operator? (SWP for operators located in the OSHA 3100 Booklet, included) Yes No

Personnel hoisting is prohibited while a crane is traveling, except when the Division Manager or his designee determines that it is the least hazardous way to accomplish the assigned task.

Pre-Lift Safety Meeting Sign Off:

Print **Signature**

_____

_____

_____

_____

_____

_____

_____

_____

_____

Project Superintendent and / or Competent Person_____**Date/Time**_____

Task Safety Analysis (TSA)

Brandenburg®

Company: _____ **Location:** _____ **Date & Time Completed:** _____

Task: _____

Task Steps: *(List the task steps required to perform the work activity in the sequence they are to be carried out.)*	**Hazards:** *(List the hazards that could cause injury when the task is performed.)*	**Safe Work Plan:** *(List the control measures required to eliminate or minimize the risk of injury arising from the identified hazard.)*	**Resources:** *(PPE, permits, procedures, training, tools, equipment, materials, people, etc.)*

Task has been reviewed with all personnel performing task prior to commencement of work

Supervisor and/or Environmental Health & Safety Manager Signature: _____

Employee Signatures: _____ _____ _____

_____ _____ _____ _____

_____ _____ _____ _____

_____ _____ _____ _____

_____ _____ _____ _____

Review checklist while completing front page of TSA - Please check all that apply		
Req. Permits	**Hazards**	**Hazard Control Measures**
☐ Asbestos	☐ Working on roof	☐ 2 way radio ☐ Buddy System ☐ Fall protection ☐ Warning line system ☐ Safety Monitor
☐ Excavation/Trenching ☐ Lifting and Rigging	☐ Overhead Utilities	☐ Power deenergized ☐ Protective coverings ☐ Spotter required ☐ Required clearance distance = _____Ft. ☐ Safe work zone marked
☐ Confined Space ☐ Fire System Shutdown	☐ Crane or other Lifting Equipment	☐ Signalman assigned ☐ Tag lines in use ☐ Swing radius barricaded ☐ Qualified Operator ☐ WLL not exceeded ☐ Lifting equipment inspected ☐ Personnel protected from overhead load ☐ Current Inspection ☐ Competent Person ☐ Stable surface ☐ Approved Lift Plan
☐ Hot Work ☐ Coring/Cutting	☐ Underground Utilities	☐ Reviewed as-builts ☐ Subsurface surveys ☐ Scanning / Ground Penetrating Radar (GPR) ☐ Required clearance distance = _____ Ft. ☐ Safe work zone Marked ☐ Third party notifications
☐ Line Breaking ☐ Energy Isolation/LOTO	☐ Electrical	☐ Lock Out/Tag Out ☐ Check equipment ☐ Verify equipment is de-energized ☐ NFPA 70E electrical safety procedures ☐ Qualified Person ☐ Color coding system ☐ Physical disconnects
Required PPE	☐ Excavations	☐ Inspected prior to entering ☐ Proper sloping/shoring/benching ☐ Barricades provided ☐ Access/egress provided ☐ Protection from accumulated water ☐ No entry
☐ Hard Hat ☐ Ear Plugs/Ear Muffs	☐ Fire Hazard	☐ Fire Extinguishers ☐ Fire watch ☐ Adjacent area protected ☐ Checked LEL, Oxygen ☐ Flammable/combustible material removed/protected ☐ Proper cylinder storage ☐ Torch flash arrestors ☐ Water lines
Eye Protection:	☐ Struck-by Vehicular Traffic or Heavy Equipment	☐ Traffic Barricades/Cones/Signs ☐ Flagmen/Spotters/Ground Person ☐ Lane closure ☐ Communication with equipment operator ☐ Safe Distances maintained ☐ Pre-use Inspections ☐ Qualified Operators ☐ Safety devices functioning properly (lights, alarms, horns)
☐ Safety Glasses	☐ Noise >85 dB	☐ Hearing protection is required (hammering, torch use, power tools, skid steer use): ☐ Ear plugs ☐ Ear Muffs ☐ Both
☐ Face Shield ☐ Chemical Goggles	☐ Hand & Power Tools:	☐ Inspect general condition ☐ GFCI in use ☐ Identified PPE required for each tool ☐ Reviewed safety requirements in operators manual(s) ☐ Guarding OK ☐ Used for their intended use
☐ Welding Hood	☐ Hand Hazards	☐ PPE gloves, etc. ☐ Protected sharp edges as necessary
Hand Protection:	☐ Manual Lifting	☐ Reviewed proper lifting tech. ☐ Identified material requiring lifting equipment ☐ Buddy System ☐ Reduce Weight ☐ Stretch & Bend (work conditioning)
☐ Cut Resistant Gloves ☐ Welders Gloves	☐ Working At Heights	☐ Anchorage Point Available ☐ Fall Clearance Distance Adequate ☐ Personal fall protection ☐ Fall Rescue/Retrieval Plan Set Up ☐ Guard Rail System and/or Covers
☐ Chemical Protective Gloves ☐ Leather Gloves	☐ Ladders	☐ Inspect before use ☐ Ladder properly setup ☐ Ladder tied off ☐ Straight ladder extended 36" above landing ☐ Only used for their intended purpose ☐ Rated load capacity not exceeded ☐ A-frame ladder top two steps not used
☐ Rubber Gloves ☐ Electrical Insulated Gloves	☐ Scaffolds	☐ Inspect general condition before use ☐ Properly secured ☐ Full Decked ☐ Toe boards used ☐ Footings adequate ☐ Materials properly stored on scaffold ☐ Guardrails ☐ Fall Protection
☐ Arm Sleeves **Foot Protection:**	☐ Slips, Trips, Falls	☐ Inspect for trip hazards ☐ Hazards marked ☐ Tools & material properly stored ☐ Extension cords properly secured ☐ Work zone free of debris ☐ No jumping off equipment ☐ Maintain 3-points of contact while exiting/entering machinery
	☐ Pinch Points	☐ Clear communication with equipment operators ☐ Material layout (e.g.- scrap positioning) ☐ Hand/Body positioning
☐ Metatarsal Steel-toe boots, Safety Toe Boots or Shoes	☐ Working w/ Chemicals	☐ List specific chemicals involved and list hazards and precaution on front side ☐ Reviewed SDS ☐ Have proper containers and labels. ☐ Identified proper PPE (clothing, gloves, etc.)
☐ Rubber Boots ☐ Disposable shoe/boot covers	☐ Asbestos	☐ Wet Removal ☐ Prompt housekeeping ☐ Hygiene facilities ☐ Coveralls/Gloves ☐ Negative Pressure Enclosures ☐ Properly trained ☐ Signs posted ☐ Exposure monitoring/historical data ☐ Respiratory Protection ☐ Medical Surveillance ☐ ACM Licensed employees ☐ HEPA vacuums ☐ Intact removal ☐ Follow Asbestos Standard 1926.1101
Respiratory Protection:	☐ Heat Stress Potential	☐ Liquids available ☐ Cool down periods ☐ Sun Screen ☐ Work-Rest schedules ☐ Reviewed Heat Stress symptoms ☐ Identify Shaded Areas ☐ Employees monitored by Supervisor and co-workers
☐ Air Purifying Respirator	☐ Cold Stress Potential	☐ Proper clothing (i.e.. gloves, coat, coveralls) ☐ Warming shelter nearby ☐ Reviewed Cold Stress symptoms ☐ Warm up periods ☐ Employees monitored by Supervisor and co-workers
☐ Powered Air Purifying Respirator ☐ Supplied Air Respirator Powered	☐ Lead & Metal Fumes	☐ Wet Removal ☐ Medical Surveillance ☐ 3' Torch ☐ Stand upwind ☐ Forced/Exhaust Ventilation ☐ Properly trained ☐ Mechanical demo ☐ Exposure monitoring/historical data ☐ Increase natural ventilation ☐ Hygiene facilities (e.g.- hand washing & showers) ☐ Abate cut lines ☐ HEPA equipped power tools ☐ Follow Lead Standard 1926.62
☐ Emergency Escape Respirator ☐ SCBA	☐ Animals, Reptiles, Insects	☐ Avoid dark area ☐ Repellant ☐ Hazard awareness training ☐ Avoid stepping or touching hidden areas where reptiles/animals/insects are likely to be resting or hiding
Other PPE/Detectors ☐ Fire Retardant Clothing (FRC)	☐ Adjacent Work/Processes Causing Hazards to Others	☐ Notified them of our presence ☐ Ground person ☐ Coordinated with adjacent supervisor/customer/operator ☐ Area demarcated, signs, barricades ☐ Brandenburg escort provided to others
☐ Disposable Coveralls (e.g.- Tyvek ®)	☐ Dust & Silica Exposures	☐ Wet Removal ☐ Prompt housekeeping ☐ Respiratory Protection ☐ Forced/Exhaust Ventilation ☐ Exposure monitoring/historical data ☐ Increase natural ventilation
☐ Chemical Protective Coveralls	☐ Struck-by Falling Debris	☐ Ground watch required ☐ Area demarcated with "Danger Falling Material" signs ☐ Intermediate floors barricaded ☐ Radio communication
☐ High Visibility Vest/Shirt	☐ Drowning	☐ Life preservers ☐ Rescue skiff ☐ Ring buoy ☐ Fall protection ☐ Guardrails
☐ Rain Suit	☐ Struck-by Debris/Scrap while Loading Trailers	☐ Drivers will be out-of-cab ☐ Drivers wearing minimum required PPE ☐ Drivers at safe distances ☐ Spotter required ☐ Designated loading zone ☐ Avoid blind zone of trailers
☐ Personal Gas Detector (CO)	☐ Falls from Aerial Lifts	☐ Full-body harness & lanyard ☐ Both feet on platform ☐ No standing on hand rails/guardrails ☐ Lift positioned on stable ground
☐ Personal Gas Detector (H2S)	☐ Aerial Lift Pinch Points	☐ All body parts will remain inside manlift while raising, lowering, and positioning
Fall Protection:	☐ Overexertion while Handling Oxy/Fuel Cylinders	☐ Use lifting equipment (forklifts, skid steers) ☐ Transport all empty / full cylinders using Brandenburg bottle carts to / from work areas and cylinder storage areas
☐ Full-body Harness	☐ Struck-by Flying Material	☐ Ground personnel maintain safe distances ☐ Area demarcation ☐ Safe zones established ☐ Verify "all clear" prior to dropping
☐ Double Lanyard	☐ PCB Exposure	☐ Trained in proper handling & hazards ☐ Disposable coveralls, gloves, booties ☐ Spill kit ☐ Closed system draining ☐ Respirator equipped with OV/P100 filters
☐ Additional Anchorage Connector Needed (e.g. Cross Arm Strap)	☐ Mercury Exposure	☐ Mercury containing devices removed prior to demolition ☐ Mercury containing devices removed intact & stored properly ☐ Spill kit
☐ Retractable Device Needed	☐ Fluorescent Bulb Handling (cuts, electrical)	☐ Removed intact & stored properly ☐ Leather gloves ☐ Deenergized prior to removal
☐ Horizontal Life Line	☐ CFC Exposure	☐ CFC units removed prior to demolition ☐ Licensed contractor used for CFC reclamation
☐ Warning Line System	☐ Fall Hazards (holes, wall openings, unprotected sides & edges)	☐ Guardrails ☐ Personal fall arrest systems ☐ Guardrails ☐ Hole covers
☐ Covers & Guardrails	☐ Confined Space	☐ Air testing ☐ Qualified personnel ☐ Hazard evaluation ☐ Communication ☐ PPE ☐ Rescue procedure ☐ Signs posted

Workplace Observation Card Brandenburg

Project Location

Observer Empcd

Observers Name

Date Observed

What Happened (What employee(s) work practice or behavior did you observe?)

Suggested Improvements (What would you suggest to correct unsafe work practice or behavior?)

What tasks were being performed by the employee(s) being observed?

If you made suggestions to correct the unsafe work practice or behavior, were they implemented?

Y N

SAF-59

Workplace Observation Card Brandenburg

Work Practice and Behavior

Safe	Categories	Unsafe
	Safety Glasses, Eye & Face Protection	
	Gloves, Long Sleeves, Proper Clothing	
	Fall Protection	
	Hearing Protection	
	Respirator Use	
	Work Boots, Hard Hats, Vests	
	Torch Use	
	Tool Use	
	Scaffold & Ladder Use	
	Manual Lifting	
	Material Handling	
	Fit for Duty	
	Proximity to Machinery	
	Hazard Awareness	
	Attitude	
	Body Position	
	Manlift Use	
	Trailer Loading	
	Operating Heavy Equipment	
	Motor Vehicle Safety	
	Rigging	
	Electrical Safety	
	Signs & Barricades	
	Slips, Trips & Falls	
	Fire Prevention & Protection	
	Dust Control	
	Housekeeping	
	Other	

SAF-59

Workplace Observation Card Brandenburg

Ubicación del Proyecto

Observador Empcd

Nombre del Observador

Fecha Observado

Qué Pasó (¿Qué práctica del trabajo o comportamiento del empleado (s) se observo?)

Mejores Sugerencias (Qué sugeriría usted para corregir las prácticas de trabajo inseguras o comportamiento?)

Qué tareas se están realizando por el empleado (s) observado?

Si usted hizo sugerencias para corregir la práctica de trabajo insegura o comportamiento, se implemento?

Si No

SAF-59

Workplace Observation Card Brandenburg

Práctica y Comportamiento del Trabajo

Seguro	Categorías	Inseguro
	Gafas de Seguridad, Protección de Ojos y Facial	
	Guantes, Mangas Largas, Ropa Adecuada	
	Protección Contra Caídas	
	Protección Auditiva	
	El Uso de Respirador	
	Botas de Trabajo, Cascos, Chalecos	
	Uso de Antorcha	
	Uso de Herramienta	
	Uso de Andamios y Escaleras	
	Elevación Manual	
	Manejo de Material	
	Aptitud Para el Servicio	
	La Proximidad a la Maquinaria	
	Consciente de Peligro	
	Actitud	
	Posición del Cuerpo	
	Uso de Manlift	
	Carga de Trailer	
	Operación de Equipo Pesado	
	Seguridad en el Automóvil	
	Aparejo	
	Seguridad Eléctrica	
	Signos y Barricadas	
	Los Resbalones, Tropezones y Caídas	
	Prevención y Protección de Incendios	
	Control de Polvo	
	Limpieza	
	Otros	

SAF-59

List suggestions for improvements:

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

(When complete return to Supervisor)

Additional Comments:

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

Brandenburg Projects
SAFETY TASK ANALYSIS CARD

Date: _____

Name: _____

Location: _____

Job Description: _____

_____

_____

REQUIRED PPE

√ Hard Hat

√ Safety Boots with Metatarsals

√ Safety Glasses w/side Shields

ADDITIONAL PPE

Fall Protection

Hearing Protection

Monogoggles

Faceshield

Gloves – Type: _____

Respirator – Type: _____

Cartridge: _____

Protective Clothing

Type: _____

Other PPE needed? _____

_____

What am I doing? - List Task(s)

_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____

What are the possible hazards of doing the task?	√
Chemical Burn	
Thermal Burn	
Particles in Eye	
Overexertion	
Elevated Load	
Overhead Work	
Sprains/Strains	
Soft Tissue Injuries	
Dropping Material	
Live Utilities	
Trips/Slips	
Spills	
Abrasion/Cuts	
Cave-In	
Loud Noise	
Heat/Cold Exposure	
Electric Shock	
Lead/Asbestos	
Moving Machinery	
Contact with Object	
Struck by Object	
Caught in Object	
Fall to Lower Level	
Fall on Same Level	
Overexertion in Lifting	
Repetitive Motion	
Exposed to Harmful Substance_____	
Transportation Accidents	
Fires/Explosions	
Other_____	
Other_____	

What will I do to eliminate/control?	√
Chemical Protective Clothing	
Face Shield/Goggles/ Safety Glasses	
Inspect Scaffold	
Proper Rigging	
Taglines	
Personal Fall Protection	
Toe boards/Netting	
Stretch & Bend	
Materials Secured in Place	
Wet Methods	
Buddy System	
Remove Combustibles	
Fire Watch/Fire Ext.	
Spill Containment/Controls	
Proper Clothing	
Sloping/Shoring	
Hearing Protection	
Check LEL, Oxygen, CO, H2S	
Inspect Tools + Equipment	
Be in Proper Position	
Get the Experts	
Maintain Eye Contact	
Leather Gloves	
Hand Signals/Radio Communication	
Guardrails	
Respiratory Protection	
Hi-Viz Vest	
Signs/ Barricades/ Demarcate Area	
Maintain Housekeeping	
Proper Lifting/Use Machine	
Maintain Safe Distance	
Other:_____	
Other:_____	

Emergency Evacuation Drill Report

Brandenburg®

Building / Project / Area Name	
Date & Time of Evacuation Drill	
Type of Alarm	
Number of Workers Present in Building / Project / Area	
Time of All Clear	
Total Evacuation Time	
Critique	
Supervisor / EH&S Manager Comments	
Supervisor / EH&S Manager Signature	

Emergency Evacuation Drill Report Brandenburg®

ROLL CALL CHECKLIST

No.	Name	Present	Absent	Remarks
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				
21				
22				
23				
24				
25				
26				
27				
28				

Supervisor / EH&S Manager Name: _____

Signature:_____ Date & Time:_____

Brandenburg® Industrial Service Company
2625 S. Loomis
Chicago, IL 60608
Phone (312) 326-5800
FAX (312) 326-5055

Brandenburg®

www.Brandenburg.com

ATTACHMENT 3:
FIGURES

Brandenburg® Industrial Service Company
2625 S. Loomis
Chicago, IL 60608
Phone (312) 326-5800
FAX (312) 326-5055

Brandenburg®

www.Brandenburg.com

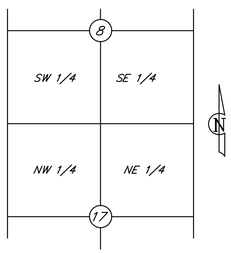
SWPPP SEDIMENT POND SPECIFICATIONS

BANNISTER FEDERAL COMPLEX
PROPERTY TRANSFER AREA

Kansas City, Jackson County, Missouri

LAND DISTURBANCE & EROSION CONTROL PLANS

PROJECT BENCHMARK
XX ☐
XX
XX
XX
Elevation: 000.00



LOCATION MAP
Sec. 8 & 17, Twp. 51 N., Rge. 33 W.
(N.T.S.)

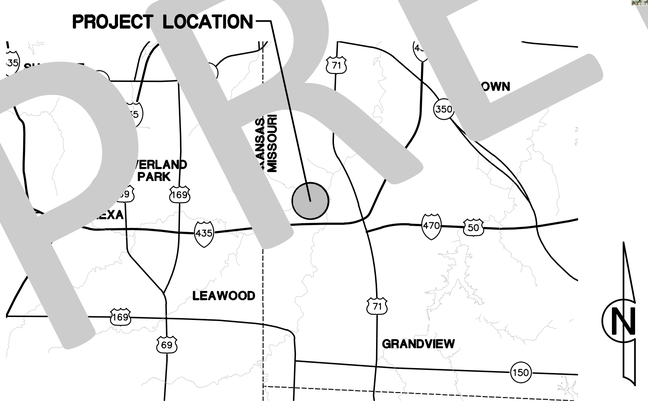
LEGAL DESCRIPTION:

INDEX OF SHEETS

COVER SHEET	01
PHASE 1 OVERALL EXISTING CONDITIONS	02
CONSTRAINT MAP	03
PHASE 1 GENERAL LAYOUT	04
PHASE 1 AREA 1 SITE DISTURBANCE	05
PHASE 1 BASIN 001	06
PHASE 1 AREA 2 SITE DISTURBANCE	07
PHASE 1 BASIN 002	08
PHASE 1 AREA 3 SITE DISTURBANCE	09
PHASE 1 BASIN 003	10
PHASE 1 AREA 4 SITE DISTURBANCE	11
PHASE 1 BASIN 004	12
PHASE 1 DETAIL SHEETS	13-15
PHASE 2 GENERAL LAYOUT	16
PHASE 2 AREA 1 SITE DISTURBANCE	17
PHASE 2 AREA 2 SITE DISTURBANCE	18
PHASE 2 AREA 3 SITE DISTURBANCE	19
PHASE 2 AREA 4 SITE DISTURBANCE	20
PHASE 3 SITE KEY	21
PHASE 3 GENERAL LAYOUT	22
PHASE 3 GRADING	23-24
PHASE 3 AREA 1 SITE DISTURBANCE	25
PHASE 3 AREA 2 SITE DISTURBANCE	26
PHASE 3 AREA 3 SITE DISTURBANCE	27
PHASE 3 AREA 4 SITE DISTURBANCE	28
PHASE 3 DETENTION BASIN 1	29
PHASE 3 DETENTION BASIN 2	30-31
PHASE 3 DETENTION BASIN 3	32-35

NOT INCLUDED

DEVELOPER:
Centerpoint Properties, LLC
1301 Burlington St.
North Kansas City, MO. 64116
Phone #: 816.218.6300
Contact Person: Jim Cross
Email: jcross@centerpoint-prop.com



VICINITY MAP
N.T.S.

, P.E.
Civil Engineer
MO#:"License Number"

Date

MASTER REVISION LIST			
DATE	P.E. SIGNATURE	DESCRIPTION	SHEET(S)

UTILITY SERVICE NUMBERS	
KCMO PUBLIC WORKS	816-513-2627
KCMO WATER SERVICES DEPT.	816-513-2171
MISSOURI GAS ENERGY	816-756-5252
AT&T	800-286-8313
KCP&L	816-471-5275
TIME WARNER CABLE	816-358-5360

CALL BEFORE YOU DIG
1-800-DIG-RITE
MISSOURI ONE CALL SYSTEM

REVIEWED FOR CODE COMPLIANCE
City Planning and Development
Development Services
Land Development Division

- Land Disturbance ☐
- Private Grading ☐
- Public Grading ☐
- Street Design ☐
- Sanitary Sewers ☐
- Storm Sewers ☐

BY:_____

DATE:_____

DEPARTMENT OF CITY PLANNING & DEVELOPMENT
KANSAS CITY, MISSOURI

CONSTRUCTION PERMIT MUST BE SECURED WITHIN ONE YEAR OF REVIEW

Plat No.:
APN No.:
Case No.:
Watershed Name:
File Number:

☐ FOR CODE REVIEW ONLY
☐ REVIEWED FOR CONSTRUCTION

BANNISTER FEDERAL COMPLEX
TRANSFER AREA
LAND DIST. & EROSION CONTROL PLANS
Kansas City, Jackson County, Missouri

Reviewed By:	P.J.O
Designed By:	P.J.O
Drafted By:	G.S.
Lutjen Project No.: 13091	

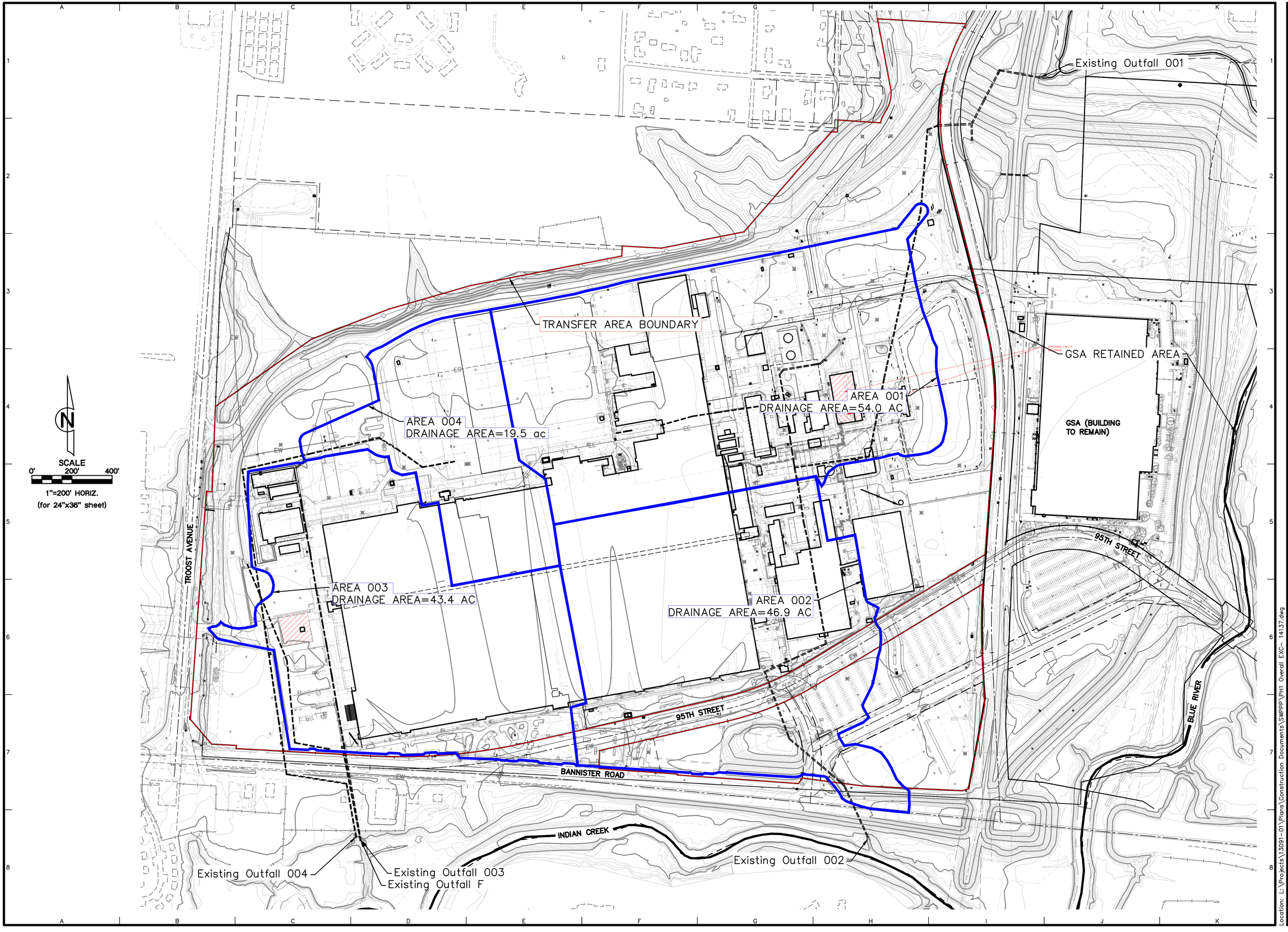
LUTJEN
1301 Burlington, #100
North Kansas City, MO 64116
816.587.4320
816.587.1393 fax
www.lutjen.com
surveying
planning
engineering
landscape architecture

Lutjen, Inc.
MO State Certificate of Authority #:
2007022824

Sheet No.:
01

Location: L:\Projects\13091-01\Plans\construction documents\SWPPP\CSS - 14137.dwg

PREVIEW



OVERALL EXISTING CONDITIONS

BANNISTER FEDERAL COMPLEX
Kansas City, Jackson County, Missouri

DATE	P.E. SIGNATURE	DESCRIPTION

PRELIMINARY

Paul J. Osborne
Civil Engineer
MO#:2001018786

Reviewed By:	P.J.O
Designed By:	J.A.L.
Drafted By:	G.S.
Lutjen Project No.: 14137	

LUTJEN

1301 Burlington, #100
North Kansas City, MO 64116
816.587.4320
816.587.1393 fax
www.lutjen.com

surveying
planning
engineering
landscape architecture

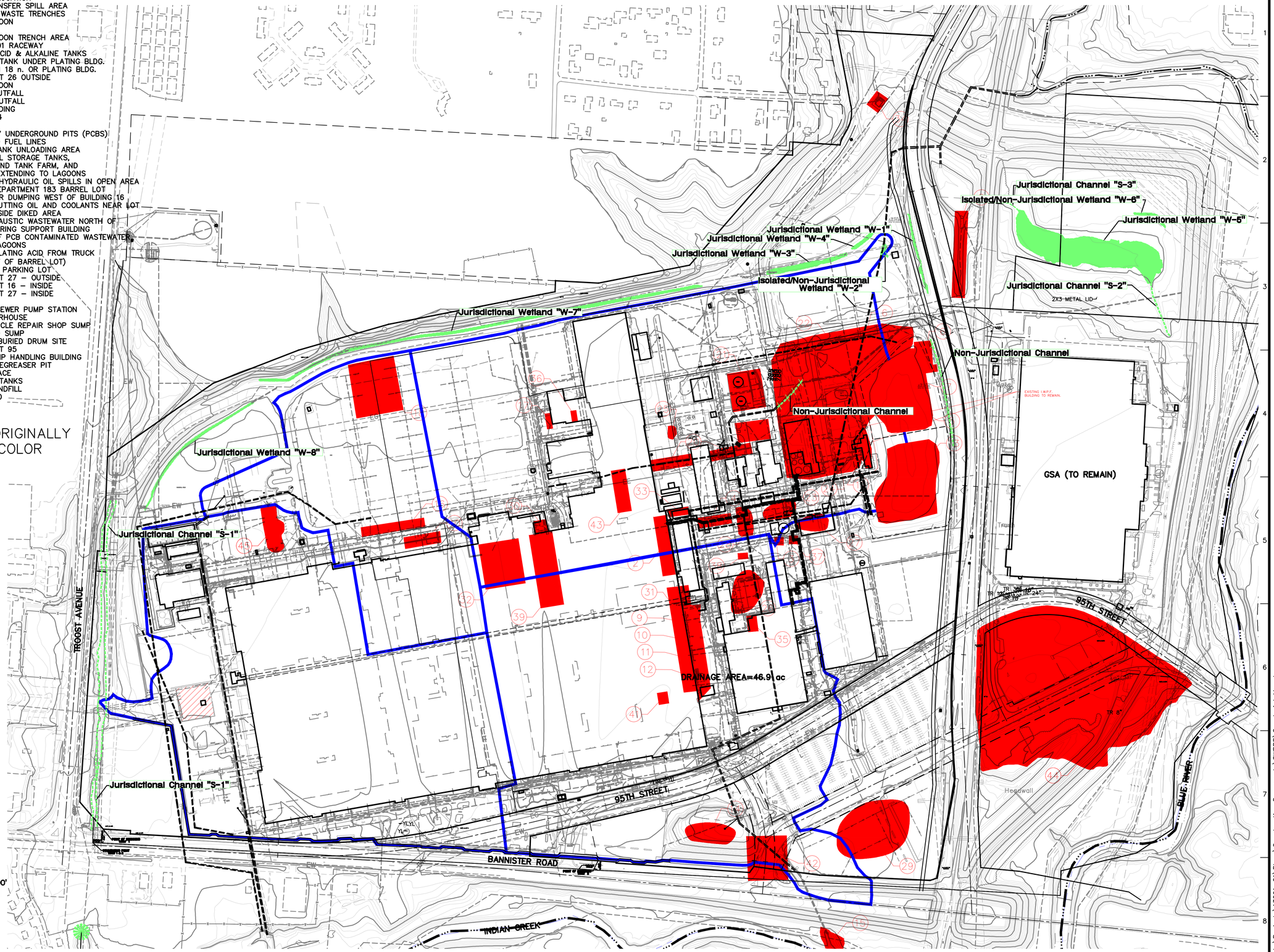
Lutjen, Inc.
MO State Certificate of Authority #: 2007022824

Sheet No.: 02

Location: L:\Projects\13091-01\Plans\Construction Documents\SWPPP\PH1 Overall EXC- 14137.dwg

1	SWMU	UNDERGROUND TANK FARM
2	SWMU	TCE STILL LOCATION
3	SWMU	WASTE TRANSFER SPILL AREA
4	SWMU	CLASSIFIED WASTE TRENCHES
5	SWMU	NORTH LAGOON
6	SWMU	OLD PONDS
7	SWMU	NORTH LAGOON TRENCH AREA
8	SWMU	OUTFALL 001 RACEWAY
9	SWMU	BLDG. 57 ACID & ALKALINE TANKS
10	SWMU	WASTE OIL TANK UNDER PLATING BLDG.
11	SWMU	SUBSTATION 18 n. OR PLATING BLDG.
12	SWMU	DEPARTMENT 26 OUTSIDE
13	SWMU	SOUTH LAGOON
14	SWMU	OLD 002 OUTFALL
15	SWMU	NEW 002 OUTFALL
16	SWMU	SALES BUILDING
17	SWMU	BUILDING 54
18	SWMU	NORTH LOT
19	SWMU	BUILDING 17 UNDERGROUND PITS (PCBS)
20	SWMU	ABANDONED FUEL LINES
21	SWMU	FUEL OIL TANK UNLOADING AREA
22	SWMU	EAST OF OIL STORAGE TANKS, UNDERGROUND TANK FARM, AND BLDG. 15, EXTENDING TO LAGOONS
23	SWMU	PCBS AND HYDRAULIC OIL SPILLS IN OPEN AREA EAST OF DEPARTMENT 183 BARREL LOT
24	SWMU	WASTEWATER DUMPING WEST OF BUILDING 16
25	SWMU	SPILL OF CUTTING OIL AND COOLANTS NEAR LOT 187-L OUTSIDE DIKED AREA
26	SWMU	SPILL OF CAUSTIC WASTEWATER NORTH OF MANUFACTURING SUPPORT BUILDING
27	SWMU	DUMPING OF PCB CONTAMINATED WASTEWATER WEST OF LAGOONS
28	SWMU	SPILL OF PLATING ACID FROM TRUCK (EAST HALF OF BARREL LOT)
29	SWMU	SOUTHEAST PARKING LOT
30	SWMU	DEPARTMENT 27 – OUTSIDE
31	SWMU	DEPARTMENT 16 – INSIDE
32	SWMU	DEPARTMENT 27 – INSIDE
33	SWMU	OIL HOUSE
34	SWMU	SANITARY SEWER PUMP STATION
35	SWMU	EAST BOILERHOUSE
36	SWMU	MAINT. VEHICLE REPAIR SHOP SUMP
37	SWMU	ABANDONED SUMP
38	SWMU	REPORTED BURIED DRUM SITE
39	SWMU	DEPARTMENT 95
40	SWMU	FORMER CHIP HANDLING BUILDING
41	SWMU	DEPT. 20 DEGREASER PIT
42	SWMU	95TH TERRACE
43	SWMU	TEST CELL TANKS
44	SWMU	FORMER LANDFILL
45	SWMU	BUILDING 50

THIS SHEET IS ORIGINALLY PRINTED IN COLOR



CONSTRAINT MAP

BANNISTER FEDERAL COMPLEX
Kansas City, Jackson County, Missouri

DATE	P.E. SIGNATURE	DESCRIPTION

PRELIMINARY

Paul J. Osborne
Civil Engineer
MO#:2001016786

Reviewed By:	P.J.O
Designed By:	J.A.L.
Drafted By:	G.S.
Lutjen Project No.: 14137	

LUTJEN
1301 Burlington, #100
North Kansas City, MO 64116
816.587.4320
816.587.1393 fax
www.lutjen.com
surveying
planning
engineering
landscape architecture
Lutjen, Inc.
MO State Certificate of Authority #: 2007022824

Sheet No.: 03

Location: L:\Projects\13091-01\Plans\Construction Documents\SWPPP\Constraint Map.dwg

Phase 1 Description:

Phase 1 SWPPP efforts provide for the select demolition of buildings, parking lot, and associated infrastructure and subsequent construction of proposed Sediment Basins at each regulated outfall as indicated within the attached exhibits. Existing paved areas are to remain in place during initial building demolition activities. Permiter structure control elements inclusive of vehicle tracking control, silt fencing, diversion berms, inlet control and staging areas will be installed with Phase 1 activities

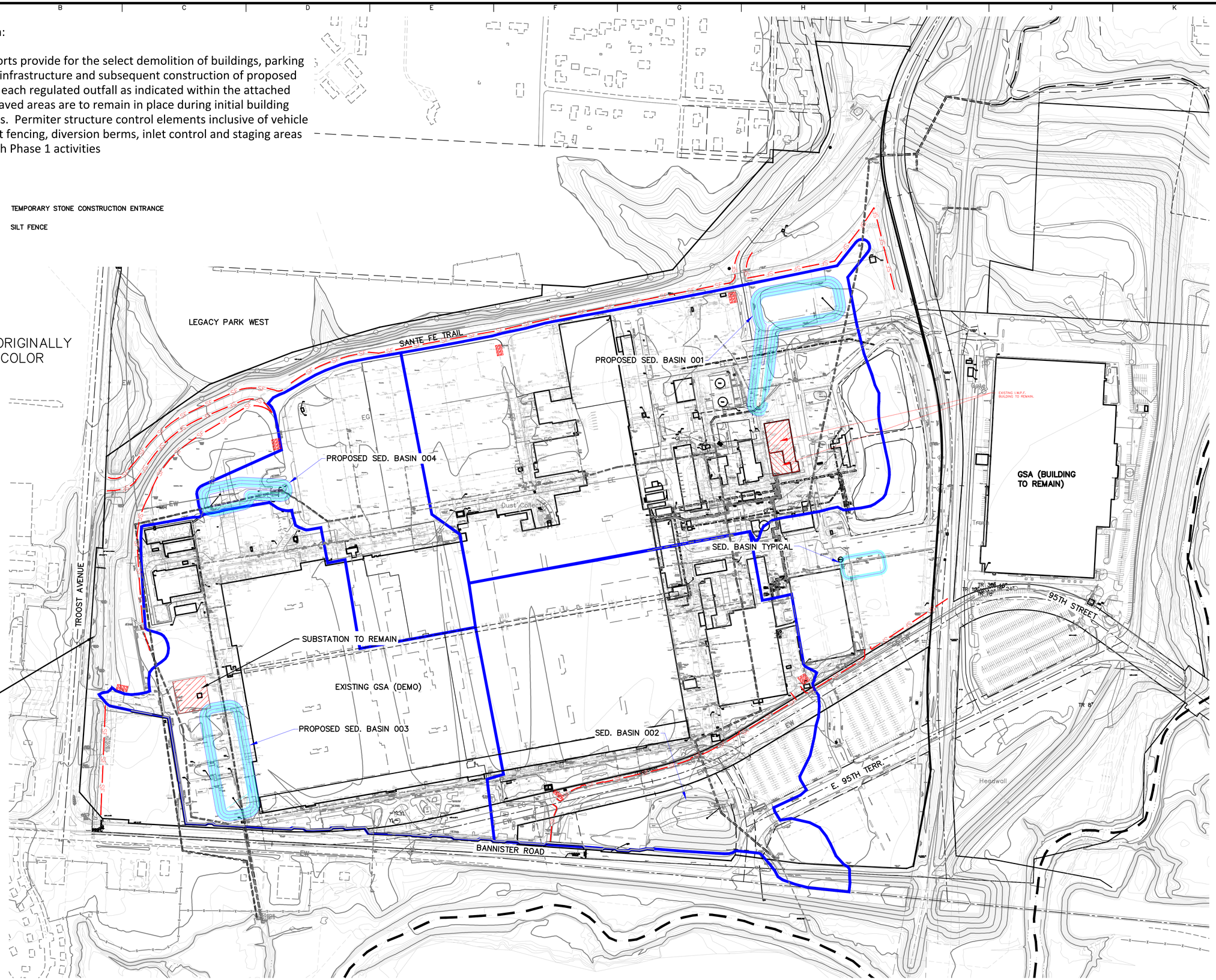
PHASE 1 DEVICES

TEMPORARY STONE CONSTRUCTION ENTRANCE

SILT FENCE

THIS SHEET IS ORIGINALLY PRINTED IN COLOR

SCALE
0' 200' 400'
1"=200' HORIZ.
(for 24"x36" sheet)



PHASE 1 GENERAL LAYOUT

BANNISTER FEDERAL COMPLEX
Kansas City, Jackson County, Missouri

DATE	DESCRIPTION	P.E. SIGNATURE

PRELIMINARY

Paul J. Osborne
Civil Engineer
MO#:2001018786

Reviewed By:	P.J.O
Designed By:	J.A.L.
Drafted By:	G.S.
Lutjen Project No.: 14137	

LUTJEN

1301 Burlington, #100
North Kansas City, MO 64116
816.587.4320
816.587.1393 fax
www.lutjen.com

surveying
planning
engineering
landscape architecture

Lutjen, Inc.
MO State Certificate of Authority #: 2007022824

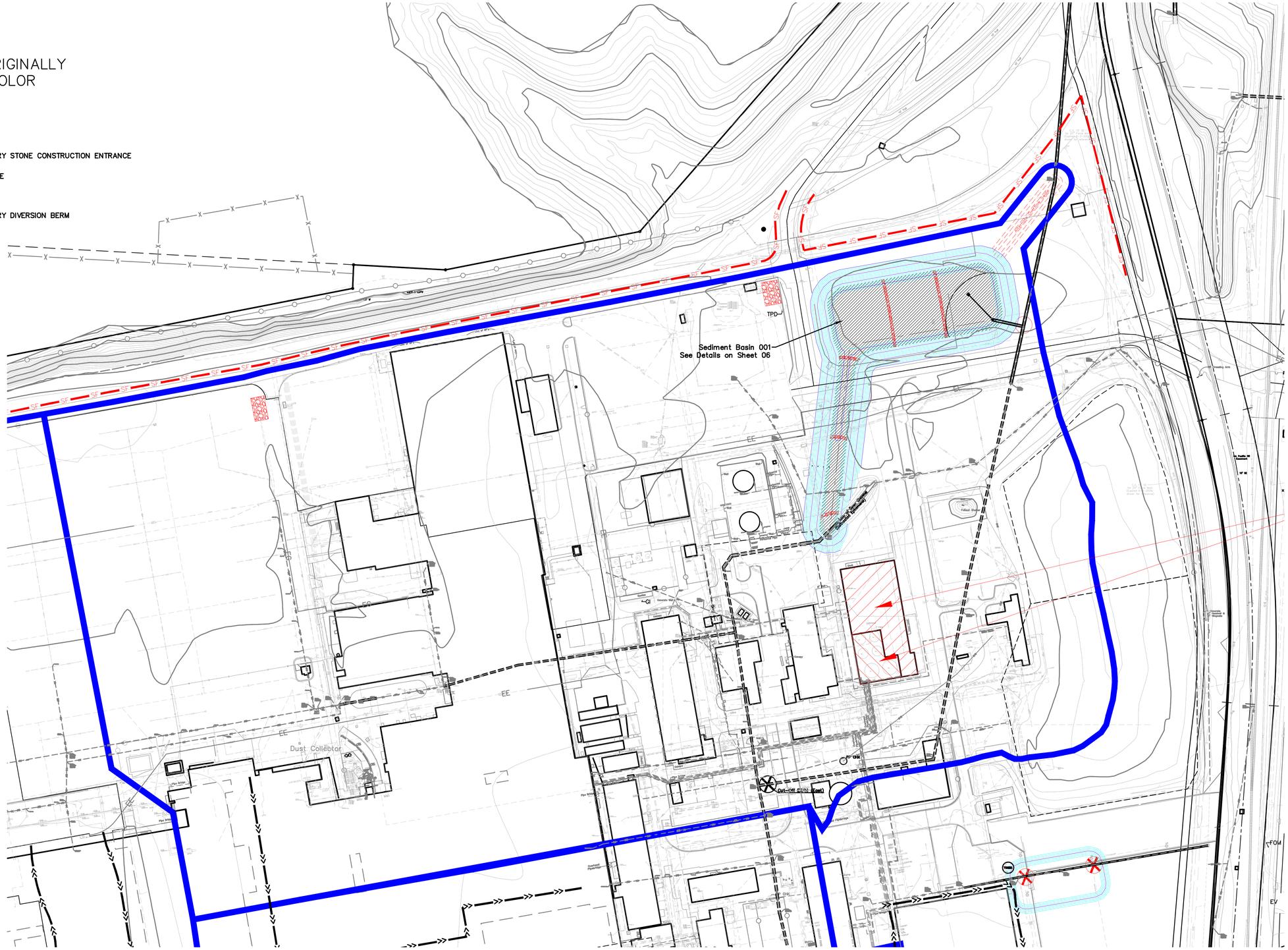
Sheet No.: 04

Location: L:\Projects\13091-01\Plans\construction documents\SWPPP\PH1 General Layout - 14137.dwg

THIS SHEET IS ORIGINALLY PRINTED IN COLOR

PHASE 1 DEVICES

- TEMPORARY STONE CONSTRUCTION ENTRANCE
- SILT FENCE
- RIP RAP
- TEMPORARY DIVERSION BERM



N

SCALE
0' 100' 200'
1"=100' HORIZ.
(for 24"x36" sheet)

PHASE 1 AREA 001 SITE DIST

BANNISTER FEDERAL COMPLEX
Kansas City, Jackson County, Missouri

DATE	P.E. SIGNATURE	DESCRIPTION

PRELIMINARY

Paul J. Osborne
Civil Engineer
MO#:2001018786

Reviewed By:	P.J.O
Designed By:	J.A.L.
Drafted By:	G.S.
Lutjen Project No.:	14137

LUTJEN

1301 Burlington, #100
North Kansas City, MO 64116
816.587.4320
816.587.1393 fax
www.lutjen.com

surveying
planning
engineering
landscape architecture

Lutjen, Inc.
MO State Certificate of Authority #:
2007022824

Sheet No.:
05

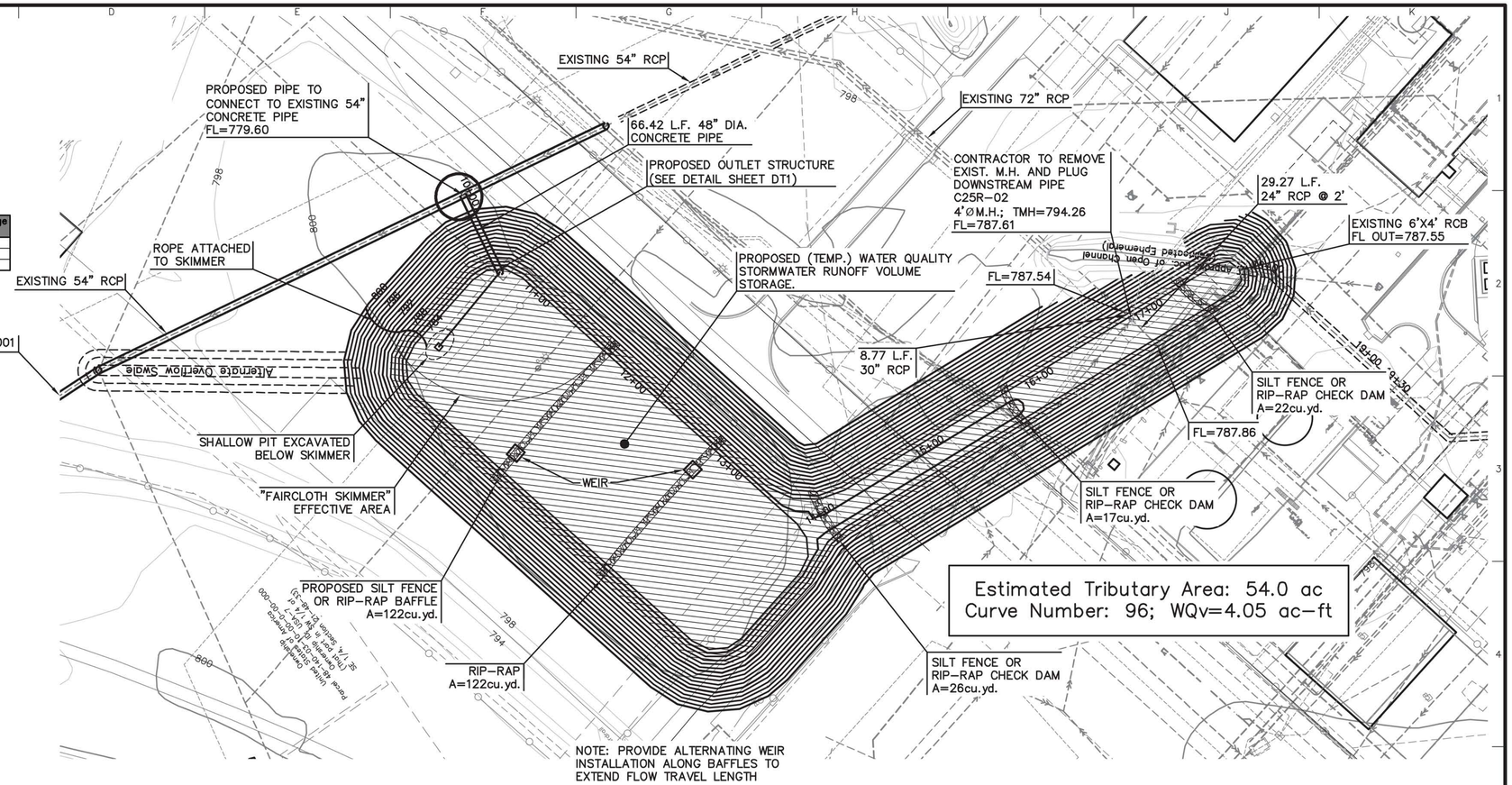
Location: L:\Projects\13091-01\Plans\construction documents\SWPPP\PH1-AREA 1 SD - 14137.dwg

Sediment Basin 001 – Proposed Stage vs. Storage Capacity Table:

Elevation (ft, KC Datum)	Area (ft^2)	Incremental Volume (ac–ft)	Cumulative Volume (ac–ft)
784	40,846	0	0
786	56,274	2.22	2.22
788	66,421	2.813	5.034
790	76,794	3.285	8.318
792	87,393	3.767	12.085
794	98,219	4.259	16.344
796	109,271	4.761	21.105
798	120,549	5.274	26.379

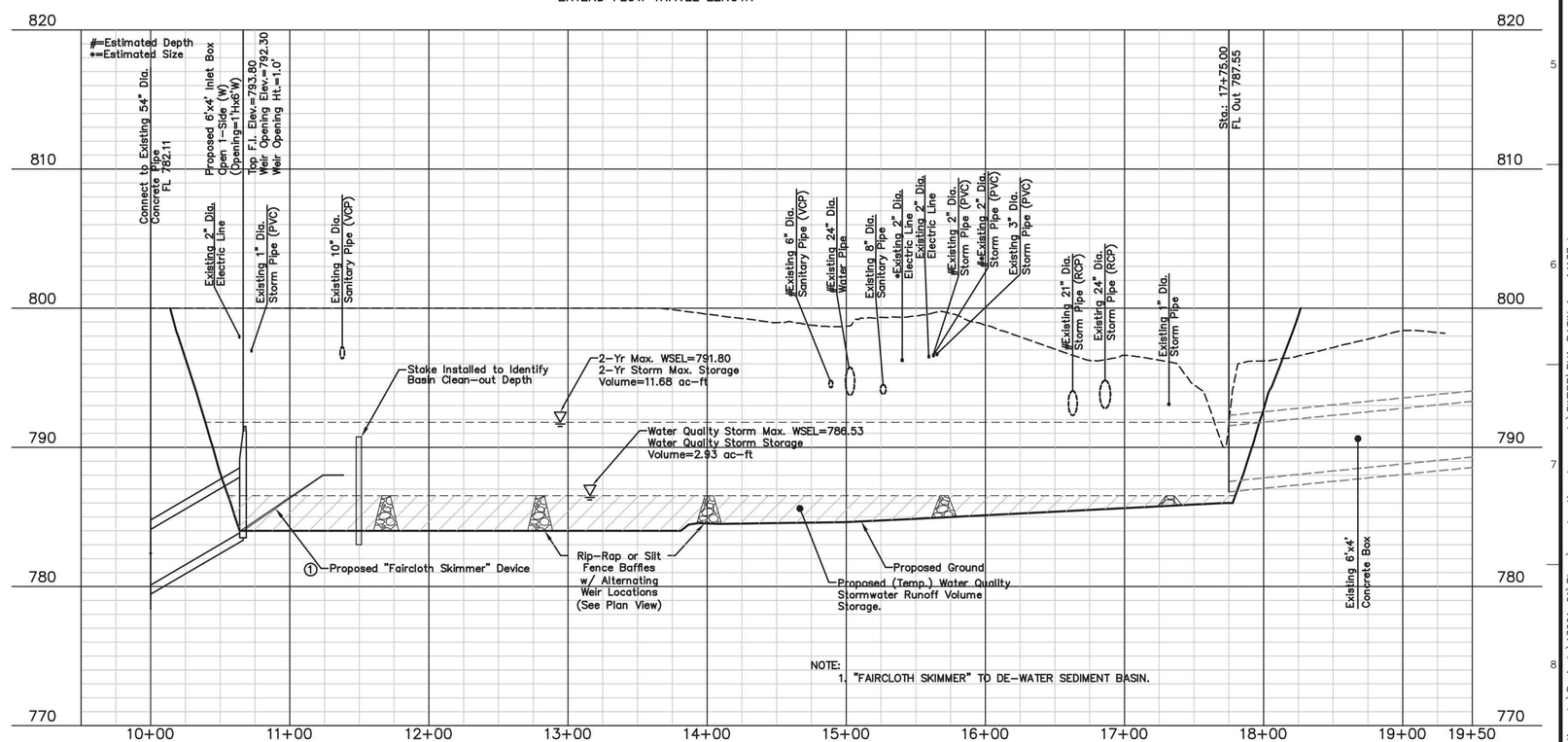
Sediment Basin 001 – Routing Summary Data:

	Basin Peak Inflow Rate (cfs):	Basin Inflow Volume (ac–ft):	Max. Storage Volume (ac–ft):	Max. WSEL (ft, NAVD):	Basin Peak Discharge Rate (cfs):
WQv Storm:	61.96	4.374	2.927	786.53	1.19
2–Year:	182.05	13.704	11.679	791.80	1.19
100–Year:	413.52	32.542	19.712	795.44	52.33



SCALE
0' 50' 100'
1"=50' HORIZ.
0' 2.5' 5'
1"=5' VERT.
(for 24"x36" sheet)

"FAIRCLOTH SKIMMER" NOTES:
AT THE END OF CONSTRUCTION (WHEN THE DRAINAGE AREA IS SUCCESSFULLY STABILIZED) THE BASIN IS CONVERTED TO THE PERMANENT CONFIGURATION. USE A SKIMMER TO CONTROL FILLING AND DRAINING OF THE BASIN AND TO UTILIZE THE SURFACE AREA AND VOLUME TO CREATE CONDITIONS THAT WILL MAXIMIZE SEDIMENTATION. BASIN SIZE DETERMINED FOR THE ENTIRE CATCHMENT TO THE BASIN, NOT JUST THE DISTURBED AREA. THE SKIMMER DRAINS THE ENTIRE BASIN SO THAT SEDIMENT WILL DRY OUT FOR REMOVAL. EXCAVATE A SHALLOW PIT UNDER THE SKIMMER TO CATCH SEDIMENT SO UP AND DOWN MOVEMENT IS NOT RESTRICTED. THE SKIMMER MUST SETTLE DOWN LEVEL SO THAT TRASH DOES NOT FLOW UNDER THE BOTTOM EDGE OF THE FLOAT. OUT FLOW FROM THE SKIMMER WILL STILL BE TURBID SO DISPERSING THE OUTFLOW INTO A WOODED OR VEGETATED BUFFER IS RECOMMENDED FOR ADDITIONAL TREATMENT. PROVIDE POSITIVE DRAINAGE THROUGH THE SKIMMER AND THE PIPE THROUGH THE DAM SO ICE DOES NOT FORM AND CLOG IT. BAFFLES ARE NECESSARY TO KEEP SEDIMENT AWAY FROM THE SKIMMER AND TO LIMIT RESUSPENSION OF ACCUMULATED SEDIMENT; THEY ARE NOT OPTIONAL. PLACE BAFFLES TO ALLOW SEDIMENT REMOVAL WITHOUT DAMAGING THE BAFFLES. THE SKIMMER CANNOT WITHSTAND BEING YANKED AROUND WITH A BACKHOE; USE THE ROPE TO POSITION THE SKIMMER OR PULL IT OUT OF THE WAY TO EXCAVATE UNDER IT. USE THE ROPE CAREFULLY, MANUALLY POSITION THE SKIMMER OR MOVE IT OUT OF THE WAY OF HEAVY EQUIPMENT FOR EXCAVATION. AFTER THE SKIMMER HAS BEEN ASSEMBLED, LAY IT ON THE BOTTOM OF THE BASIN WITH THE FLEXIBLE JOINT AT THE INLET OF THE PIPE THROUGH THE DAM OR AT THE CONNECTION WITH THE RISER. POSITION THE SKIMMER OVER THE EXCAVATED PIT IN THE BASIN. THE SKIMMER SHOULD SETTLE LEVEL ACROSS THE TOP OF THE PIPE WITH THE DOOR ON IT, SO THAT THE DEBRIS GUARDS WORK. ADJUST THE FLEXIBLE JOINT CONNECTION IF NECESSARY, ESPECIALLY IF THE SKIMMER IS PULLED TO THE SIDE AND THE BARREL IS NOT ALIGNED WITH THE OUTLET PIPE. THE FLOAT IS BALANCED SO THAT THE REAR SETTLES DOWN AS THE LAST FEW INCHES OF WATER DRAIN FROM THE BASIN. PLACE A STAKE AT THE CONNECTION OF THE FLEXIBLE JOINT SO THE BACKHOE OPERATOR WILL KNOW THE LOCATION WHEN EXCAVATING ACCUMULATED SEDIMENT FROM UNDER THE SKIMMER AND NOT DAMAGE IT. TIE THE ROPE PROVIDED AROUND THE TEE BETWEEN THE VENT AND THE HORIZONTAL TUBE.SECURE THE OTHER END TO A STAKE ON THE DAM OR SIDE OF THE BASIN. EROSION CONTROL AND CONTROLLING RUNOFF WITHIN THE CATCHMENT IS ESSENTIAL TO PREVENT SEDIMENT GENERATION, PREVENT POLLUTION, AND REDUCE BASIN MAINTENANCE. WHEN THE SEDIMENT STORAGE IN THE BASINS FILLS MAINTENANCE IS REQUIRED TO RESTORE THE TREATMENT VOLUME IN ORDER TO MAINTAIN BASIN EFFICIENCY. SEDIMENT REMOVAL IS NEEDED BEFORE SEDIMENT ACCUMULATES UP TO THE CREST OF THE WEIR IN THE FIRST BAFFLE. EXCAVATE THE SEDIMENT FROM THE ENTIRE BASIN TO RESTORE THE ORIGINAL SEDIMENT STORAGE VOLUME. EXCAVATE THE ENTIRE CELL FORMED BY THE BAFFLE, NOT JUST AROUND THE SKIMMER. MAKE REPAIRS IF DAMAGED, THE POSTS ARE LAID OVER, WATER IS FLOWING UNDERNEATH, OR THE FABRIC HAS FALLEN.



NOTE:
1. "FAIRCLOTH SKIMMER" TO DE–WATER SEDIMENT BASIN.

PHASE 1 SEDIMENT BASIN 001

BANNISTER FEDERAL COMPLEX
Kansas City, Jackson County, Missouri

DATE	P.E. SIGNATURE	DESCRIPTION

PRELIMINARY

Paul J. Osborne
Civil Engineer
MO#:2001018786

Reviewed By:	P.J.O
Designed By:	J.A.L.
Drafted By:	G.S.
Lutjen Project No.: 14137	

LUTJEN
1301 Burlington, #100
North Kansas City, MO 64116
816.587.4320
816.587.1393 fax
www.lutjen.com
surveying
planning
engineering
landscape architecture
Lutjen, Inc.
MO State Certificate of Authority #: 2007022824

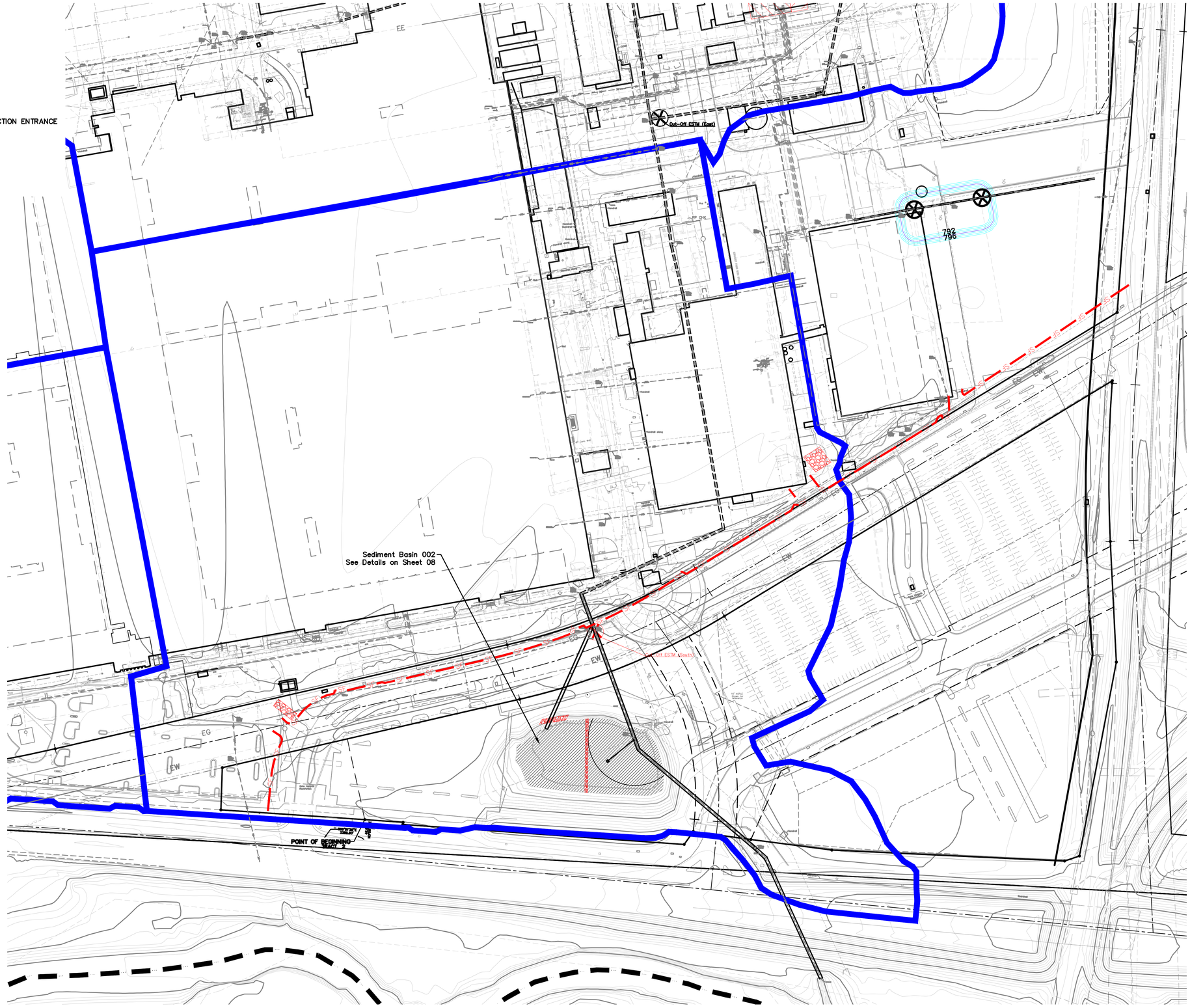
Sheet No.:
06

Location: L:\Projects\13091–01\Plans\construction documents\SWPPP\PH1–BASIN 1 – 14137.dwg

THIS SHEET IS ORIGINALLY PRINTED IN COLOR

PHASE 1 DEVICES

- TEMPORARY STONE CONSTRUCTION ENTRANCE
- SILT FENCE
- RIP RAP
- TEMPORARY DIVERSION BERM



N

SCALE

0' 100' 200'

1"=100' HORIZ.

(for 24"x36" sheet)

PHASE 1 AREA 002 SITE DIST

BANNISTER FEDERAL COMPLEX

Kansas City, Jackson County, Missouri

DATE	P.E. SIGNATURE	DESCRIPTION

PRELIMINARY

Paul J. Osborne
Civil Engineer
MO#:2001018786

Reviewed By:	P.J.O
Designed By:	J.A.L.
Drafted By:	G.S.
Lutjen Project No.: 14137	

LUTJEN

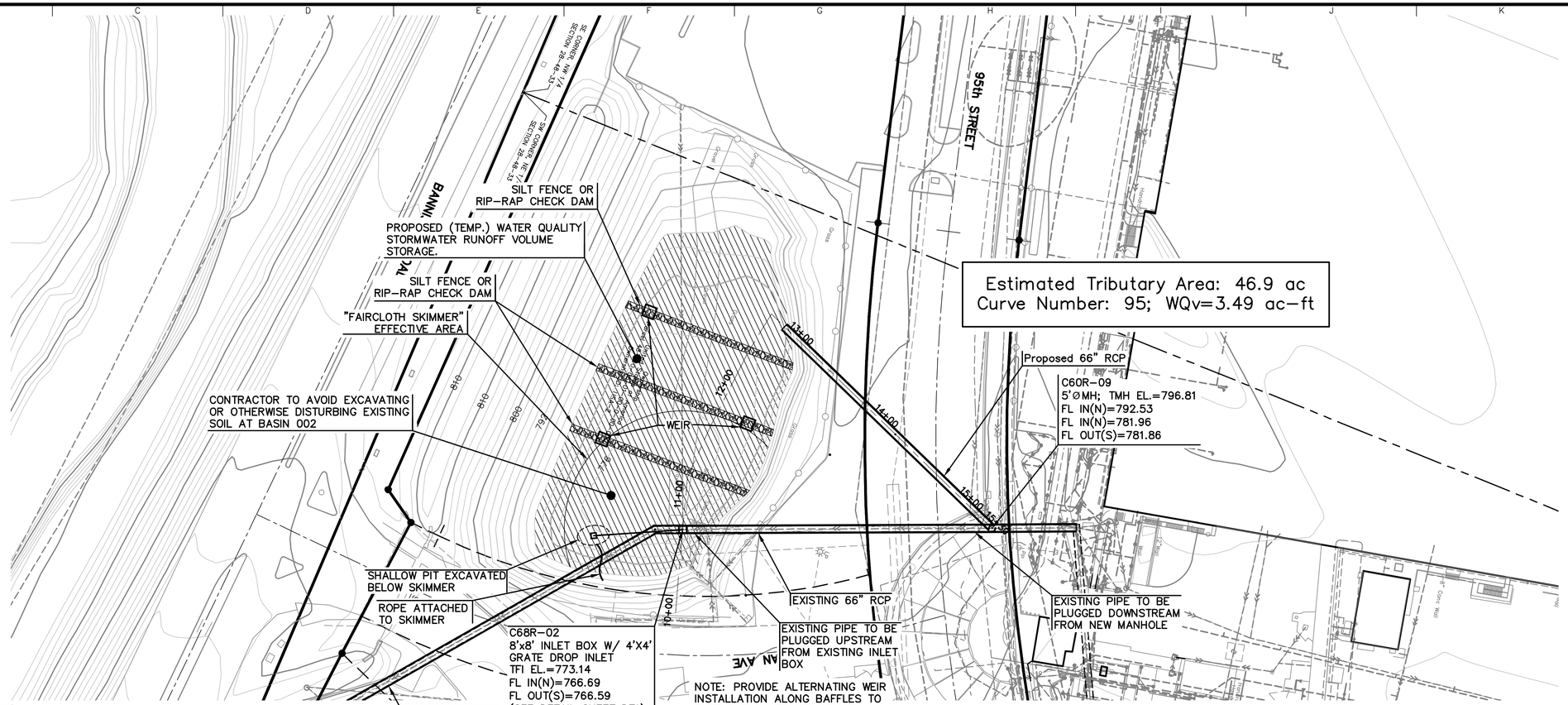
1301 Burlington, #100
North Kansas City, MO 64116
816.587.4320
816.587.1393 fax
www.lutjen.com

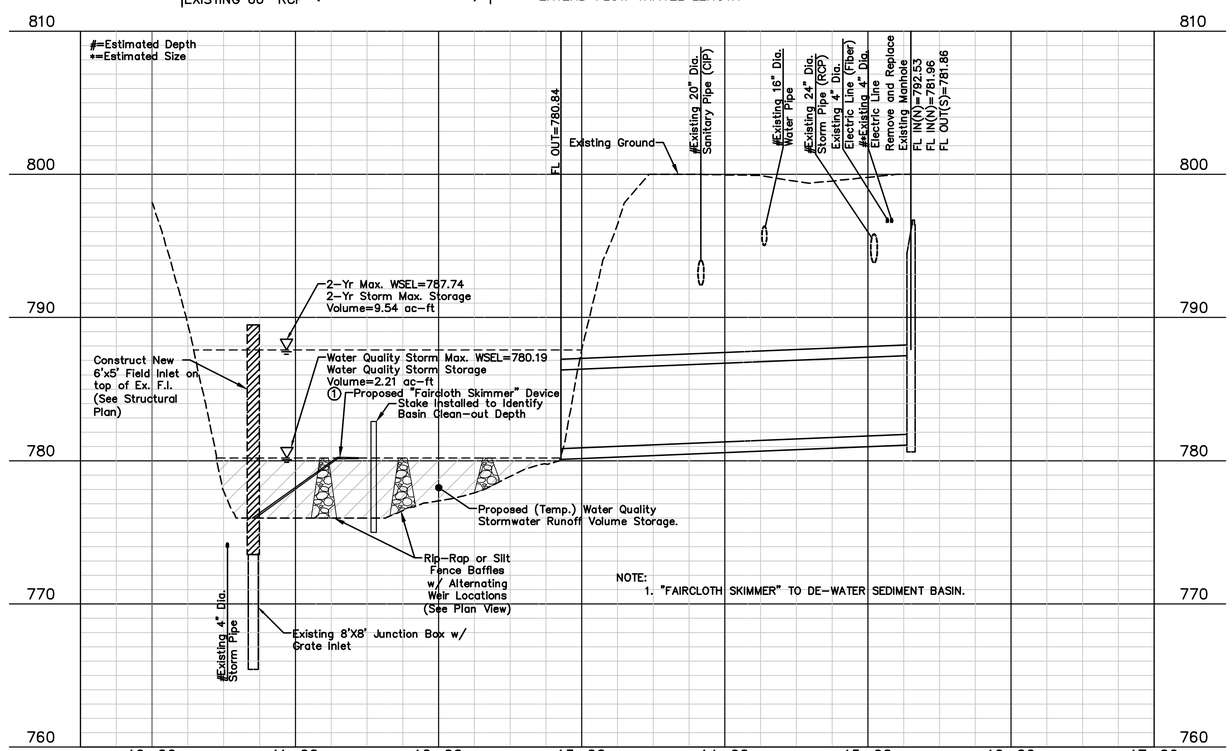
surveying
planning
engineering
landscape architecture

Lutjen, Inc.
MO State Certificate of Authority #: 2007022824

Sheet No.:
07

Location: L:\Projects\13091-01\Plans\construction documents\SWPPP\PH1-AREA 2 SD - 14137.dwg





Sediment Basin 002 – Proposed Stage vs. Storage Capacity Table:

Elevation (ft, KC Datum)	Area (ft^2)	Incremental Volume (ac-ft)	Cumulative Volume (ac-ft)
774	0	0	0
776	9,983	0.153	0.153
778	21,512	0.706	0.859
780	31,637	1.213	2.072
782	37,629	1.588	3.660
784	42,657	1.842	5.502
786	47,499	2.069	7.571
788	52,169	2.287	9.858
790	57,154	2.509	12.367
792	62,435	2.744	15.111
794	68,016	2.994	18.105
796	74,086	3.261	21.366
798	82,847	3.601	24.967

Sediment Basin 002 – Routing Summary Data:

	Basin Peak Inflow Rate (cfs):	Basin Inflow Volume (ac-ft):	Max. Storage Volume (ac-ft):	Max. WSEL (ft, NAVD):	Basin Peak Discharge Rate (cfs):
WQv Storm:	50.09	3.491	2.210	780.19	1.19
2-Year:	155.06	11.487	9.544	787.74	1.19
100-Year:	357.25	27.798	16.026	792.63	59.52

PHASE 1 BASIN 002

BANNISTER FEDERAL COMPLEX
Kansas City, Jackson County, Missouri

DATE	P.E. SIGNATURE	DESCRIPTION

PRELIMINARY

Paul J. Osborne
Civil Engineer
MO#:2001018786

Reviewed By:	P.J.O
Designed By:	J.A.L.
Drafted By:	G.S.
Lutjen Project No.:	14137

LUTJEN
1301 Burlington, #100
North Kansas City, MO 64116
816.587.4320
816.587.1393 fax
www.lutjen.com
surveying
planning
engineering
landscape architecture
Lutjen, Inc.
MO State Certificate of Authority #: 2007022824

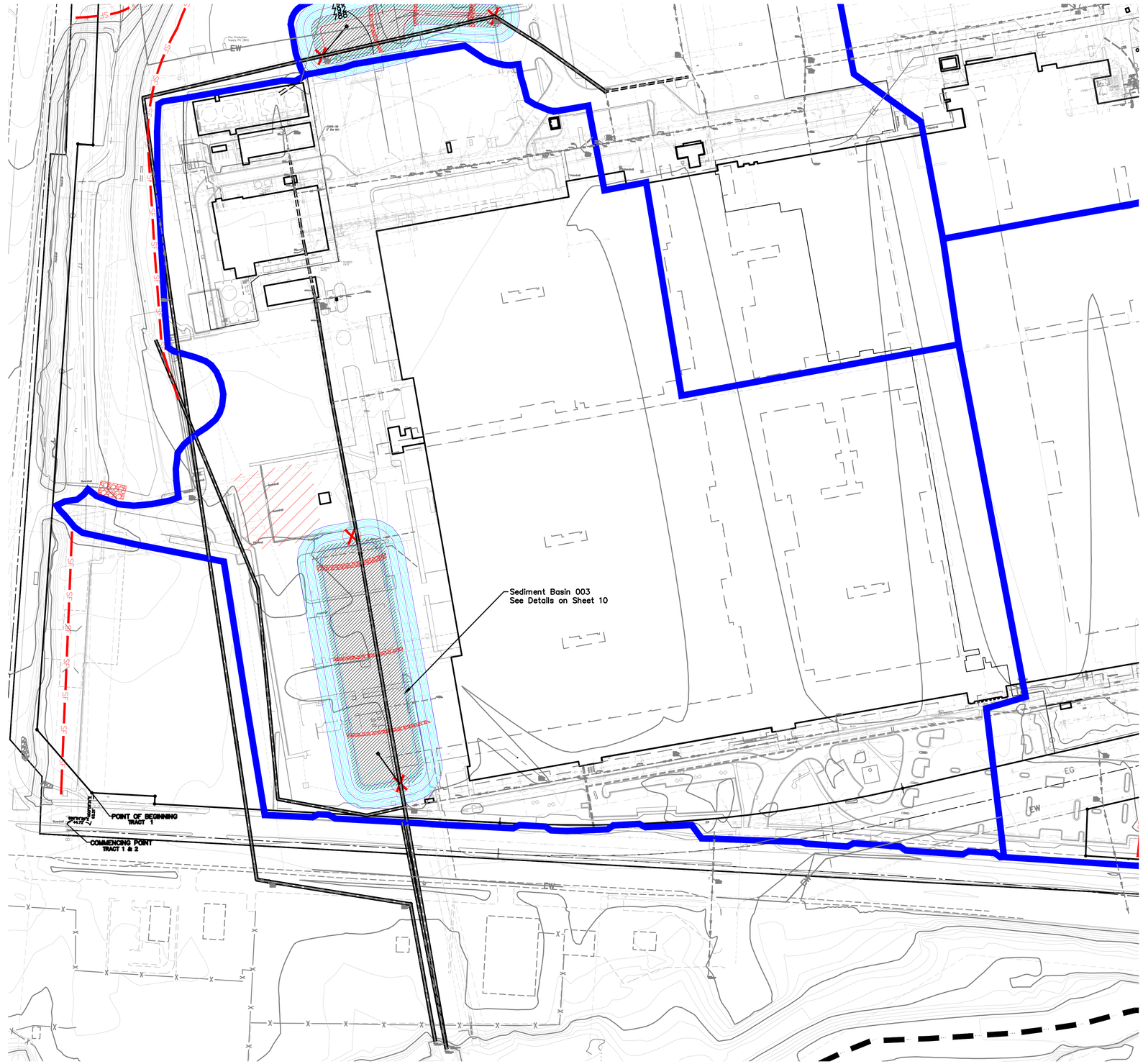
Sheet No.: 08

Location: L:\Projects\13091-01\Plans\construction documents\SWPPP\PH1-BASIN 2 - 14137.dwg

THIS SHEET IS ORIGINALLY PRINTED IN COLOR

PHASE 1 DEVICES

- TEMPORARY STONE CONSTRUCTION ENTRANCE
- SILT FENCE
- RIP RAP
- TEMPORARY DIVERSION BERM



N

SCALE

0' 100' 200'

1"=100' HORIZ.
(for 24"x36" sheet)

PHASE 1 AREA 003 SITE DIST

BANNISTER FEDERAL COMPLEX
Kansas City, Jackson County, Missouri

DATE	P.E. SIGNATURE	DESCRIPTION

PRELIMINARY

Paul J. Osborne
Civil Engineer
MO#:2001015786

Reviewed By:	P.J.O
Designed By:	J.A.L.
Drafted By:	G.S.
Lutjen Project No.: 14137	

LUTJEN

1301 Burlington, #100
North Kansas City, MO 64116
816.587.4320
816.587.1393 fax
www.lutjen.com

surveying
planning
engineering
landscape architecture

Lutjen, Inc.
MO State Certificate of Authority #: 2007022824

Sheet No.:
09

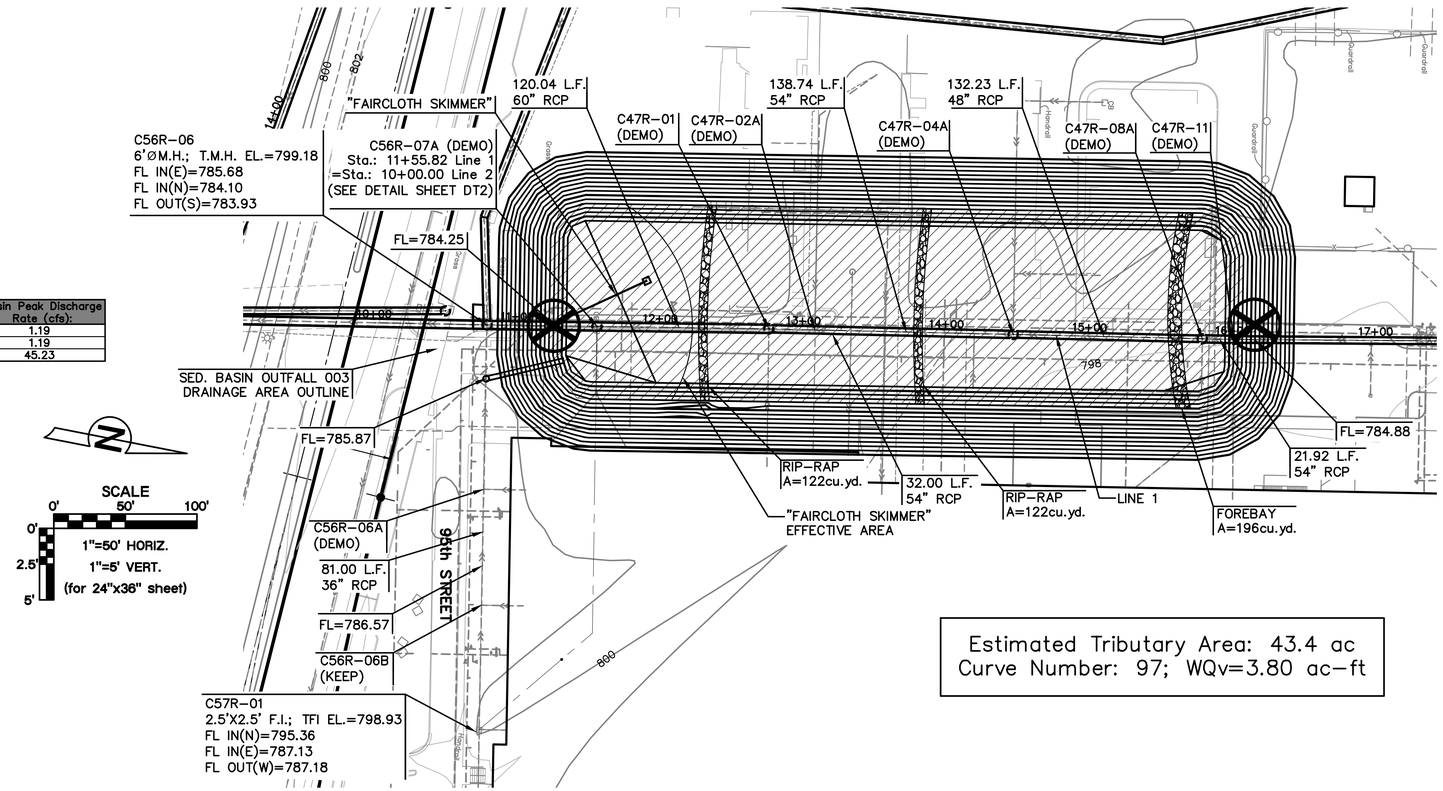
Location: L:\Projects\13091-01\Plans\construction documents\SWPPP\PH1-AREA 3 SD - 14137.dwg

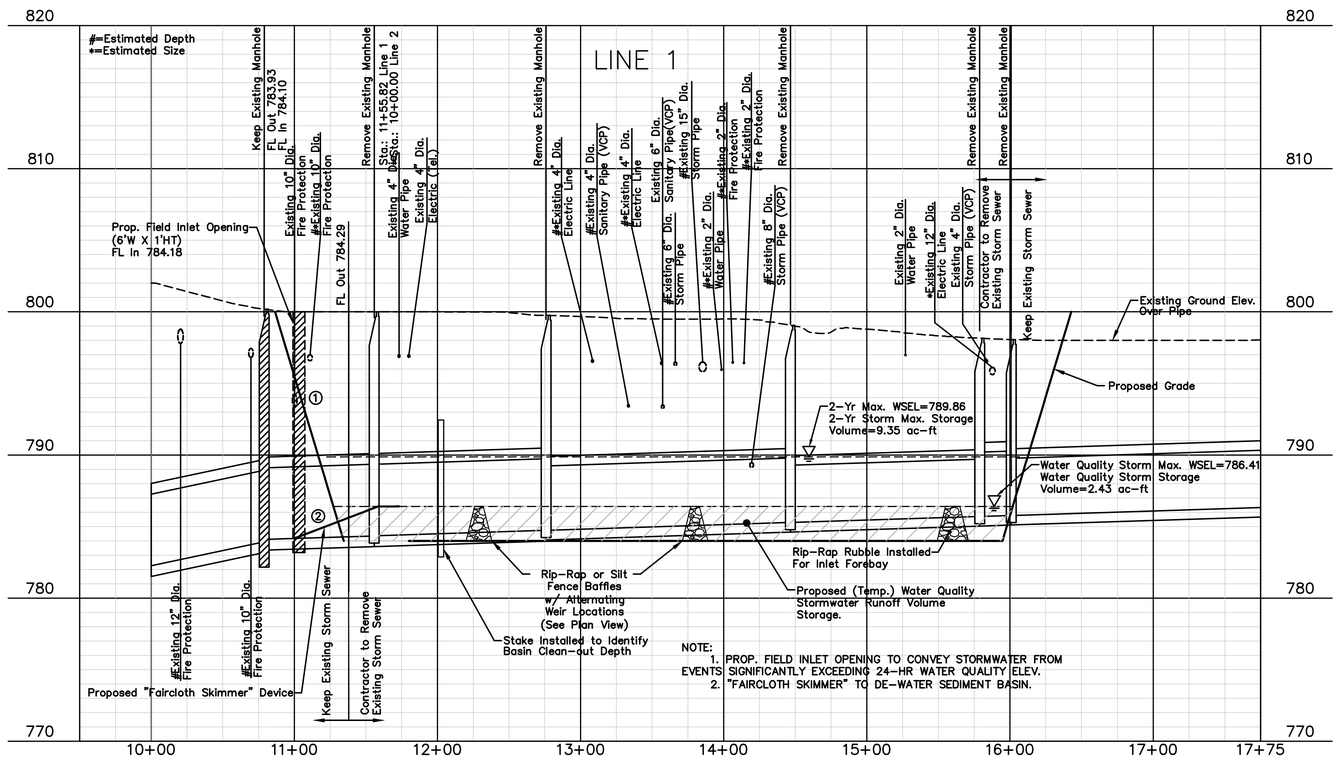
Sediment Basin 003 – Proposed Stage vs. Storage Capacity Table:

Elevation (ft, KC Datum)	Area (ft^2)	Incremental Volume (ac–ft)	Cumulative Volume (ac–ft)
785	68,639	0	0
786	77,675	1.678	1.678
788	86,938	3.777	5.455
790	96,428	4.208	9.663
792	106,143	4.649	14.312
794	116,085	5.100	16.412
796	126,253	5.562	24.973
798	136,647	6.034	31.007

Sediment Basin 003 – Routing Summary Data:

	Basin Peak Inflow Rate (cfs):	Basin Inflow Volume (ac–ft):	Max. Storage Volume (ac–ft):	Max. WSEL (ft, NAVD):	Basin Peak Discharge Rate (cfs):
WQv Storm:	53.18	3.828	2.425	786.41	1.19
2–Year:	148.80	11.414	9.351	789.86	1.19
100–Year:	333.92	26.598	15.933	792.66	45.23





NOTE:
1. PROP. FIELD INLET OPENING TO CONVEY STORMWATER FROM EVENTS SIGNIFICANTLY EXCEEDING 24–HR WATER QUALITY ELEV.
2. "FAIRCLOTH SKIMMER" TO DE–WATER SEDIMENT BASIN.

PHASE 1 BASIN 003

BANNISTER FEDERAL COMPLEX
Kansas City, Jackson County, Missouri

DATE	P.E. SIGNATURE	DESCRIPTION

PRELIMINARY

Paul J. Osborne
Civil Engineer
MO#:2001018786

Reviewed By:	P.J.O
Designed By:	J.A.L.
Drafted By:	G.S.
Lutjen Project No.: 14137	

LUTJEN
1301 Burlington, #100
North Kansas City, MO 64116
816.587.4320
816.587.1393 fax
www.lutjen.com
surveying
planning
engineering
landscape architecture
Lutjen, Inc.
MO State Certificate of Authority #: 2007022824

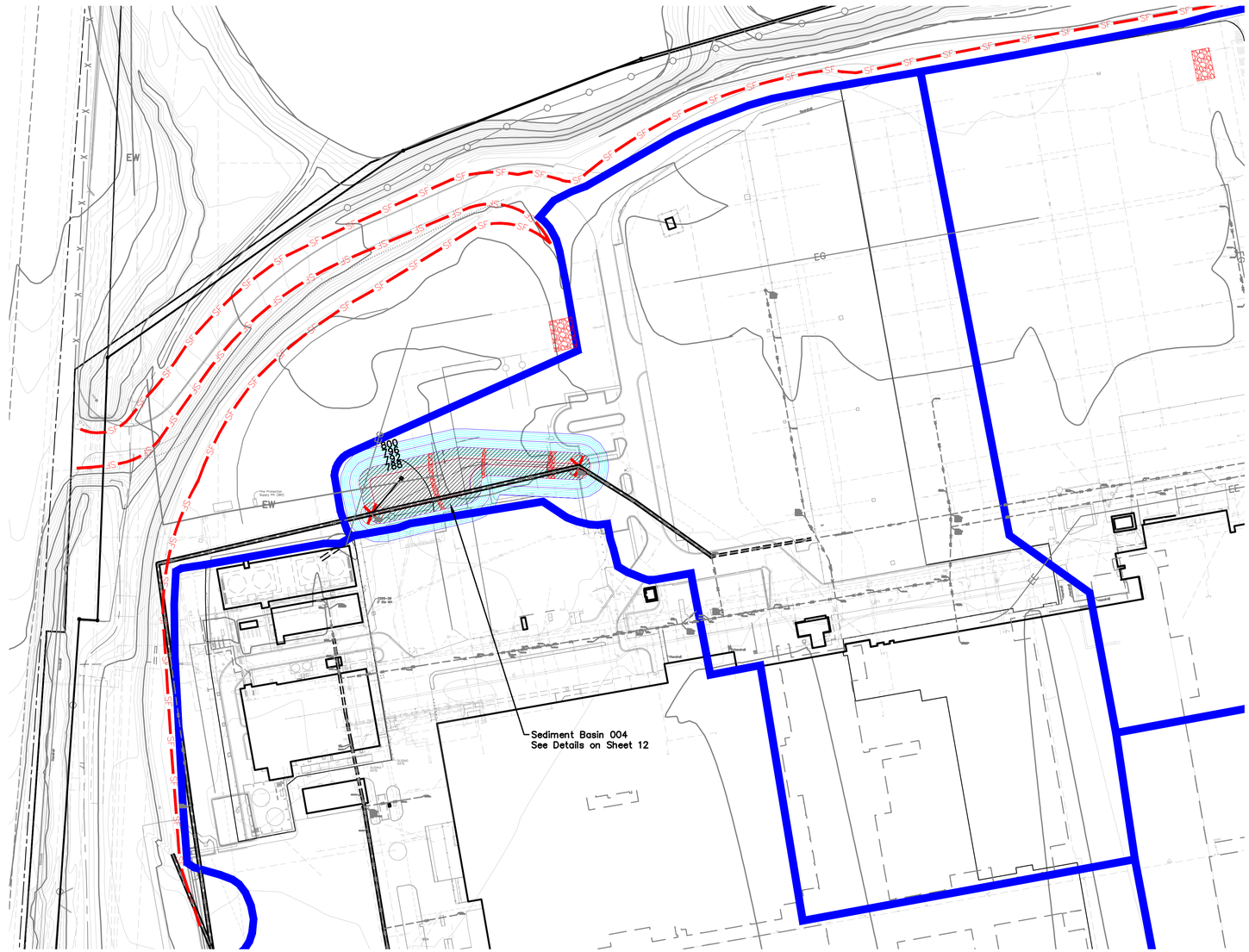
Sheet No.: 10

Location: L:\Projects\13091–01\Plans\Construction Documents\SWPPP\PH1–BASIN 3 – 14137.dwg

THIS SHEET IS ORIGINALLY
PRINTED IN COLOR

PHASE 1 DEVICES

- TEMPORARY STONE CONSTRUCTION ENTRANCE
- SILT FENCE
- RIP RAP
- TEMPORARY DIVERSION BERM



N

SCALE
0' 100' 200'
1"=100' HORIZ.
(for 24"x36" sheet)

PHASE 1 AREA 004 SITE DIST

BANNISTER FEDERAL COMPLEX
Kansas City, Jackson County, Missouri

DATE	P.E. SIGNATURE	DESCRIPTION

PRELIMINARY

Paul J. Osborne
Civil Engineer
MO#:2001018786

Reviewed By:	P.J.O
Designed By:	J.A.L.
Drafted By:	G.S.
Lutjen Project No.: 14137	

LUTJEN

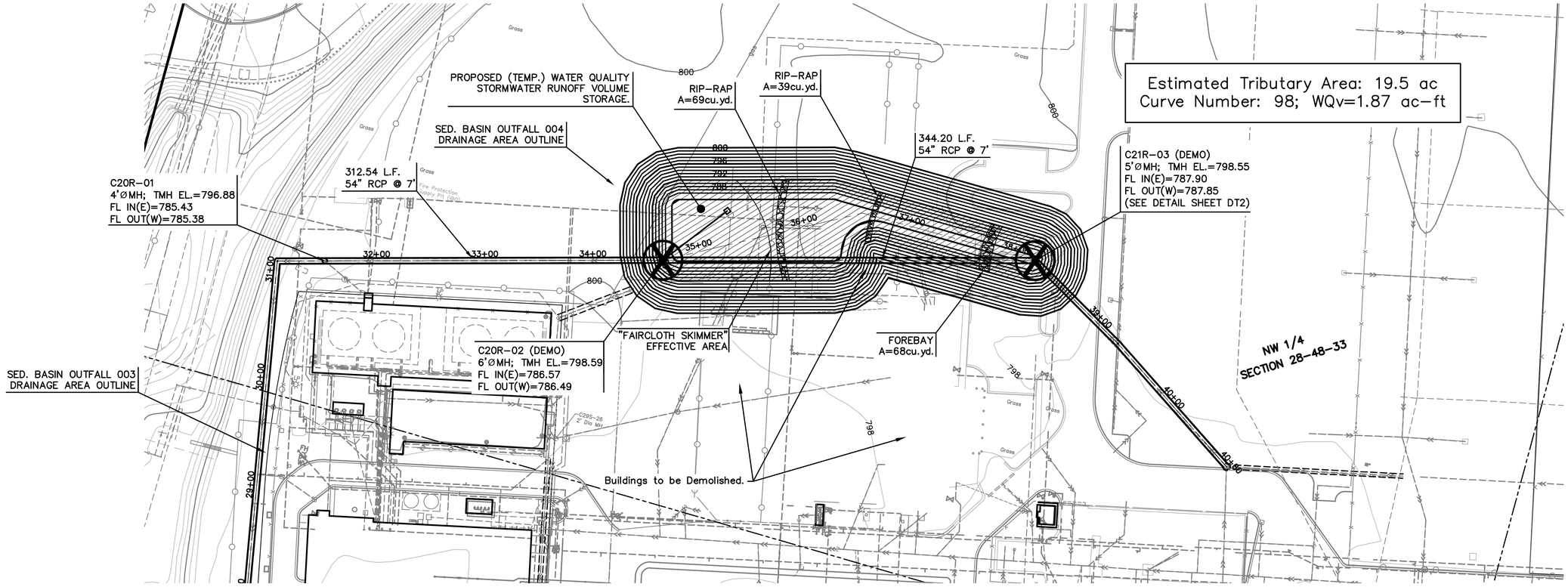
1301 Burlington, #100
North Kansas City, MO 64116
816.587.4320
816.587.1393 fax
www.lutjen.com

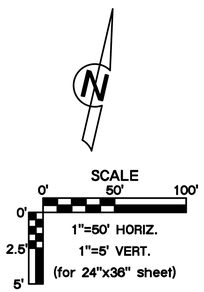
surveying
planning
engineering
landscape architecture

Lutjen, Inc.
MO State Certificate of Authority #: 2007022824

Sheet No.:
11

Location: L:\Projects\13091-01\Plans\construction documents\SWPPP\PH1-AREA 4 SD - 14137.dwg



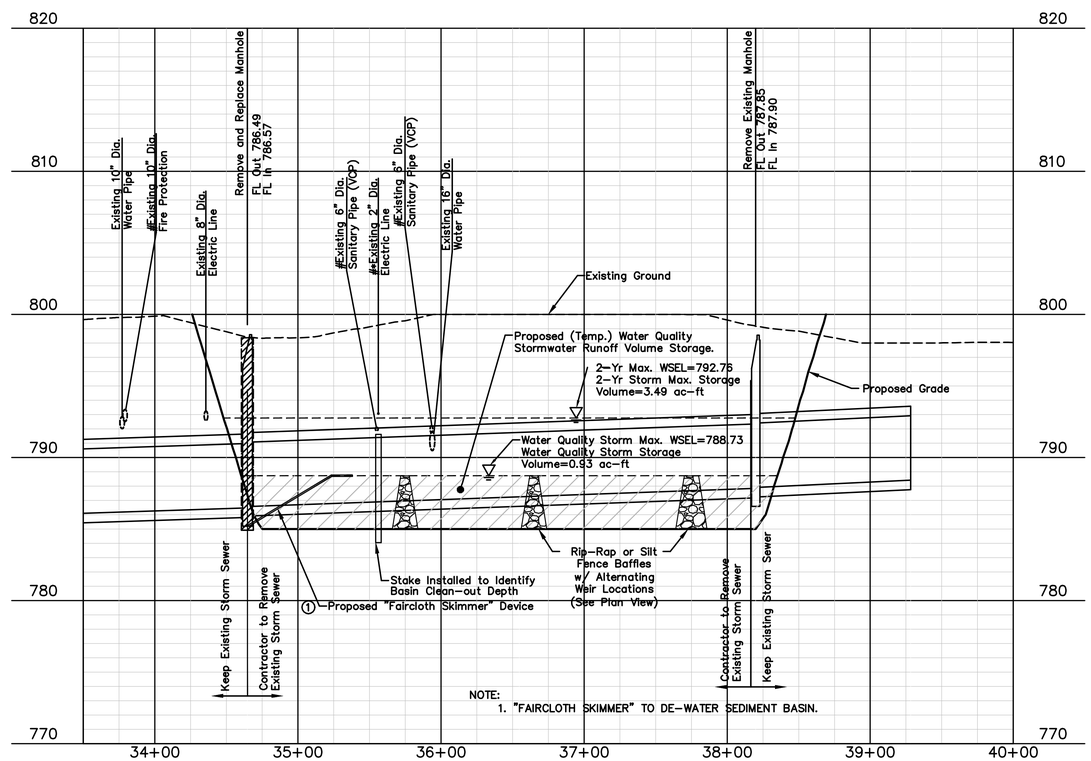


Sediment Basin 004 – Proposed Stage vs. Storage Capacity Table:

Elevation (ft, KC Datum)	Area (ft^2)	Incremental Volume (ac-ft)	Cumulative Volume (ac-ft)
786.6	15,479	0	0
788	20,418	0.575	0.575
790	25,582	1.054	1.629
792	30,973	1.296	2.925
794	36,589	1.549	4.474
796	42,419	1.812	6.287
798	48,454	2.085	8.371

Sediment Basin 004 – Routing Summary Data:

	Basin Peak Inflow Rate (cfs):	Basin Inflow Volume (ac-ft):	Max. Storage Volume (ac-ft):	Max. WSEL (ft, NAVD):	Basin Peak Discharge Rate (cfs):
WQv Storm:	30.65	1.873	0.933	788.73	1.19
2-Year:	82.11	5.309	3.485	792.76	1.19
100-Year:	182.46	12.142	6.259	795.97	44.14



NOTE:
1. "FAIRCLOTH SKIMMER" TO DE-WATER SEDIMENT BASIN.

PHASE 1 BASIN 004

BANNISTER FEDERAL COMPLEX
Kansas City, Jackson County, Missouri

DATE	P.E. SIGNATURE	DESCRIPTION

PRELIMINARY

Joshua Lipscomb
Civil Engineer
MO#:2013011899

Reviewed By:	J.A.L.
Designed By:	J.A.L.
Drafted By:	G.S.
Lutjen Project No.: 14137	

LUTJEN

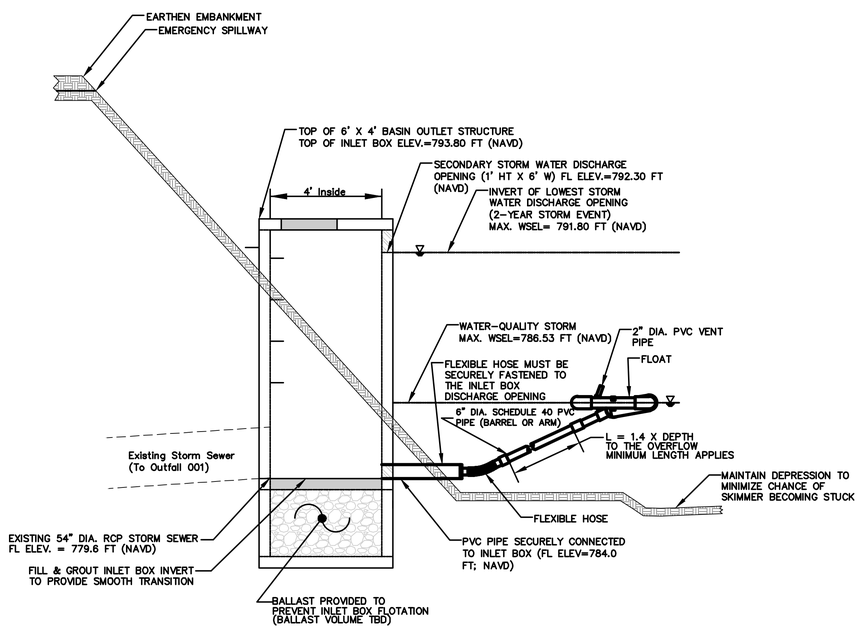
1301 Burlington, #100
North Kansas City, MO 64116
816.587.4320
816.587.1393 fax
www.lutjen.com

surveying
planning
engineering
landscape architecture

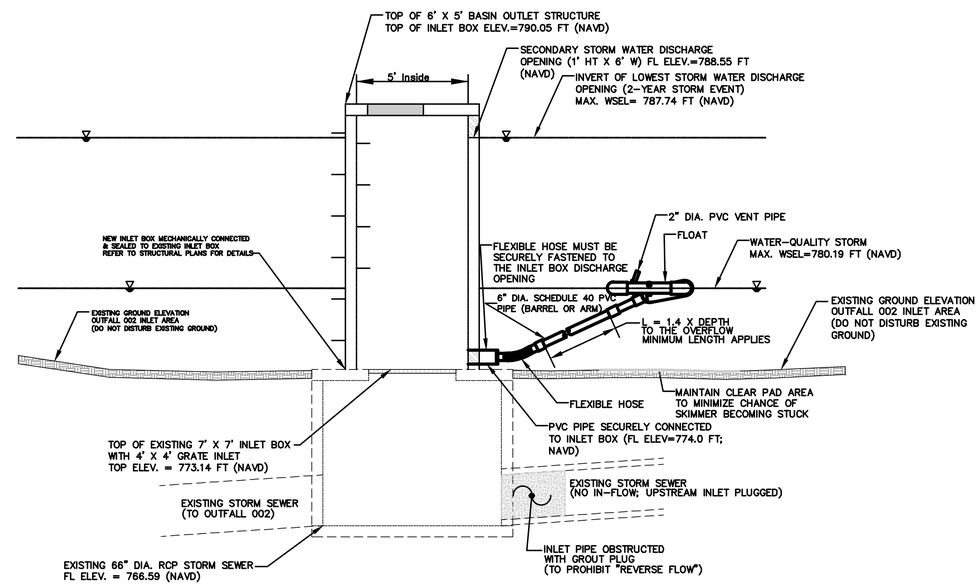
Lutjen, Inc.
MO State Certificate of Authority #: 2007022824

Sheet No.: 12

Location: L:\Projects\13091-01\Plans\Construction Documents\SWPPP\PH1-BASIN 4 - 14137.dwg



SEDIMENT BASIN 001 OUTLET
NTS



SEDIMENT BASIN 002 OUTLET
NTS

DETAIL 1

BANNISTER FEDERAL COMPLEX
Kansas City, Jackson County, Missouri

DATE	P.E. SIGNATURE	DESCRIPTION

PRELIMINARY

Paul J. Osborne
Civil Engineer
MO#:2001018786

Reviewed By:	P.J.O
Designed By:	J.A.L.
Drafted By:	G.S.
Lutjen Project No.: 14137	

LUTJEN

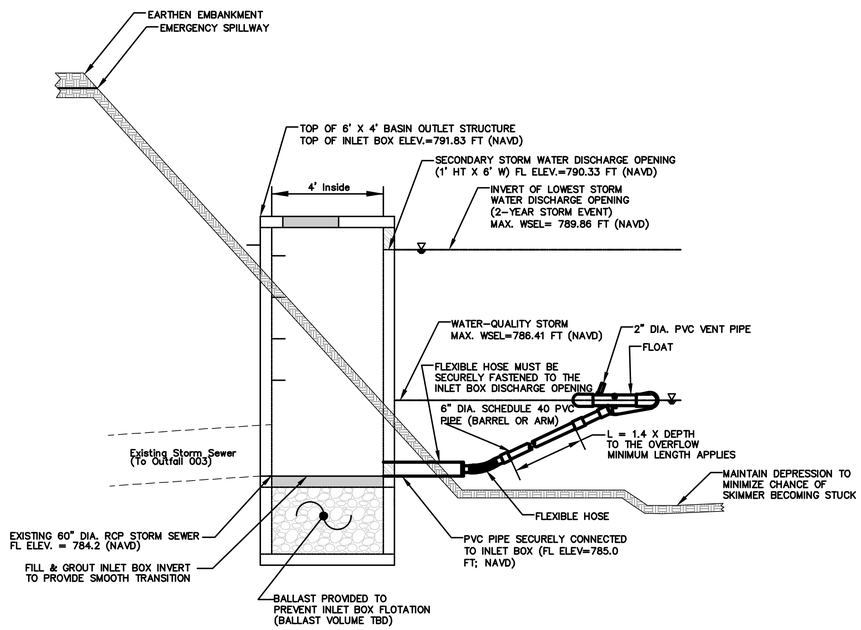
1301 Burlington, #100
North Kansas City, MO 64116
816.587.4320
816.587.1393 fax
www.lutjen.com

surveying
planning
engineering
landscape architecture

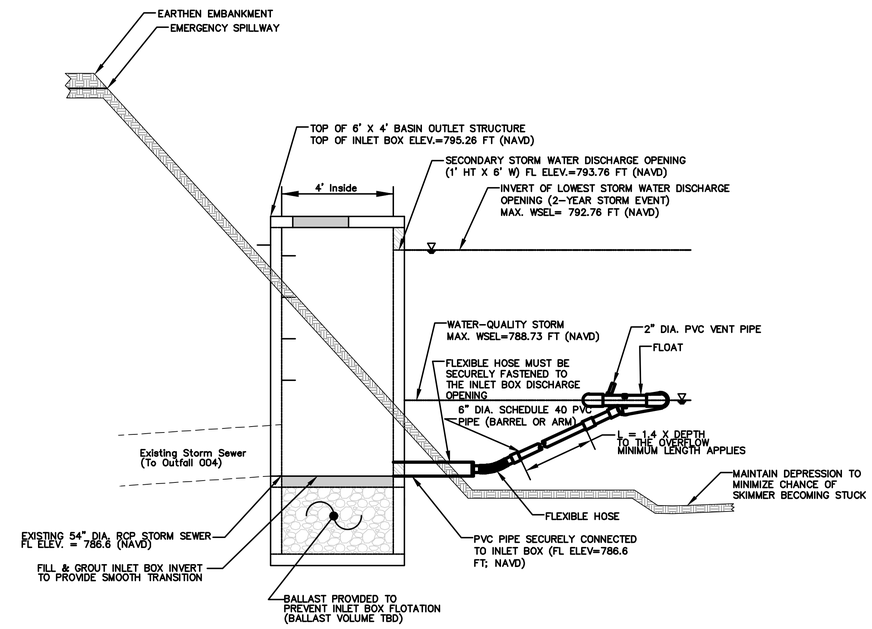
Lutjen, Inc.
MO State Certificate of Authority #: 2007022824

Sheet No.:
13

Location: L:\Projects\13091-01\Plans\construction documents\SWPPP\D11 - 14137.dwg



SEDIMENT BASIN 003 OUTLET
NTS



SEDIMENT BASIN 004 OUTLET
NTS

DETAIL 2

BANNISTER FEDERAL COMPLEX
Kansas City, Jackson County, Missouri

DATE	P.E. SIGNATURE	DESCRIPTION

PRELIMINARY

Paul J. Osborne
Civil Engineer
MO#:2001018786

Reviewed By:	P.J.O
Designed By:	J.A.L.
Drafted By:	G.S.
Lutjen Project No.: 14137	

LUTJEN

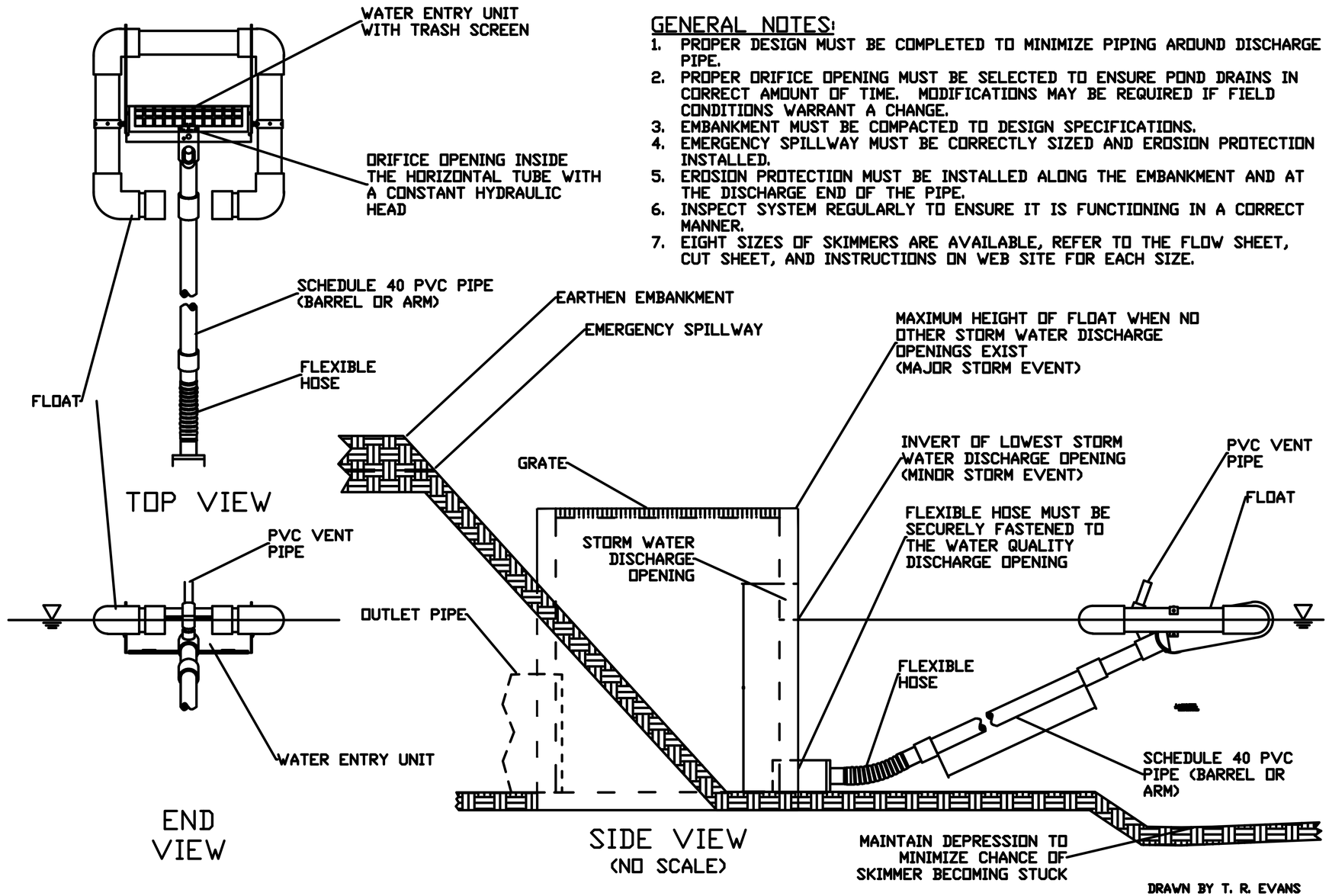
1301 Burlington, #100
North Kansas City, MO 64116
816.587.4320
816.587.1393 fax
www.lutjen.com

surveying
planning
engineering
landscape architecture

Lutjen, Inc.
MO State Certificate
of Authority #:
2007022824

Sheet No.:
14

Location: L:\Projects\13091-01\Plans\construction documents\SWPPP\DT1 - 14137.dwg



GENERAL NOTES:

1. PROPER DESIGN MUST BE COMPLETED TO MINIMIZE PIPING AROUND DISCHARGE PIPE.
2. PROPER ORIFICE OPENING MUST BE SELECTED TO ENSURE POND DRAINS IN CORRECT AMOUNT OF TIME. MODIFICATIONS MAY BE REQUIRED IF FIELD CONDITIONS WARRANT A CHANGE.
3. EMBANKMENT MUST BE COMPACTED TO DESIGN SPECIFICATIONS.
4. EMERGENCY SPILLWAY MUST BE CORRECTLY SIZED AND EROSION PROTECTION INSTALLED.
5. EROSION PROTECTION MUST BE INSTALLED ALONG THE EMBANKMENT AND AT THE DISCHARGE END OF THE PIPE.
6. INSPECT SYSTEM REGULARLY TO ENSURE IT IS FUNCTIONING IN A CORRECT MANNER.
7. EIGHT SIZES OF SKIMMERS ARE AVAILABLE, REFER TO THE FLOW SHEET, CUT SHEET, AND INSTRUCTIONS ON WEB SITE FOR EACH SIZE.

DRAWN BY T. R. EVANS
10/10

FAIRCLOTH SKIMMER®DISCHARGE SYSTEM WITH OUTLET STRUCTURE

J. W. FAIRCLOTH & SON INC.
WWW.FAIRCLOTHSKIMMER.COM
TELEPHONE: (919) 732-1244
FAX: (919) 732-1266
EMAIL: WARREN@FAIRCLOTHSKIMMER.COM

DETAIL 3

BANNISTER FEDERAL COMPLEX
Kansas City, Jackson County, Missouri

DATE	P.E. SIGNATURE	DESCRIPTION

PRELIMINARY

Paul J. Osborne
Civil Engineer
MO#:2001018786

Reviewed By:	P.J.O
Designed By:	J.A.L.
Drafted By:	G.S.
Lutjen Project No.: 14137	

LUTJEN
1301 Burlington, #100
North Kansas City, MO 64116
816.587.4320
816.587.1393 fax
www.lutjen.com
surveying
planning
engineering
landscape architecture
Lutjen, Inc.
MO State Certificate of Authority #: 2007022824

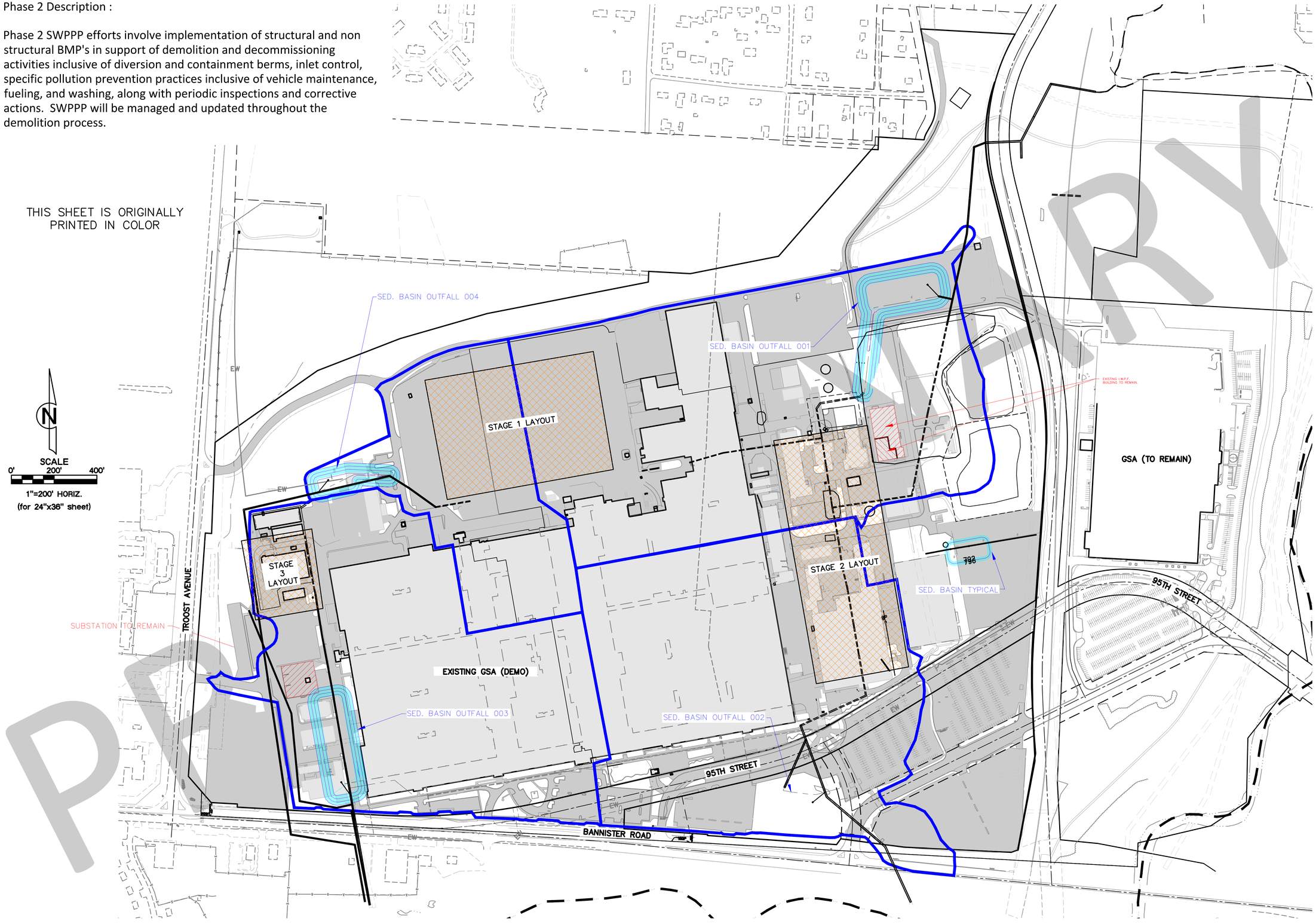
Sheet No.: 15

Location: L:\Projects\13091-01\Plans\construction documents\SWPPP\D11 - 14137.dwg

Phase 2 Description :

Phase 2 SWPPP efforts involve implementation of structural and non structural BMP's in support of demolition and decommissioning activities inclusive of diversion and containment berms, inlet control, specific pollution prevention practices inclusive of vehicle maintenance, fueling, and washing, along with periodic inspections and corrective actions. SWPPP will be managed and updated throughout the demolition process.

THIS SHEET IS ORIGINALLY PRINTED IN COLOR



PRELIMINARY

PHASE 2 GENERAL LAYOUT

BANNISTER FEDERAL COMPLEX
Kansas City, Jackson County, Missouri

DATE	P.E. SIGNATURE	DESCRIPTION

PRELIMINARY

Paul J. Osborne
Civil Engineer
MO#:2001018786

Reviewed By:	P.J.O
Designed By:	J.A.L.
Drafted By:	G.S.
Lutjen Project No.: 14137	

LUTJEN

1301 Burlington, #100
North Kansas City, MO 64116
816.587.4320
816.587.1393 fax
www.lutjen.com

surveying
planning
engineering
landscape architecture

Lutjen, Inc.
MO State Certificate of Authority #: 2007022824

Sheet No.: 16

Location: L:\Projects\13091-01\Plans\construction documents\SWPPP\PH2-General Layout - 14137.dwg

THIS SHEET IS ORIGINALLY
PRINTED IN COLOR

PRELIMINARY

PHASE 2 DEVICES

TEMPORARY DIVERSION BERM

PHASE 2 AREA 001 SITE DIST

BANNISTER FEDERAL COMPLEX
Kansas City, Jackson County, Missouri

DATE	P.E. SIGNATURE	DESCRIPTION

PRELIMINARY

Paul J. Osborne
Civil Engineer
MO#:2001018786

Reviewed By:	P.J.O
Designed By:	J.A.L.
Drafted By:	G.S.
Lutjen Project No.: 14137	

LUTJEN

1301 Burlington, #100
North Kansas City, MO 64116
816.587.4320
816.587.1393 fax
www.lutjen.com

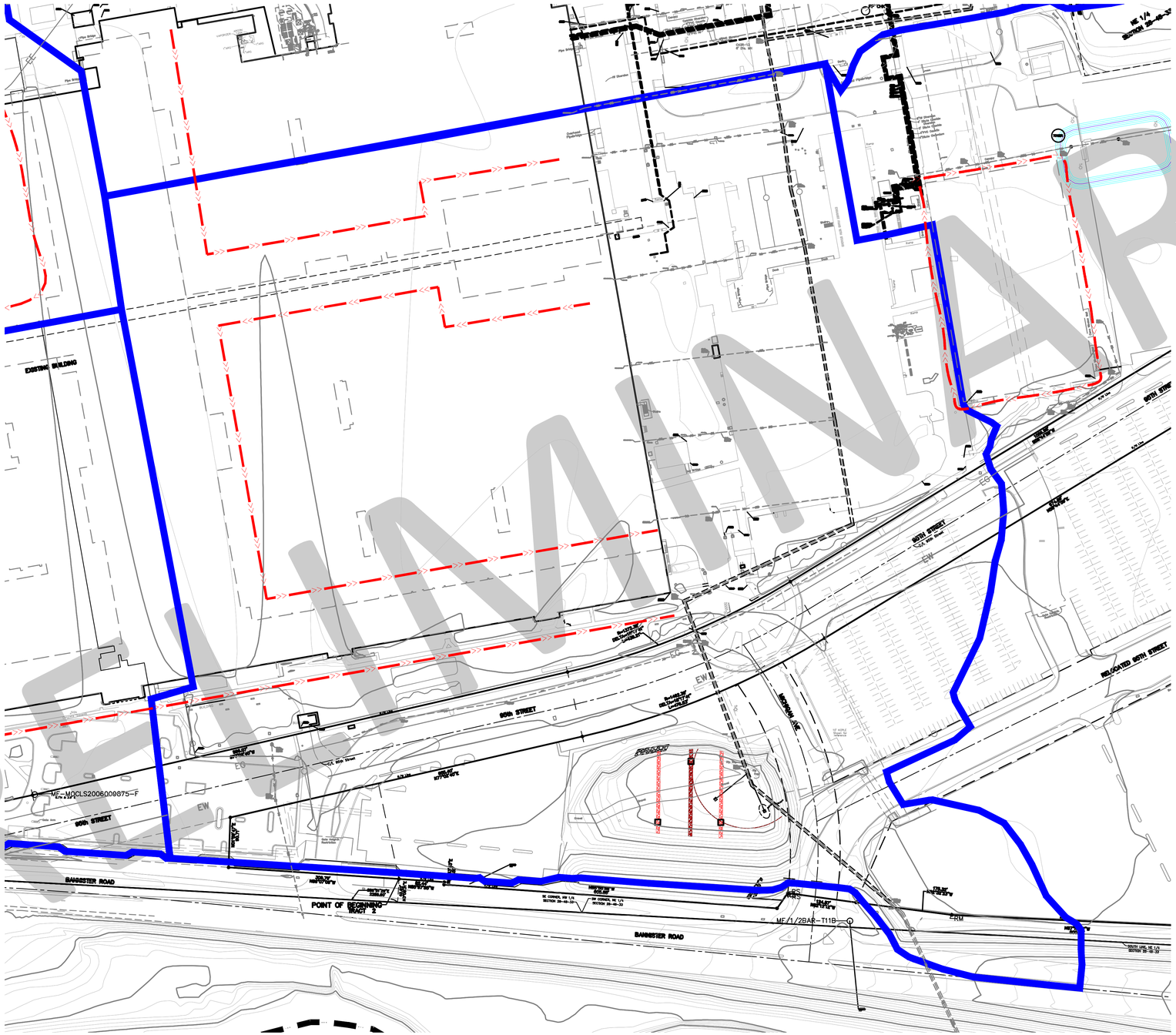
surveying
planning
engineering
landscape architecture

Lutjen, Inc.
MO State Certificate
of Authority #:
2007022824

Sheet No.:
17

Location: L:\Projects\13091-01\Plans\Construction Documents\SWPPP\PH2-AREA 001 SD - 14137.dwg

THIS SHEET IS ORIGINALLY
PRINTED IN COLOR



PHASE 2 DEVICES

TEMPORARY DIVERSION BERM

PRELIMINARY

PHASE 2 AREA 002 SITE DIST

BANNISTER FEDERAL COMPLEX
Kansas City, Jackson County, Missouri

DATE	P.E. SIGNATURE	DESCRIPTION

PRELIMINARY

Paul J. Osborne
Civil Engineer
MO#:2001018788

Reviewed By:	P.J.O
Designed By:	J.A.L.
Drafted By:	G.S.
Lutjen Project No.: 14137	

LUTJEN

1301 Burlington, #100
North Kansas City, MO 64116
816.587.4320
816.587.1393 fax
www.lutjen.com

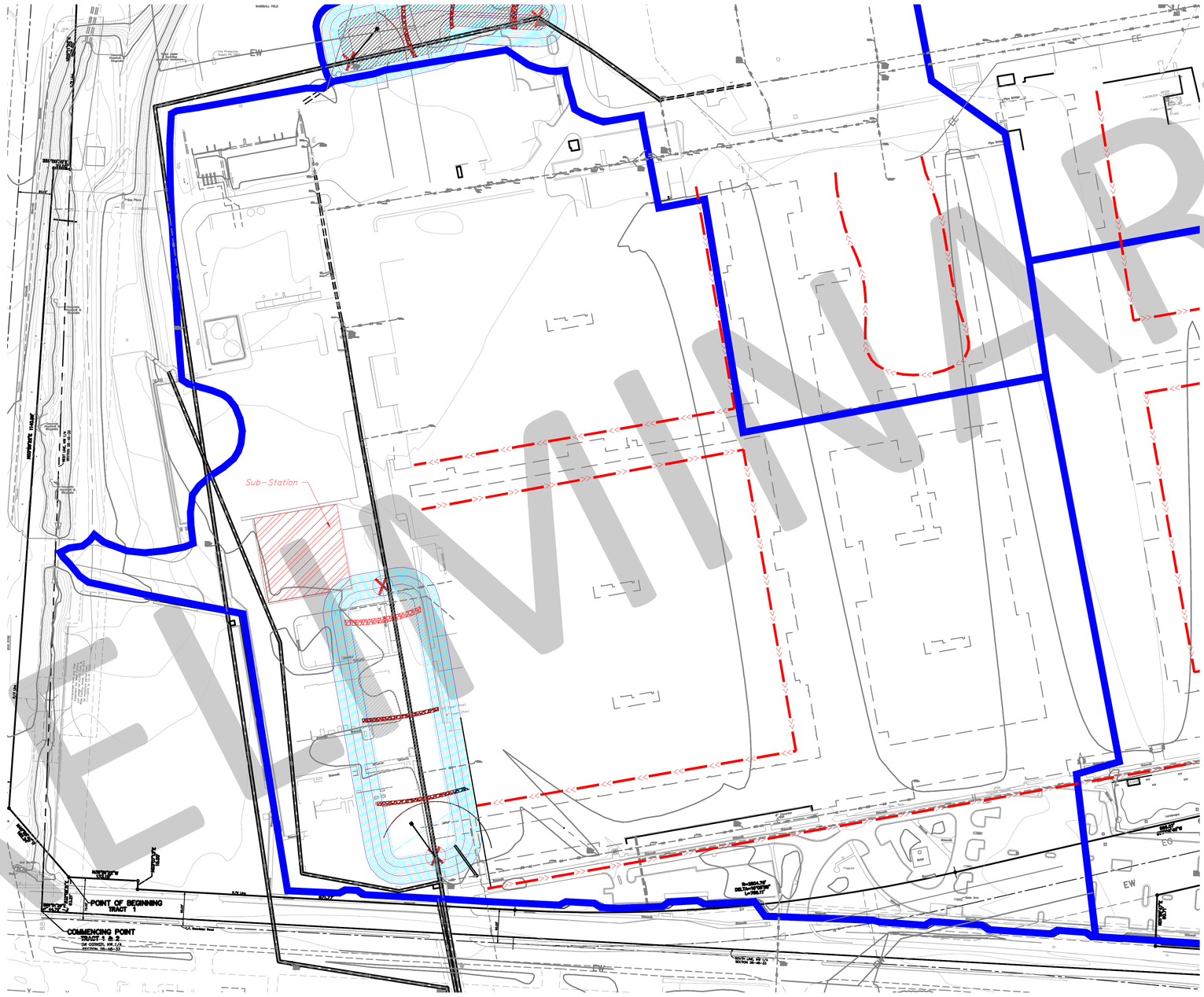
surveying
planning
engineering
landscape architecture

Lutjen, Inc.
MO State Certificate
of Authority #:
2007022824

Sheet No.:
18

Location: L:\Projects\13091-01\Plans\construction documents\SWPPP\PH2-AREA 002 SD - 14137.dwg

THIS SHEET IS ORIGINALLY
PRINTED IN COLOR



N

SCALE
0' 100' 200'
1"=100' HORIZ.
(for 24"x36" sheet)

PHASE 2 DEVICES

TEMPORARY DIVERSION BERM

PHASE 2 AREA 003 SITE DIST

BANNISTER FEDERAL COMPLEX
Kansas City, Jackson County, Missouri

DATE	P.E. SIGNATURE	DESCRIPTION

PRELIMINARY

Paul J. Osborne
Civil Engineer
MO#:2001018786

Reviewed By:	P.J.O
Designed By:	J.A.L.
Drafted By:	G.S.
Lutjen Project No.: 14137	

LUTJEN

1301 Burlington, #100
North Kansas City, MO 64116
816.587.4320
816.587.1393 fax
www.lutjen.com

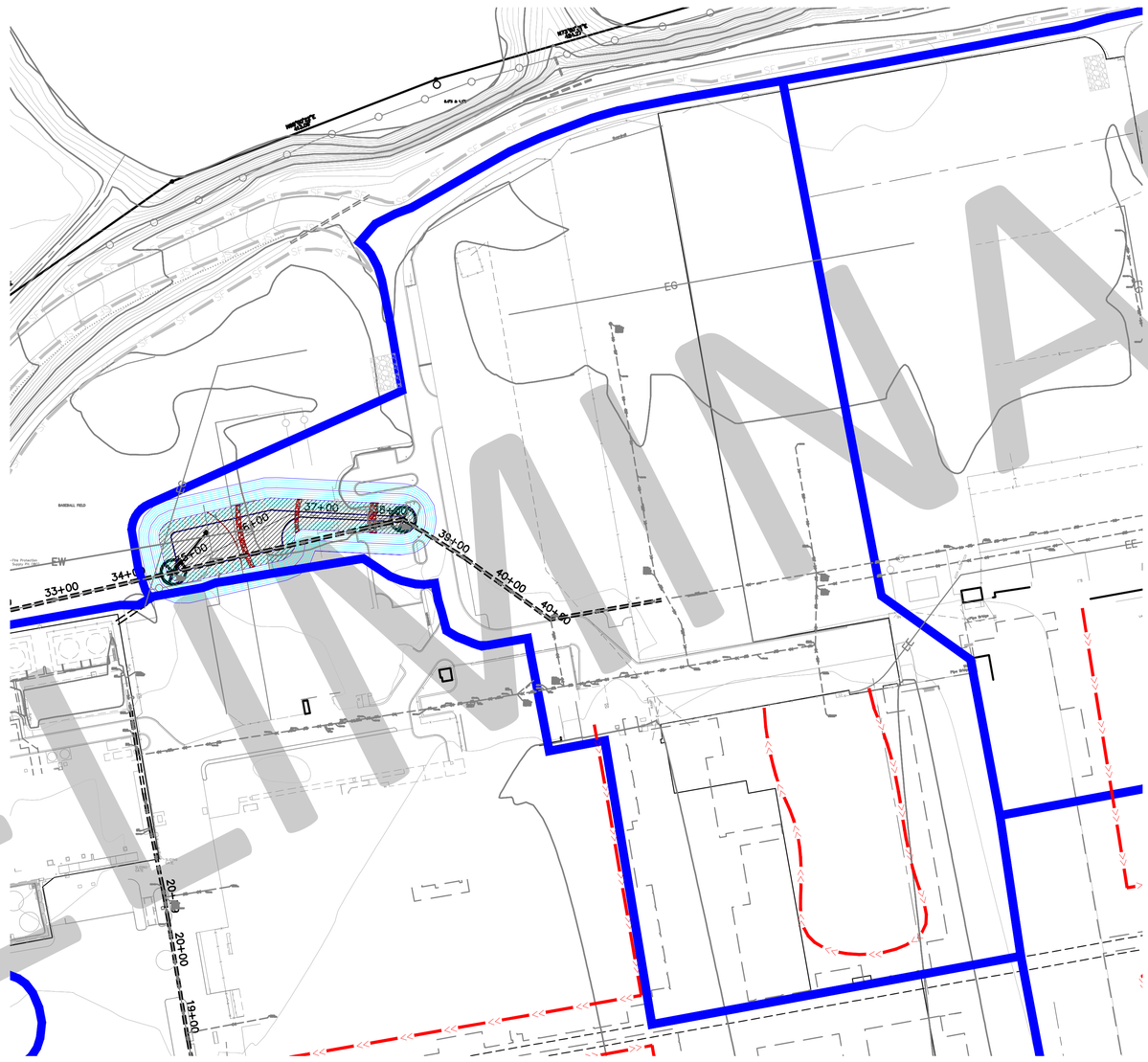
surveying
planning
engineering
landscape architecture

Lutjen, Inc.
MO State Certificate
of Authority #:
2007022824

Sheet No.:
19

Location: L:\Projects\13091-01\Plans\construction documents\SWPPP\PH2-AREA 003 SD - 14137.dwg

THIS SHEET IS ORIGINALLY
PRINTED IN COLOR



N

SCALE
0' 100' 200'
1"=100' HORIZ.
(for 24"x36" sheet)

PHASE 2 DEVICES

TEMPORARY DIVERSION BERM

PRELIMINARY

PHASE 2 AREA 004 SITE DIST

BANNISTER FEDERAL COMPLEX
Kansas City, Jackson County, Missouri

DATE	P.E. SIGNATURE	DESCRIPTION

PRELIMINARY

Paul J. Osborne
Civil Engineer
MO#:2001018786

Reviewed By:	P.J.O
Designed By:	J.A.L.
Drafted By:	G.S.
Lutjen Project No.: 14137	

LUTJEN

1301 Burlington, #100
North Kansas City, MO 64116
816.587.4320
816.587.1393 fax
www.lutjen.com

surveying
planning
engineering
landscape architecture

Lutjen, Inc.
MO State Certificate
of Authority #:
2007022824

Sheet No.:
20

Location: L:\Projects\13091-01\Plans\construction documents\SWPPP\PH2-AREA 004 SD - 14137.dwg

Brandenburg® Industrial Service Company
2625 S. Loomis
Chicago, IL 60608
Phone (312) 326-5800
FAX (312) 326-5055

Brandenburg®

www.Brandenburg.com

SWPPP SEDIMENT POND
WATER TREATMENT SYSTEM
&
SPRUNG STRUCTURE SPECIFICATIONS

Equipment Specifications
PTI Series Multimedia Filter
(24”-60” Diameter)

GENERAL SYSTEM DESCRIPTION

General Description

The multimedia filter is designed and manufactured for industrial filter applications in sizes from 24” to 60” diameter tanks. The units are available in three configurations (Simplex, Duplex, and Triplex) and with four packaged options (Economy, Plus, Deluxe, and Select). Triplex configurations are available on the Plus, Deluxe, and Select packages. Duplex and triplex configurations have multiple modes of operation to maximize operational flexibility.

They are rugged, pre-engineered, pre-assembled units that minimize expensive installation and start-up costs. They require simple utility connections, media loading, and minor configuration for immediate online service. The multimedia filter’s simple design maximizes the efficiency and repeatability of the unit during the service and regeneration modes in order to provide a truly reliable water treatment unit.

Mechanical Description

The multimedia filter consists of steel pressure vessel(s) that contain three grades of filtration media along with 2 support bed layers. The pressure vessels are sandblasted, lined with an NSF approved material, and painted with a durable epoxy coating. The piping and tank internals are constructed of Schedule 80 PVC or Schedule 10, 316L stainless steel. Four structural steel legs, designed to meet International Building Code (IBC) to meet the requirements in 98% of North American installations, support each vessel. Duplex and triplex units are supplied with a structural steel beam frame under the vessel legs and interconnect piping. A relief valve sized for thermal expansion pressure relief is supplied on each tank as a part of the Plus, Deluxe, and Select packages.

Separate source backwash manifold option kits are available for Plus, Deluxe, and Select trim packages. See the Options section for ordering information. Below is a summary of the trim packages and the features associated with each.

Overview					
		Trim Packages			
Item	**Detail**	**Economy**	**Plus**	**Deluxe**	**Select**
Configurations	Simplex	X	X	X	X
	Duplex	X	X	X	X
	Triplex	-	X	X	X
Control		Stager	PLC/HMI	PLC/HMI	PLC/HMI
Vessel	Non - Code	X	X	X	X
	ASME	-	X	X	X
Face Piping	Material	PVC	PVC	316L SS	316L SS
Internals	Upper/Lower	PVC	PVC	PVC	316L SS
Separate Source Backwash		-	Option Kit	Option Kit	Option Kit
Other	Turbidity Sensor	-	Option Kit	Option Kit	X
	DL Sight Glass	-	PVC	PVC	Borosilicate
	PSV (Thermal)	-	X	X	X
	Air Vent	-	Manual	Automatic	Automatic

Electrical Description

Economy
The Multi-Media Filter is controlled by an Aquamatic® 962 series electronic controller. It is combined with an Aquamatic stager (948 or 958) in a NEMA-rated enclosure. The Aquamatic stager is a rotary style valve with multiple ports for directing fluid or air to operate the various valves installed in the multimedia system. This trim package is available in simplex or duplex parallel operation only.

Plus, Deluxe, and Select
The Multi-Media Filter controls are housed in a single NEMA 4 Control Panel mounted on the Simplex, Duplex, or Triplex Filter Skid. All skid wiring (for instrumentation, etc.) and pneumatic tubing (for automated valves) originate from this panel. This single Control Panel will provide control and monitoring for Simplex, Duplex, and Triplex Filter configurations. The Control Panel is provided complete with a programmable logic controller (PLC) and a 7” Color, Touch Screen operator interface (HMI). An Ethernet connection is provided for communication with a SCADA or other control system.

Operational Description

The Multi-Media Filter has the following Modes of Operation and Wash Cycle steps based on the flow configuration and vessel arrangement (Simplex, Duplex, or Triplex configuration):

Simplex (all trim packages)

- Modes of Operation: 3 (Offline, Service, and Wash)
- Wash Cycle Steps: 3 (Backwash, Settle, and Rinse)

Simplex operation consists of one vessel that will run in Service mode. Upon request of a Wash Cycle, the unit will wash accordingly. After completion of the Wash Cycle, the unit will return to Service mode.

Duplex Parallel (all trim packages)

- Modes of Operation: 3 (Offline, Service, and Wash)
- Wash Cycle Steps: 3 (Backwash, Settle, and Rinse)

Duplex Parallel operation consists of two vessels that will both run in Service mode. Upon request of a Wash Cycle, both units will wash consecutively (Unit A, then, Unit B), leaving one unit online at all times.

Duplex Alternating (Plus, Deluxe, and Select trim packages)

- Modes of Operation: 4 (Offline, Standby, Service, and Wash)
- Wash Cycle Steps: 3 (Backwash, Settle, and Rinse)

Duplex Alternating operation consists of two vessels that will run with one in Service mode, and one in Standby mode. Upon request of a Wash Cycle, the vessel in Service mode will wash, while the vessel in Standby mode will enter Service mode.

Duplex Pro-Flo (Plus, Deluxe, and Select trim packages)

- Modes of Operation: 4 (Offline, Standby, Service, and Wash)
- Wash Cycle Steps: 3 (Backwash, Settle, and Rinse)

Duplex Pro-Flo operation consists of two vessels that will run with one in Service mode (Primary vessel), and one in Standby mode (Secondary vessel). When product flow rises above a pre-defined setpoint, the vessel in Standby mode will enter Service mode. This vessel will return to Standby mode when product flow falls below the pre-defined return to standby setpoint. Upon request of a Wash Cycle, all units will wash consecutively. When a vessel is being washed, the remaining vessel will be in Service mode. After completion of the Wash Cycles, the vessel assignment will return to the state they were in prior to the initiation of the Wash Cycle.

Triplex Parallel (Plus, Deluxe, and Select trim packages)

- Modes of Operation: 3 (Offline, Service, and Wash)
- Wash Cycle Steps: 3 (Backwash, Settle, and Rinse)

Triplex Parallel operation consists of three vessels that will all run in Service mode. Upon request of a Wash Cycle, all units will wash consecutively (Unit A, then, Unit B, then, Unit C), leaving two units online at all times

Triplex 2 Online / 1 Standby (Plus, Deluxe, and Select trim packages)

- Modes of Operation: 4 (Offline, Standby, Service, and Wash)
- Wash Cycle Steps: 3 (Backwash, Settle, and Rinse)

Triplex 2 Online / 1 Standby operation consists of three vessels that will run with two in Service mode, and one in Standby mode. Upon request of a Wash Cycle, the vessels in Service mode will wash consecutively. The vessel in Standby will enter Service mode. After completion of the Wash Cycles, the last vessel to be washed will enter Standby mode.

Triplex Pro-Flo (Plus, Deluxe, and Select trim packages)

- Modes of Operation: 4 (Offline, Standby, Service, and Wash)
- Wash Cycle Steps: 3 (Backwash, Settle, and Rinse)

Triplex Pro-Flo operation consists of three vessels that will run with a minimum of one in Service mode, and the others in Standby mode. When product flow rises above a pre-defined setpoint, the vessel in Standby mode will enter Service mode. This vessel will return to Standby mode when product flow falls below the pre-defined return to standby setpoint. Separate setpoints are provided for the 2nd and 3rd vessels. Upon request of a Wash Cycle, all units will wash consecutively (Primary vessel, Secondary vessel, then, Tertiary vessel). When a vessel is being washed, the remaining two vessels will be in Service mode. After completion of the Wash Cycles, the vessel assignment will return to the state they were in prior to the initiation of the Wash Cycle.

SYSTEM DESIGN SPECIFICATIONS

The design specifications for the PTI series multimedia filter are listed in this section.

PRODUCT OFFERING OVERVIEW:

	Economy Product Flow Rates							
	Min. Flow (2 gpm/sqft)		8 gpm/sqft		12 gpm/sqft		15 gpm/sqft	
Model Number	Simplex	Duplex	Simplex	Duplex	Simplex	Duplex	Simplex	Duplex
PTIM 24X48	6.3	13	25	50	38	75	47	94
PTIM 30X60	9.8	20	39	79	59	118	74	147
PTIM 36X60	14	28	57	113	85	170	106	212
PTIM 42X60	19	38	77	154	115	231	144	289
PTIM 48X60	25	50	101	201	151	302	188	377
PTIM 54X72	32	64	127	254	191	382	239	477
PTIM 60X72	39	79	157	314	236	471	295	589

	Plus, Deluxe, and Select Product Flow Rates											
	Min. Flow (2 gpm/sqft)			8 gpm/sqft			12 gpm/sqft			15 gpm/sqft		
Model Number	Simplex	Duplex*	Triplex**	Simplex	Duplex*	Triplex**	Simplex	Duplex*	Triplex**	Simplex	Duplex*	Triplex**
PTIM 24X48	6.3	13	19	25	50	75	38	75	113	47	94	141
PTIM 30X60	9.8	20	29	39	79	118	59	118	177	74	147	221
PTIM 36X60	14	28	42	57	113	170	85	170	254	106	212	318
PTIM 42X60	19	38	58	77	154	231	115	231	346	144	289	433
PTIM 48X60	25	50	75	101	201	302	151	302	452	188	377	565
PTIM 54X72	32	64	95	127	254	382	191	382	573	239	477	716
PTIM 60X72	39	79	118	157	314	471	236	471	707	295	589	884

* While operating in a duplex alternating mode, the product flow rates are the same as a simplex unit.

** While operating in a 2 to 1 mode, the flow rates match a duplex unit. While operating in a progressive flow mode, the minimum flow rate matches the duplex minimum flow.

Nominal Removal Efficiencies:

Service Flux Rate	Anticipated % Particle Removal	
(gpm/sq ft)	Particles > 40 μm	Particles < 40 μm
8	96%	75%
12	80%	60%
15	70%	50%

DESIGN PARAMETERS:

Configuration	Simplex (Economy, Plus, Deluxe, and Select) Duplex (Economy, Plus, Deluxe, and Select) Triplex (Plus, Deluxe, and Select)
Feed Temperature	60°F
Feed Pressure	45 psig
Maximum Inlet Turbidity*	30 NTU (Nephelometric Turbidity Units)
Sizing: Service Flow Rate Backwash Flow Rate Rinse Flow Rate	 8 gpm/ft^2 12 gpm/ft^2 15 gpm/ft^2 15 gpm/ft^2 at 60°F (Economy) Adjustable on Plus, Deluxe, and Select Economy - Service flow Rate Plus, Deluxe, Select - 6 gpm/ft^2
Filter Bed Depth	30"
Freeboard	60% of the media volume (minimum)
Filtration Media	18” depth of anthracite (0.85 to 0.95mm average size) 8” depth of filter sand –quartz #20 (0.45 to 0.55mm average size) 4” depth of garnet #30-40 (0.37mm average size)
Support Bed	3” depth of #8-12 garnet (1.8mm average size) 2" over laterals - ¼" x ⅛" quartz

***** *If process is not within the given limit, then contact applications engineering for assistance.*

OPERATING LIMITS:

Feedwater Temperature: Minimum Maximum	 45°F 95°F for PVC piping systems 120°F for stainless steel piping systems
Feedwater Pressure: Minimum Recommended Maximum Maximum	 45 psig 90 psig max recommended to prevent premature discharge of pressure relief valve on Plus, Deluxe, & Select 100 psig max (Economy)

GENERAL SPECIFICATIONS:

Pressure Vessels

Tank Property	Unit Description	Description
Materials	All	Carbon steel
Rating	All Trim Packages	100 psig non-code
	Plus, Deluxe, Select	100 psig ASME code with stamp
Support:	Simplex - All	Four structural steel legs, Seismic IBC*
	Duplex - All	Four structural steel legs and two structure steel beams (skid), all Seismic IBC*
	Triplex / Plus, Deluxe, Select	Four structural steel legs and two structure steel beams (skid), all Seismic IBC*
Access Openings:	24”-30” dia.	Two 4" by 6" hand holes (top and side)
	36” dia.	One 4" by 6" hand hole and one 12" by 16" crab style
	42” – 60” dia.	One 12" by 16" crab style
Process Connections	All except vent	Carbon steel pad flanges
	Vent	316L stainless steel FPT
Paint	All	4 to 6 mils DFT epoxy
Lining	All	8 - 16 mil DFT epoxy nominal (NSF-61 Approved)

* See Regulations and Standards for detailed seismic information.

Distribution Systems

Distributor	Unit Description	Description
Upper	Economy, Plus, Deluxe	Schedule 80 PVC Single point distributor
	Select	Schedule 10 316L stainless steel Single point distributor
Lower (under drain)	Economy, Plus, & Deluxe	Schedule 80 PVC hub and radial
	Select	316L stainless steel hub and radial

Piping Systems

Piping	Unit Description	Description
Face Piping	Economy, Plus	Schedule 80 PVC socket welded, flanged, threaded, and grooved connections (NSF Approved Fittings and Pipe)
	Deluxe, Select	316L stainless steel flanged, threaded, and grooved connections
Separate Source Backwash Option Header Kit	Plus, Deluxe and Select - Duplex/ Triplex Units	Plus - Schedule 80 PVC socket welded, flanged (NSF Approved Fittings and Pipe) Deluxe – 316L Stainless Steel, butt-welded, flanged

GENERAL SPECIFICATIONS (continued):

Process Valves

Package	Size	Description
Economy	3" and smaller	AquaMatic V52 series, Noryl™, angle pattern globe
	Actuator	Line pressure to open, hydraulic pressure to close
	4" and larger	Bray, cast iron butterfly with EPDM seats and stainless steel disk
	Actuator	Air to Close / Spring Open
Plus, Deluxe, Select	1" and larger	Air Vent – Plus: GF Series 546 PVC manual ball valve Deluxe and Select: Flow-Tek 316SS ball valve with RPTFE seat and PTFE seals (Manual on Plus, Automated on Deluxe and Select) Process - Bray, cast iron butterfly with EPDM seats and stainless steel disk (wafer design 1" through 1.5", lug design for 2" and larger). Service, backwash, and drain outlet valves have adjustable travel stops to set flows.
	Actuation	Air to Open / Spring to Close

Sample Valves

Valve	Unit Description	Description
Inlet Sample	Economy, Plus	One ¼" PVC ball valve
	Deluxe, Select	One ¼" 316 SS plug valve
Product & Drain Sample	Economy, Plus	One ¼" PVC ball valve
	Deluxe, Select	One ¼" 316 SS plug valve

INSTRUMENTATION SPECIFICATIONS:

Instrument	Unit Description	Description
Pressure Gauges	All	316 SS, 63mm dial, FDA approved glycerin filled, ¼" NPT
Pressure Differential Switch	All	316ss process connection and diaphragm, ¼" NPT
Flow Sensors	Economy	Product - Signet 2536 paddlewheel
	Plus, Del, & Sel	Product & Drain - Signet 2536 paddlewheel
Turbidity Meter	Plus, Deluxe	Optional (See Options Section) Hach 1720E
	Select	Included – Hach 1720E

CONTROLS SPECIFICATIONS FOR TIMECLOCK CONTROLLER PACKAGE (ECONOMY MODEL):

Timeclock Controller	AquaMatic 948 simplex or 958 duplex with a 962 controller
Timeclock Enclosure	NEMA 4X fiberglass

CONTROLS SPECIFICATIONS FOR PLC PACKAGES (PLUS, DELUXE AND SELECT MODELS):

Main control panel	Carbon steel enclosure, frame mounted, NEMA 4, ANSI 61 gray
Programmable Logic Controller (PLC)	Siemens S7/1215C, model 6ES7 215-1BG31-0XB0 w/ Ethernet OR Allen-Bradley Micrologix 1100, model 1763-L16BWA w/Ethernet
PLC input/output	Discrete 24 point (14 input and 10 output) (Expandable) Analog 2 input and 1 output (Expandable) Discrete 8 point output module(s) for larger configurations
HMI – 7 Inch Color Touch Screen	Siemens TP700 Comfort Panel, model 6AV2124-0GC01-0AX0 with Ethernet OR Allen-Bradley PV+ 700, model 2711P-T7C4D8 with Ethernet
Shutdown alarms	Emergency Stop Pushbutton Activated
HMI status indicator/value	All alarms (popup alarm banner) Product flow, drain flow, turbidity Process inlet, process outlet, backwash outlet, backwash inlet, rinse outlet valve status Multimedia filter status
HMI Switches / Pushbuttons	Manual control for all valves Filter offline / online select Wash cycle method select Manual wash cycle initiate Wash cycle step advance Wash cycle step hold Differential pressure high – wash cycle start delay Totalized product flow reset Alarm silence Alarm reset Remote Control Enable/Disable
Miscellaneous controls	Alarm horn and alarm pilot light Auxiliary contacts for fault

INTERFACE COMMUNICATION SPECIFICATIONS:

Filter in wash cycle	Activation of this signal confirms that the multimedia filter is in a wash cycle. (Dry contacts)
Fault	Activation of this signal confirms that the multimedia filter is in a fault condition. (Dry contacts)
Backwash Pump (not included)	Activation of this signal confirms that the multimedia filter is in backwash step of a wash cycle. (Dry contacts)

REGULATIONS & STANDARDS:

Pressure Vessel Codes	None *Optional:* ASME Section VIII
Surface Preparation	SSPC SP-10 for vessel interior SSPC SP-6 for external steel surfaces
Electrical	NEMA 4 (IP 65)
Seismic Rating	IBC (2006) S_1 = 1.1 S_S = 2.5 Seismic Use = Group I Seismic Design Category = E Site Class = B Response Modification Factor = 3 Concrete = 3000 psi minimum ultimate 28 day strength.
Piping	Hydrotested to 100 psig

DOCUMENTATION PACKAGE:

Documents	Storage, installation and operating instructions
Drawings	Process & Instrumentation Diagram (P&ID), General Arrangement (GA) and Electrical Schematic (Plus, Deluxe, and Select)
Quality Documents	None *Optional:* U-1A form with ASME Code vessels

PRESSURE DROP SPECIFICATIONS:

All pressure drops are based on a simplex unit with a clean bed. Pressure drop includes all loses from the inlet flange to the outlet flange on the face piping. Interconnect piping on duplex and triplex systems are not included in these calculations. All values are approximate, based on sch80 PVC, and 77°F water.

ECONOMY

		Flow (gpm) / Pressure Drop (psi)						
	Config*	**24 x 48**	**30 x 60**	**36 x 60**	**42 x 60**	**48 x 60**	**54 x 72**	**60 x 72**
15 gpm/sqft	S	47 / 18	74 / 14	106 / 13	144 / 21	188 / 15	239 / 21	295 / 10
12 gpm/sqft	S	38 / 14	59 / 11	85 / 10	115 / 16	151 / 12	191 / 17	236 / 8
8 gpm/sqft	S	25 / 8	39 / 6	57 / 6	77 / 9	101 / 7	127 / 9	157 / 5

* S is simplex. For Duplex systems, the flow rate doubles, but the pressure drop across the unit remains the same.

PLUS, DELUXE, & SELECT

		Flow (gpm) / Pressure Drop (psi)						
	Config*	**24 x 48**	**30 x 60**	**36 x 60**	**42 x 60**	**48 x 60**	**54 x 72**	**60 x 72**
15 gpm/sqft	S	47 / 11.2	74 / 11.4	106 / 8	144 / 9.3	188 / 11.1	239 / 9.1	295 / 10.1
12 gpm/sqft	S	38 / 9.1	59 / 9.2	85 / 6.9	115 / 7.6	151 / 9	191 / 7.6	236 / 8.5
8 gpm/sqft	S	25 / 6.8	39 / 6.9	57 / 5.9	77 / 6.2	101 / 6.8	127 / 6.2	157 / 6.6

* S is simplex. For Duplex systems, the flow rate doubles and for Triplex, the flow rate triples, but the pressure drop across the unit remains the same.

MEDIA SPECIFICATIONS:

ECONOMY

	Config*	Media Quantities (ft.^{3} / lbs.)						
		24 x 48	**30 x 60**	**36 x 60**	**42 x 60**	**48 x 60**	**54 x 72**	**60 x 72**
Anthracite	S	4.7/254	7.4/400	10.6/572	14.4/778	18.8/1,015	23.9/1,291	29.5/1,534
Sand	S	2.1/210	3.3/330	4.7/470	6.4/640	8.4/840	10.6/1,060	13.1/1,310
Garnet	S	1.0/125	1.6/200	2.4/300	3.3/413	4.2/525	5.3/663	6.5/813
#8-12 Garnet	S	0.8/112	0.8/112	1.2/168	2.4/336	3.1/434	4.0/560	4.9/686
¼" by ⅛" Quartz	S	1.5/150	2.8/280	4.2/420	6.2/620	9.2/920	13.0/1,300	17.1/1,710

* S is simplex. For Duplex systems, double the media quantities and for Triplex, triple the media quantities.

PLUS, DELUXE, & SELECT

	Config*	Media Quantities (ft.^{3} / lbs.)						
		24 x 48	**30 x 60**	**36 x 60**	**42 x 60**	**48 x 60**	**54 x 72**	**60 x 72**
Anthracite	S	4.7/254	7.4/400	10.6/572	14.4/778	18.8/1015	23.9/1291	29.5/1593
Sand	S	2.1/210	3.3/330	4.7/470	6.4/640	8.4/840	10.6/1060	13.1/1310
Garnet	S	1/125	1.6/200	2.4/300	3.3/413	4.2/525	5.3/663	6.5/813
#8-12 Garnet	S	0.8/112	0.8/112	1.2/168	2.4/336	3.1/434	4/560	4.9/686
¼" by ⅛" Quartz	S	2/200	3/300	4/400	6/600	8/800	11/1100	14/1400

* S is simplex. For Duplex systems, double the media quantities and for Triplex, triple the media quantities.

REGENERATION SEQUENCE, TIMES, AND FLOW RATE:

ECONOMY

Regeneration Step	Time (minutes)
Backwash	15
Settle	2
Rinse	10
Total Time	27

STEP	Flow Rate (gpm)						
	24 x 48	**30 x 60**	**36 x 60**	**42 x 60**	**48 x 60**	**54 x 72**	**60 x 72**
BACKWASH	47	74	106	144	188	239	295
RINSE	SERVICE FLOW RATE						

REGENERATION SEQUENCE, TIMES, AND FLOW RATE (continued):

PLUS, DELUXE, & SELECT

			Flow Rate (gpm)					
Step	**Series (Dia-Side Sht)**	**Std. Duration (min)**	**<40°F**	**40°F to 50°F**	**50°F to 60°F**	**60°F to 70°F**	**70°F to 80°F**	**80°F to 90°F**
BACKWASH*	24X48	15	31	38	44	47	57	66
	30X60		49	59	69	74	88	103
	36X60		71	85	99	106	127	148
	42X60		96	115	135	144	173	202
	48X60		126	151	176	188	226	264
	54X72		159	191	223	239	286	334
	60X72		196	236	275	295	353	412
Settle	All models	2	Not Applicable					
RINSE	24X48	10	19					
	30X60		29					
	36X60		42					
	42X60		58					
	48X60		75					
	54X72		95					
	60X72		118					

* Outlet Valve is provided with an adjustable travel stopped valve to be field set based on water temperature.

CUSTOMER CONNECTION SPECIFICATIONS:

All connections are class 150 flanges or equivalent unless otherwise noted.

ECONOMY

	Config	24 x 48	30 x 60	36 x 60	42 x 60	48 x 60	54 x 72	60 x 72
Service Inlet / Outlet	S	1-1/2"	2"	2-1/2"	2-1/2"	3"	3"	4"
	D	2”	2-1/2”	3”	4”	4”	6”	6”
Drain	S	2"	2"	3"	3"	4"	4"	6"
	D	2-1/2"	2-1/2"	4”	4”	6”	6”	6”

PLUS

	Config	24 x 48	30 x 60	36 x 60	42 x 60	48 x 60	54 x 72	60 x 72
Service Inlet & Outlet	S	1-1/2"	2”	3”	3”	3”	4”	4”
	D	2”	3”	3”	4”	4”	6”	6”
	T	3”	3”	4”	4”	6”	6”	8”
Drain	All	1-1/2"	2”	3”	3”	3”	4”	4”
PSV Outlet	All	1-1/4” FPT						
Vent Outlet	All	1”						

DELUXE AND SELECT

	Config	24 x 48	30 x 60	36 x 60	42 x 60	48 x 60	54 x 72	60 x 72
Service Inlet / Outlet	S	1-1/2"	2”	2”	3”	3”	3”	4”
	D	1-1/2"	2”	3”	3”	3”	4”	4”
	T	2”	3”	4”	4”	4”	6”	6”
Drain	All	1-1/2"	2”	2”	3”	3”	3”	4”
PSV Outlet	All	1-1/4” FPT						
Vent Outlet	All	1”						

UTILITY REQUIREMENTS:

Vessel Size (inches)	24 x 48	30 x 60	36 x 60	42 x 60	48 x 60	54 x 72	60 x 72
Ambient air limitation	100ºF maximum for all trim packages						
Electrical service	120 VAC/1 Phase/60 Hz/10 Full Load Amps						
Feedwater pressure range	All - 45 psig minimum Economy - 100 psig maximum Plus, Deluxe, and Select - 90 psig maximum recommended to prevent premature discharge of pressure relief valve						
Air (Plus, Deluxe, Select, and 60” Economy)	2 scfm @ 80 – 100 psig clean, oil-free, dry air						
Drain requirements	Floor & waste drains for general maintenance purposes						
Maximum Drainage (gpm)*	66	103	148	202	264	334	412

* Based on worst case backwash flow at elevated temperature.

PHYSICAL DIMENSION SPECIFICATIONS:

NOTE: *Dimensions do not include operating space requirements. All weights are approximate and are based on the heaviest options.*

MMF ECONOMY MODELS

	Config	LENGTH (in / mm)	WIDTH (in / mm)	HEIGHT (in / mm)	SHIPPING WEIGHT* (lbs / kg)	OPERATING WEIGHT (lbs / kg)
24x48	S	41 / 1041	41 / 1041	76 / 1930	584 / 266	1494 / 680
	D	97 / 2464	41 / 1041	80 / 2032	989 / 450	2809 / 1277
30x60	S	47 / 1194	51 / 1295	90 / 2286	741 / 337	2511 / 1142
	D	97 / 2464	51 / 1295	94 / 2388	1479 / 672	5018 / 2281
36x60	S	51 / 1295	57 / 1448	96 / 2438	1057 / 481	3603 / 1638
	D	97 / 2464	57 / 1448	100 / 2540	1948 / 885	7039 / 3199
42x60	S	55 / 1397	63 / 1600	100 / 2540	1284 / 584	4740 / 2155
	D	133 / 3378	63 / 1600	104 / 2642	2448 / 1113	9359 / 4254
48x60	S	62 / 1575	76 / 1930	106 / 2692	1528 / 694	6043 / 2747
	D	133 / 3378	76 / 1930	110 / 2794	2913 / 1324	11943 / 5429
54x72	S	65 / 1651	82 / 2083	121 / 3073	1918 / 872	8778 / 3991
	D	158 / 4013	82 / 2083	123 / 3124	3795 / 1725	17516 / 7962
60x72	S	64 / 1626	79 / 2007	125 / 3175	2369 / 1077	10840 / 4928
	D	158 / 4013	97 / 2464	127 / 3226	4699 / 2136	21640 / 9837

* Dry unit without media

MMF PLUS MODELS

	Config	LENGTH (in / mm)	WIDTH (in / mm)	HEIGHT (in / mm)	SHIP HT. (in / mm)	SHIPPING WEIGHT* (lbs / kg)	OPERATING WEIGHT (lbs / kg)
24x48	S	40 / 1016	53 / 1346	91 / 2311	76 / 1930	615 / 280	1844 / 839
	D	69 / 1753	53 / 1346	95 / 2413	80 / 2032	1041 / 473	3498 / 1590
	T	97 / 2464	57 / 1448	95 / 2413	80 / 2032	1468 / 667	5153 / 2342
30x60	S	44 / 1118	57 / 1448	108 / 2743	93 / 2362	780 / 355	3169 / 1441
	D	88 / 2235	64 / 1626	112 / 2845	97 / 2464	1557 / 708	6334 / 2880
	T	128 / 3251	68 / 1727	112 / 2845	97 / 2464	2224 / 1011	9390 / 4268
36x60	S	51 / 1295	69 / 1753	110 / 2794	95 / 2413	1113 / 506	4550 / 2068
	D	91 / 2311	74 / 1880	115 / 2921	100 / 2540	2050 / 932	8923 / 4056
	T	131 / 3327	77 / 1956	115 / 2921	100 / 2540	2977 / 1353	13286 / 6039
42x60	S	59 / 1499	76 / 1930	117 / 2972	102 / 2591	1352 / 615	6017 / 2736
	D	110 / 2794	82 / 2083	121 / 3073	106 / 2692	2577 / 1171	11906 / 5412
	T	162 / 4115	82 / 2083	121 / 3073	106 / 2692	3668 / 1667	14033 / 6379
48x60	S	62 / 1575	85 / 2159	121 / 3073	106 / 2692	1608 / 731	7704 / 3502
	D	115 / 2921	86 / 2184	125 / 3175	110 / 2794	3066 / 1394	15257 / 6935
	T	169 / 4293	91 / 2311	125 / 3175	110 / 2794	4572 / 2078	22858 / 10390
54x72	S	68 / 1727	90 / 2286	137 / 3480	122 / 3099	2019 / 918	11280 / 5128
	D	134 / 3404	98 / 2489	143 / 3632	128 / 3251	3995 / 1816	22517 / 10235
	T	198 / 5029	98 / 2489	143 / 3632	128 / 3251	5887 / 2676	33670 / 15305
60x72	S	74 / 1880	96 / 2438	140 / 3556	125 / 3175	2494 / 1134	13930 / 6332
	D	140 / 3556	104 / 2642	146 / 3708	131 / 3327	4946 / 2248	27817 / 12644
	T	204 / 5182	104 / 2642	146 / 3708	131 / 3327	7310 / 3323	41616 / 18917

** Dry unit without media

PHYSICAL DIMENSION SPECIFICATIONS (continued):

MMF DELUXE & SELECT MODELS**

	Config	LENGTH (in / mm)	WIDTH (in / mm)	HEIGHT (in / mm)	SHIP HT. (in / mm)	SHIPPING WEIGHT*** (lbs / kg)	OPERATING WEIGHT (lbs / kg)
24x48	S	41 / 1041	49 / 1245	91 / 2311	76 / 1930	748 / 340	1977 / 899
	D	70 / 1778	49 / 1245	95 / 2413	80 / 2032	1184 / 538	3641 / 1655
	T	98 / 2489	49 / 1245	95 / 2413	80 / 2032	2882 / 1310	6567 / 2985
30x60	S	46 / 1168	59 / 1499	108 / 2743	93 / 2362	1071 / 487	3460 / 1573
	D	89 / 2261	59 / 1499	112 / 2845	97 / 2464	1964 / 893	6741 / 3065
	T	129 / 3277	61 / 1549	112 / 2845	97 / 2464	2620 / 1191	9786 / 4448
36x60	S	50 / 1270	61 / 1549	110 / 2794	95 / 2413	1247 / 567	4684 / 2129
	D	92 / 2337	65 / 1651	115 / 2921	100 / 2540	2358 / 1072	9231 / 4196
	T	132 / 3353	67 / 1702	115 / 2921	100 / 2540	3525 / 1602	13834 / 6288
42x60	S	60 / 1524	76 / 1930	117 / 2972	102 / 2591	1634 / 743	6299 / 2864
	D	114 / 2896	76 / 1930	121 / 3073	106 / 2692	3165 / 1439	12494 / 5680
	T	166 / 4216	76 / 1930	121 / 3073	106 / 2692	4755 / 2161	18748 / 8522
48x60	S	65 / 1651	82 / 2083	121 / 3073	106 / 2692	1931 / 878	8027 / 3649
	D	117 / 2972	82 / 2083	125 / 3175	110 / 2794	3692 / 1678	15883 / 7219
	T	169 / 4293	83 / 2108	125 / 3175	110 / 2794	5477 / 2490	23763 / 10802
54x72	S	70 / 1778	88 / 2235	137 / 3480	122 / 3099	2254 / 1025	11515 / 5235
	D	137 / 3480	90 / 2286	143 / 3632	128 / 3251	4431 / 2014	22953 / 10433
	T	202 / 5131	92 / 2337	143 / 3632	128 / 3251	6639 / 3018	34422 / 15647
60x72	S	69 / 1753	99 / 2515	140 / 3556	125 / 3175	2875 / 1307	14311 / 6505
	D	140 / 3556	99 / 2515	146 / 3708	131 / 3327	5691 / 2587	28562 / 12983
	T	207 / 5258	100 / 2540	146 / 3708	131 / 3327	8574 / 3897	42880 / 19491

** Weights are approximated for the heaviest unit with all options.
*** Dry unit without media

ORDERING INFORMATION MATRIX

Vantage® PreTreatment - Industrial (PTI) Multimedia Filter

Sample Part Number: PTIM D S N 60X72 A

PTIM
- Vantage® PTI MMF

TRIM PACKAGE
- E — ECONOMY - (PVC piping, Stager)
- P — PLUS - (PVC piping, PLC/HMI)
- D — DELUXE - (316L SS piping, PVC Internals, PLC/HMI)
- S — SELECT - (316L SS piping & internal dist, PLC HMI)

SYSTEM CONFIGURATION
- S — SIMPLEX
- D — DUPLEX
- T — TRIPLEX (Plus, Deluxe, and Select Only)

VESSEL CODE
- N — NON-CODE
- A — ASME Section VIII Div 1 (Plus, Deluxe, and Select Only)

VESSEL (Diameter x Shell Height)
- 24X48 — 24" Dia X 48" Side Sheet
- 30X60 — 30" Dia X 60" Side Sheet
- 36X60 — 36" Dia X 60" Side Sheet
- 42X60 — 42" Dia X 60" Side Sheet
- 48X60 — 48" Dia X 60" Side Sheet
- 54X72 — 54" Dia X 72" Side Sheet
- 60X72 — 60" Dia X 72" Side Sheet

Controls
- E — Electro-Mechanical Controller (Economy Only)
- A — Allen-Bradley Controls (Plus, Deluxe and Select Only)
- S — Siemens Controls (Plus, Deluxe and Select Only)

OPTION KITS (Separate PO line Items)

INSTRUMENTATION – 1 per system.

Option	Option Kit #	Description
Turbidity Monitor	W3T81530	Hach 1720E Option kit for Plus and Deluxe Trim Packages

SEPARATE SOURCE BACKWASH MANIFOLD KIT – 1 per system.

Part Number	Description	Material	Configuration	Tank Size
W3T82494	KIT, PTI SSBW 24” DPLX 316SS	316 SS	Duplex	24”
W3T82495	KIT, PTI SSBW 30” DPLX 316SS	316 SS	Duplex	30”
W3T82496	KIT, PTI SSBW 36” DPLX 316SS	316 SS	Duplex	36”
W3T82497	KIT, PTI SSBW 42” DPLX 316SS	316 SS	Duplex	42”
W3T82498	KIT, PTI SSBW 48” DPLX 316SS	316 SS	Duplex	48”
W3T82499	KIT, PTI SSBW 54” DPLX 316SS	316 SS	Duplex	54”
W3T82500	KIT, PTI SSBW 60” DPLX 316SS	316 SS	Duplex	60”
W3T82501	KIT, PTI SSBW 24” TPLX 316SS	316 SS	Triplex	24”
W3T82502	KIT, PTI SSBW 30” TPLX 316SS	316 SS	Triplex	30”
W3T82503	KIT, PTI SSBW 36” TPLX 316SS	316 SS	Triplex	36”
W3T82504	KIT, PTI SSBW 42” TPLX 316SS	316 SS	Triplex	42”
W3T82505	KIT, PTI SSBW 48” TPLX 316SS	316 SS	Triplex	48”
W3T82506	KIT, PTI SSBW 54” TPLX 316SS	316 SS	Triplex	54”
W3T82507	KIT, PTI SSBW 60” TPLX 316SS	316 SS	Triplex	60”
W3T82451	KIT, PTI SSBW 24” DPLX PVC	Sch 80 PVC *	Duplex	24”
W3T82452	KIT, PTI SSBW 30” DPLX PVC	Sch 80 PVC *	Duplex	30”
W3T82453	KIT, PTI SSBW 36” DPLX PVC	Sch 80 PVC *	Duplex	36”
W3T82454	KIT, PTI SSBW 42” DPLX PVC	Sch 80 PVC *	Duplex	42”
W3T82455	KIT, PTI SSBW 48” DPLX PVC	Sch 80 PVC *	Duplex	48”
W3T82456	KIT, PTI SSBW 54” DPLX PVC	Sch 80 PVC *	Duplex	54”
W3T82457	KIT, PTI SSBW 60” DPLX PVC	Sch 80 PVC *	Duplex	60”
W3T82458	KIT, PTI SSBW 24” TPLX PVC	Sch 80 PVC *	Triplex	24”
W3T82459	KIT, PTI SSBW 30” TPLX PVC	Sch 80 PVC *	Triplex	30”
W3T82460	KIT, PTI SSBW 36” TPLX PVC	Sch 80 PVC *	Triplex	36”
W3T82461	KIT, PTI SSBW 42” TPLX PVC	Sch 80 PVC *	Triplex	42”
W3T82462	KIT, PTI SSBW 48” TPLX PVC	Sch 80 PVC *	Triplex	48”
W3T82463	KIT, PTI SSBW 54” TPLX PVC	Sch 80 PVC *	Triplex	54”
W3T82464	KIT, PTI SSBW 60” TPLX PVC	Sch 80 PVC *	Triplex	60”

* Available at time of order only.

BF 400
Up to 400 GPM

Features

- Manifold connections are 6" 150 lb flanges
- Quadruple bag filter
- Bag filter for high solids holding capacity
- Replaceable bag filters from 100 to 1 micron nominal rating
- No moving parts
- Skid mounted

Technical

- Bag filter chambers connect in parallel
- Units are fitted with bleed valves and pressure gauges
- System can stand alone for sediment removal or be used in combination with filter equipment
- Footprint: 62" long x 36" wide x 61" high
- Dry weight: 1,150 lbs.

Material Specifications

- Chambers constructed of 304 Stainless Steel
- Piping constructed of 304 stainless steel
- Each bag filter chamber holds one (1) 7" x 30" double- stitched filter bag
- Maximum operating pressure: 125psi
- Stainless Steel inlet and outlet manifolds

HP® SERIES LIQUID PHASE ADSORPTION SYSTEMS (ASME CODE)

Applications

The HP® Series Adsorption Systems are designed to remove dissolved organic contaminants from water. These systems are cost effectively used in applications including:

- Groundwater remediation
- Wastewater filtration
- Tank rinse water treatment
- Pilot testing
- Underground storage tank clean up
- Leachate treatment
- Dechlorination
- Spill cleanup
- Food grade
- Drinking water

Installation, Startup and Operation

The HP 810, HP 1020 and HP 1220 systems are shipped as separate components—two adsorbers and a piping skid module. The piping module allows the adsorbers to operate in series or parallel configurations. The systems requires minimal field assembly and site connections.

Evoqua can provide a total service package that includes utilizing OSHA trained personnel providing on-site carbon changeouts, packaging and transportation of spent carbon for recycling at our RCRA permitted reactivation facilities, where the contaminants are thermally destroyed.

We can provide instructions on sampling the spent carbon and completion of our spent carbon profile form. Spent carbon acceptance testing can be performed at our certified laboratory. When requested, a certificate of reactivation will be issued.

FEATURES AND BENEFITS

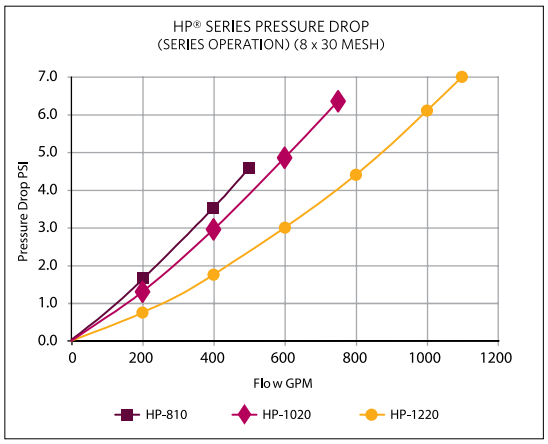
- ASME code section VIII (stamped), carbon steel vessel
- SSPC-SP5 surface preparation, NSF approved Plasite vinyl ester lining; rust preventative epoxy/urethane exterior
- Uniform, continuous internal lining flange to flange (HP 1020/1220 Systems)
- Proprietary vertical 316 stainless steel externally removable septa nozzles (HP 1020/1220 Systems) allows maintenance of underdrain without vessel entry
- Modular design for easy handling and installation
- Internal spray nozzle ensures complete removal of all spent carbon
- Schedule 40 carbon steel pipe, supplied with cast iron gear/wheel operated butterfly valves with EPDM seats
- Carbon slurry piping made from schedule 40 carbon steel
- In-bed water sample collection ports —25 - 50 - 75% bed depths
- Top and side manway allows for easy internal inspection

SPECIFICATIONS/TYPICAL PROPERTIES

	HP® 810SYS	HP® 1020SYS	HP® 1220SYS
Dimensions (each adsorber - dia. x sidewall height)	96″ x 84″	120″ x 96″	144″ x 60″
Overall Height	15′ 2″	18′ 2″	16′ 4″
System Length	22′ 8″	26′ 10″	28′ 10″
System Width	10′	11′ 3″	13′ 2″
Process Piping	6″	8″	8″
Flanged Inlet/Outlet (150# ANSI)	6″	8″	8″
Carbon Fill/Discharge	4″	4″	4″
Flanged Backwash/Vent	6″	8″	8″
Manway (dia., side shell location)	20″	20″	20″
Manway (top)	14″ x 18″	14″ x 18″	14″ x 18″
Utility Water/Air (hose connection)①	2″	2″	2″
Interior Coating	Vinyl Ester	Vinyl Ester	Vinyl Ester
Exterior Coating	Urethane	Urethane	Urethane
Empty System Weight (lbs.)	15,500	34,000	35,000
Carbon Weight/Vessel (lbs.) ②	10,000	20,000	20,000
Operating Weight (lbs.)	85,000	138,000	155,000
Design Pressure (PSIG) @ 140°F	125	125	125
Max. Flow (GPM) Series/Parallel	500/1,000	750/1,500	1,100/2,200
Backwash Rate (GPM) (8 x 30 mesh @ 55°F)	450	710	1,000

① Kamlock type
For detailed specifications or dimensional information or drawings, contact your local Evoqua sales representative.

② Weight of carbon based on density of 29.5 lb./ft3. Loaded weight can vary depending on actual density of GAC.



Safety Note: Wet activated carbon readily adsorbs atmospheric oxygen. Dangerously low oxygen levels may exist in closed vessels or poorly ventilated storage areas. Workers should follow all applicable state and federal safety guidelines for entering oxygen depleted areas.

EVOQUA WATER TECHNOLOGIES

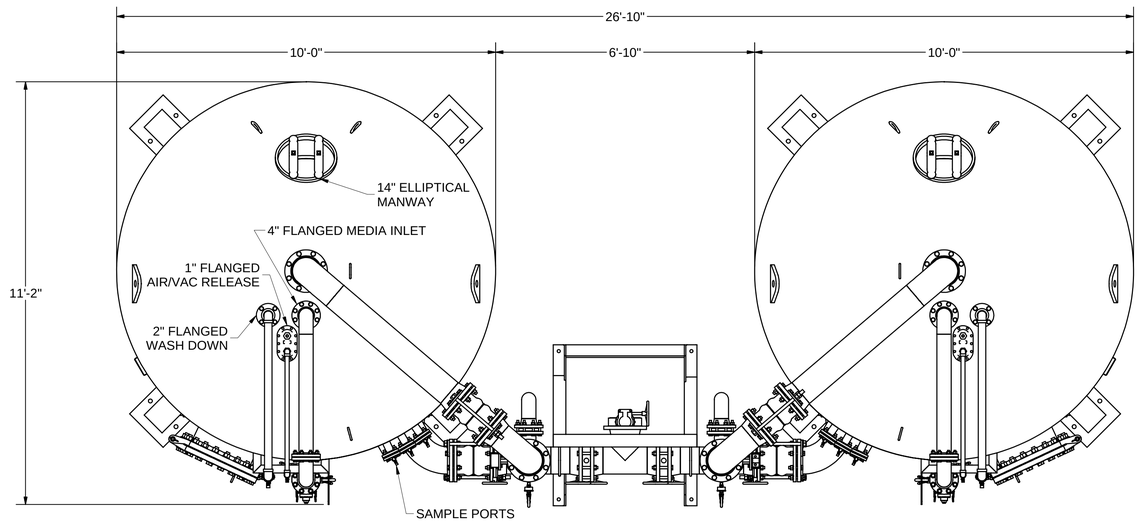
4800 North Point Parkway, Suite 250, Alpharetta, GA 30022

+1 (866) 926-8420 (toll-free) **+1 (978) 614-7233** (toll) **www.evoqua.com**

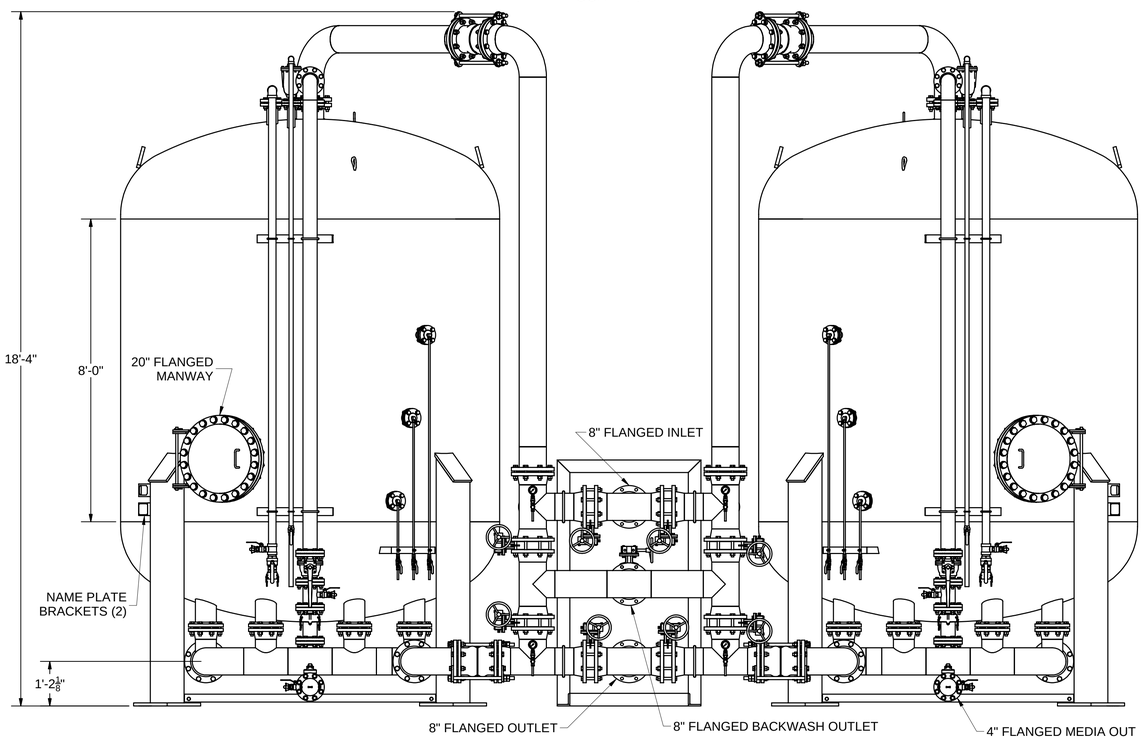
HP is a trademark of Evoqua, its subsidiaries or affiliates, in some countries.

All information presented herein is believed reliable and in accordance with accepted engineering practices. Evoqua makes no warranties as to the completeness of this information. Users are responsible for evaluating individual product suitability for specific applications. Evoqua assumes no liability whatsoever for any special, indirect or consequential damages arising from the sale, resale or misuse of its products.

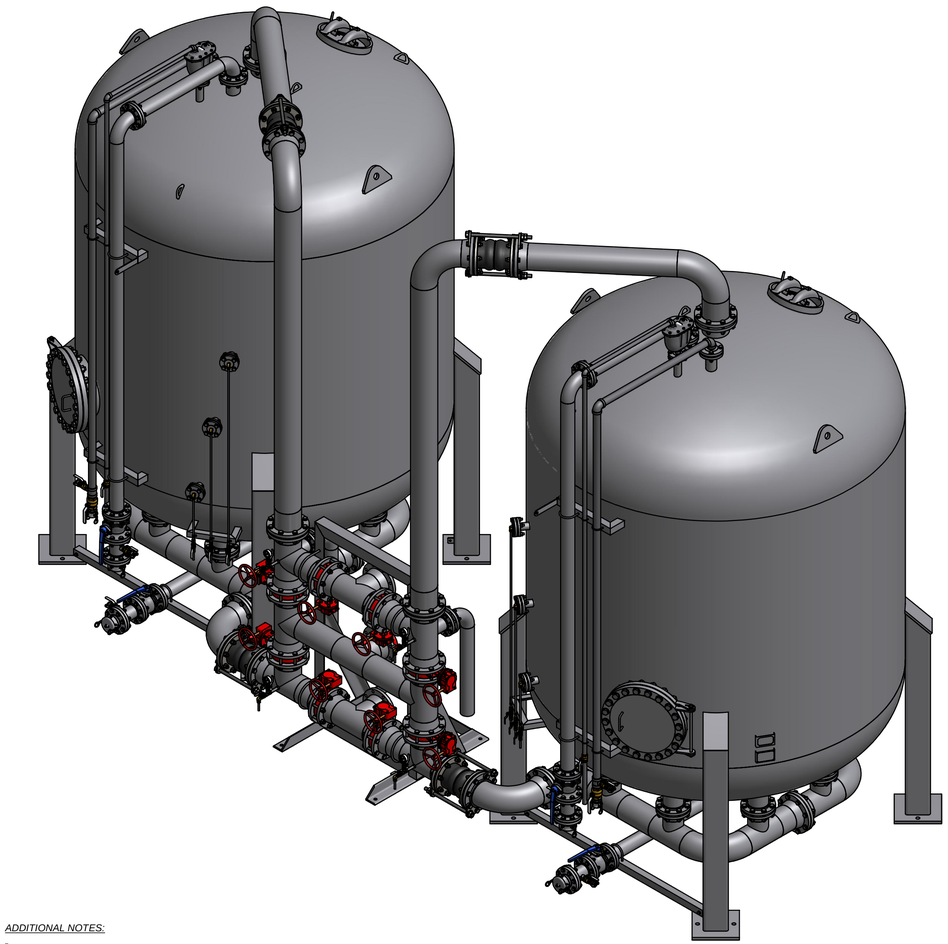
© 2014 Evoqua Water Technologies LLC Subject to change without notice WS-HP-DS-0614



PLAN VIEW
SCALE 1/2" = 1'



ELEVATION VIEW
SCALE 1/2" = 1'



ADDITIONAL NOTES:

1.) THIS DRAWING IS TO SHOW PIPING AND EQUIPMENT FOR CUSTOMER APPROVAL.
2.) ALL BUTTERFLY VALVES ARE DUCTILE IRON WITH STAINLESS TRIM, STAINLESS STEEL DISK.
3.) PROVIDE 316 STAINLESS STEEL SEPTA UNDER DRAIN SCREENS.
4.) VESSELS SHALL BE 125 PSI, ASME CODE.
5.) FINISH INTERIOR WITH PLASITE 4110, PREPARE AND APPLY STRICTLY IN ACCORDANCE WITH MANUFACTURERS RECOMMENDATIONS TO MEET NSF STD 61 REQUIREMENTS.
6.) PIPING MATERIALS SHALL MEET: CS PIPE ASTM A-53 GRADE B (ERW); CS FITTINGS SA-234, ASME B16.9; SS THREADED FITTINGS ASTM A-351; SS PIPE ASTM A-312; SS BW FITTINGS ASTM A-403; MI THREADED FITTINGS ASME B-16.3.
7.) FINISH EXTERIOR WITH CARBOGAURD 133 URTHANE COLOR TO BE 9225 CASHEW OVER CARBOLINE 888 RUST PREVENTATIVE EPOXY PRIMER APPLIED PER MFG. RECOMMENDATIONS.
8.) SYSTEM ESTIMATED SHIPPING WEIGHT: 35,000 LBS.
9.) GROUTING BY OTHERS IF REQUIRED.
10.) ± 2" TOLERANCE ON CONNECTION DIMENSIONS.
11.) DESIGNED FOR SEISMIC ZONE 4.
12.) SYSTEM PROCESS CONNECTIONS: 8" 150# RF FLANGES, BOLTS STRADDLE CENTERLINE AS SHOWN.
13.) CARBON CAPACITY: 20,000 LBS PER VESSEL.
14.) MAX. PROCESS FLOW: 750 GPM SERIES, 1,500 GPM PARALLEL.
15.) TYPICAL BACKWASH RATE (8X30 CARBON 55°F): 750 GPM.
16.) OPERATING TEMPERATURE 140° F MAX.

REV	DESCRIPTION	DATE	DWN	CHKD	APVD	ECN

STD: BORDER-1101-22X34D

INTL REF:

BAR = 1" AT PLOT SCALE

COMPANY CONFIDENTIAL
THIS DOCUMENT AND ALL INFORMATION CONTAINED HEREIN ARE THE PROPERTY OF EVOQUA AND/OR ITS AFFILIATES. THE DESIGN CONCEPTS AND INFORMATION CONTAINED HEREIN ARE PROPRIETARY TO EVOQUA AND ARE SUBMITTED IN CONFIDENCE. THEY ARE NOT TRANSFERABLE AND MUST BE USED ONLY FOR THE PURPOSE FOR WHICH THE DOCUMENT IS EXPRESSLY LOANED. THEY MUST NOT BE DISCLOSED, REPRODUCED, LOANED OR USED IN ANY OTHER MANNER WITHOUT EXPRESS WRITTEN CONSENT OF EVOQUA. IN NO EVENT SHALL THEY BE USED IN ANY MANNER DETRIMENTAL TO THE INTEREST OF EVOQUA. ALL PATENT RIGHTS ARE RESERVED. UPON THE DEMAND OF EVOQUA, THIS DOCUMENT, ALONG WITH ALL COPIES AND EXTRACTS, AND ALL RELATED NOTES AND ANALYSES, MUST BE RETURNED TO EVOQUA OR DESTROYED, AS INSTRUCTED BY EVOQUA. ACCEPTANCE OF THE DELIVERY OF THIS DOCUMENT CONSTITUTES AGREEMENT TO THESE TERMS AND CONDITIONS.

DESIGNER	AJA	DATE 2/24/2015
CHECKER		DATE
ENGINEER		DATE
MANAGER		DATE
FILE:		
SCALE:	1/2" = 1'	

TITLE: VESSEL 10FT 20K LB HP 125PSI SYS FX CS
W3T257665

CLIENT

EVOQUA WATER TECHNOLOGIES

Industry Inc.
Red Bluff, Ca
530-527-2664

PROJECT	CODE	DRAWING	SHEET	REV
	SALES	HP1020SYS-FX-CS	1 OF 1	0

C:\RBFR_Vault\Standards\HP1020\HP1020SYS-CS-FX\HP1020SYS-CS-FX - SALES.idw

Brandenburg® Industrial Service Company
2625 S. Loomis
Chicago, IL 60608
Phone (312) 326-5800
FAX (312) 326-5055

Brandenburg®

www.Brandenburg.com

VEHICLE RADIATION DETECTION SYSTEM SPECIFICATIONS

Prevent costly radioactive contamination of your scrap yard, steel plant, equipment, product and personnel with the RC4000 series vehicle radiation detection system!

- Innovative Design with Multiple Detector Sizes
- Energy Specific Alarm and Background Statistical Analyses
- Real-Time Density Tracking Algorithm
- Unique PVT Aging Monitoring
- Network Capability with Email
- Easy to install, User Friendly, Easy to Operate
- Neutron Detection Capability (Optional)

RC4000

VEHICLE RADIATION DETECTION SYSTEMS

Detection of Radioactivity in High Density Materials

The RC4000 series of radiation detection systems have been designed to detect very low Gamma Ray emissions in high density materials. The vehicle size and type will help determine the appropriate panel size and configuration. The RC4000 is supplied in three detector panel sizes (69L, 91L, 138L) with any configuration with up to 8 detector panels. The RC4000 detection systems all utilize RadComm's high quality specially prepare Polyvinyl Toluene (PVT) scintillators, electronics and Photomultiplier Tubes (PMT´s).

Simplified System Operation

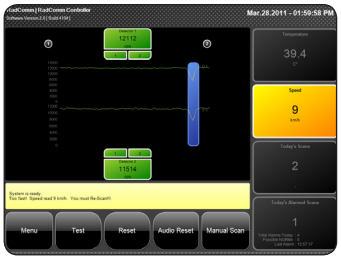
The RC4000 utilizes real-time statistical algorithms that are based on Gamma Energy Distribution to ensure alarm thresholds levels are optimized. The RC4000 utilize a User Friendly Graphical interface allowing the operator to easily move through the wide range of User options. All detailed Clean Scan, Testing and Alarms records are stored on the internal hard drive and can be easily retrieved and interpreted as required.

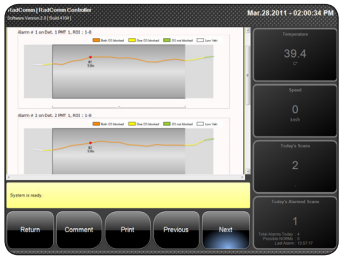
Remote System Access

The RC4000 Controller is equipped with a network adaptor allowing remote monitoring, data retrieval and maintenance functions. The internal software and hardware designs are extremely flexible allowing remote software updates and electronic hardware adjustments when necessary. Supervisors can monitor the system operation in real-time to ensure normal system operation is maintained. Also, with a network connection the system has the capability of emailing alarms and system malfunctions.

The 4000 series consists of:

- Detector assemblies (1-8 panels)
- RadLink embedded controller
- Smart Infrared presence sensors
- Large touch screen monitor
- Remote communications package (optional)





RadLink Controller features

- Large touch screen LCD monitor
- Large storage capacity for system operational information and alarms
- Easy to follow multilingual menu outlines and descriptions
- Multi-level security password control
- Detailed alarm and scan data storage
- Manual scanning for pinpointing source location within the vehicle's load
- Easy to set alarm configuration menu
- Network access for remote service and monitoring
- Radiation levels displayed in counts per second (mR/h, nSv/h)
- Vehicle speed measurement in Km/h or mph
- Ambient temperature displayed in Celsius and Fahrenheit
- Adjustable audio alarm
- Counter for number of scans in a 24 hour period for incoming and outgoing scans
- Detailed alarm information displayed and stored after every alarm
- Various String Outputs
- Configurable email reporting
- Adaptable for specific customer needs

Detector features

- Large premium grade PVT scintillators
- 34.3 to 69 liters PVT volumes available (single panel)
- Low density shield on face of detector panel
- Dual layer thermal insulation protection (-20° to +55°C)
- High signal to noise ratio PMTs (up to 2)
- High speed micro-controller with programmable CPLD technology for signal/alarm analysis
- Dual input high speed pulse processor
- Noise reduction hardware/software
- Background characterization for variable ambient background suppression
- Smart infrared vehicle presence with speed monitoring
- 8 output drivers (24Vdc@50mA) for remote indicators
- Internal non-radioactive test source for detailed and repeatable system checks
- 24Vdc input voltage @2.3A (8 Panels)
- Suitable for Vehicle, Rail, Charge Bucket, Offgas, Conveyor Systems

Options

- Camera
- External alarms
- Supervisory Software
- Neutron Detector (He3 or alternative)

Energy range: 20KeV to 3.0MeV (incident)

Model #	RC4069	RC4110	RC4138
System Size (in^3)	4,216	5,264	8,432
System Size (L)	69	91	138
System size is based on 2 panels. Systems may be expanded with additional panels			
PER/Panel Size (in^3)	2,108	2,632	4,216
PER/Panel Size (L)	34.5	45.5	69
# of PMT's/panel	1	2	2
*Detection Capability/Overall Sensitivity- Unshielded Source (Shielded Source)	1.6uCi (58mCi)	1.4uCi (50mCi)	1.1uCi (41.mCi)

*** Radiation meausrement of 137Cs (point source) at 1 meter from the face of the detector (the radiation exposure level is comparable to a 75mmø x 150mm 137Cs lead sealed source buried in 65 lbs/ft^3 (1.0 g/cm^3) of scrap metal)**

Corporate Head Office
Scott Aikin
Saikin@radcommsystems.com
Jeff Adams
jadams@radcommsystems.com
2931 Portland Drive
Oakville , ON Canada L6H 5S4
Tel. +1 (905) 829-8290
Toll Free: 1 (800) 588-5229
Fax: +1 (905) 829-1406

USA
Joshua Hunter
jhunter@radcommsystems.com
602 E. Lincolnway Ave.
Valparaiso, IN USA 46383
Tel. +1 (773) 680-8430
Toll Free: 1 (800) 588-5229
Fax: +1 (219) 510-5764

China
Zhenhau Wang
wang.zhenhau@ehc-global.com
212-215 Malu Industrial Park, No. 58
Chen Bao Rd., Jiading
Shanghai, 201801, China
Tel. +86-21-69153031
Fax: +86-21-69153231

Black Sea
Osman Tureyyen
metkim@metkim.com
Kavacik, Onarimli Sokak
No 9 Altay Han
Daire: 8 Beykoz, Istanbul, Turkey
Tel. +90 (216) 425-1412
Fax: +90 (216) 425-1432

Europe
Wim van Hove
wim.van.hove@radcommeurope.com
Watertorenweg 32, 2230 Herselt, Belgium
Tel. +32.14.75.02.13 Fax: +32.14.75.02.16

Mexican Office
Eduardo Ballesteros
analiticacontrol@prodginy.net.mx
Amatista No.27, El Pedregal
Atizapan de Zaragoza, 52948, Estado De Mexico
Tel: (52) 55 5077 4633/(52) 55 3615 4910

RadComm
Radiation Detection Systems