		<b>BASIN ELECTRIC POWER COOPERATIVE LARAMIE RIVER STATION PROCEDURE</b>			
		<b>Origination Date:</b> 3/8/10	<b>PRMP</b> <div style="border: 1px solid red; padding: 2px; display: inline-block;">X</div>	<b>Procedure No.:</b> SAF-EPB-022	<b>Revision No.:</b> 6
<b>Affected Area(s):</b>  <p style="text-align: center;"><b>PLANT WIDE</b></p>			<b>Originated By:</b> <p style="text-align: center;">Reena McCoy, Becky Glasson, David Herriott</p>		
			<b>Reviewed By:</b> E. Min, T. Vaughn		<b>Date:</b> 05/17/2022
<b>Subject:</b> <p style="text-align: center;"><b>HOT WORK PROGRAM</b></p>					

## 1.0 PURPOSE/SCOPE

- 1.1 The purpose of this program is to establish control over work that requires the use of electrical or gas welding, cutting, soldering, brazing, burning or similar flame or spark producing operations, open flames, power tools or any tool that may provide an ignition source. Additionally, this program is meant to:
- 1.1.1 Ensure that flammable or combustible materials are absent, isolated, protected, or removed from work sites requiring the use of tools or equipment that may provide an ignition source.
  - 1.1.2 Minimize hot work in classified systems by pre-fabbing in shops and using mechanical fasteners and other alternative methods whenever practical. Classified systems include activated carbon, sewage treatment, turbine lube oil, coal, ammonia, hydrogen, fuel oil systems, all diesel and /or fuel tanks and systems.
- 1.2 This program does not apply to areas that are specifically designed and equipped for hot work such as designated welding areas and the Mechanical / Electrical Maintenance Shops, provided they are isolated, or at a sufficiently safe distance from flammables and combustibles.
- 1.3 This program does not cover hot work operations in confined spaces. Those requirements are covered in the Confined Space Entry Program (SAF-EPB-014).
- 1.4 This program does apply to the use of power tools on classified systems. See the definition of classified systems for clarification.

## 2.0 DEFINITION OF TERMS

- 2.1 Auxiliary Heating Device: Approved supplemental heating equipment such as fire barrels, kerosene, propane, or electrical heaters.
- 2.2 Catastrophic Release: A major release of ammonia, hydrogen or any other hazardous chemical resulting from uncontrolled developments which lead to, or could have led to, serious danger to persons both within and outside the work place.
- 2.3 Classified System: An area or system that has been determined to have a general nature (or properties) of a hazardous material in the surrounding atmosphere. Systems included are coal, ammonia, hydrogen, turbine lube oil system, activated carbon, sewage treatment, and all diesel and/or fuel tanks and systems.



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- 2.4 Dust Ignition Proof: A component that prevents dust entering from outside. Arcs, sparks and heat generated inside of the enclosure will not be able to ignite the exterior surroundings near the component.
- 2.5 Explosion Proof: A component capable of keeping an internal explosion of a specific flammable air-vapor mixture within the component enclosure without releasing burning or hot gases to the internal environment which may be a potential explosive. The explosion proof equipment must also operate below safe temperature.
- 2.6 Fire Watch: A qualified employee or contractor employee who observes hot work activities for the purpose of preventing, detecting, and suppressing fires. The Fire Watch must be trained to use manual firefighting equipment and have the ability to summon emergency assistance if needed.
- 2.7 Hot Work: Any work involving electric or gas welding, cutting, brazing, burning or similar flame or spark producing operations and open flames. This includes, but is not limited to, acetylene torches, arc welding equipment, portable grinders, propane torches, powder actuated guns, cordless impacts, power tools and non-related electrical tools and equipment.
- 2.8 Hot Work Permit: the written authorization to perform operations (welding, cutting, soldering, heating, etc.) capable of providing a source of ignition. The permit contains:
- 2.8.1 The minimum fire precautions listed in this procedure.
  - 2.8.2 The nature and location of work to be performed.
  - 2.8.3 The date and time duration that work will commence.
  - 2.8.4 A space for signatures.
- 2.9 Hot Work Permit Designated Area: This is defined as an area where other than a minor fire might develop or where any of the following conditions exist. (See appendix for a list of areas).
- 2.9.1 An area that has a high amount of flammable or combustible material adjacent to the hot work activity.
  - 2.9.2 Flammable or combustible material is more than 35 feet away but is easily ignited by sparks.
  - 2.9.3 Wall or floor openings within a 35-foot radius expose combustible material in adjacent areas including concealed spaces in walls or floors.
  - 2.9.4 Combustible materials are adjacent to the opposite side of metal partitions, walls, ceilings or roofs, and are likely to be ignited by conduction or radiation.



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2.9.5 Areas where flammable gas (LEL) testing is required.

2.9.6 Areas with an accumulation of combustible dusts that could develop an explosive atmosphere.

2.10 Intrinsically Safe: Incapable of releasing sufficient electrical or thermal energy to cause ignition of a specific hazardous substance under normal or abnormal (fault) operating conditions.

2.11 On-Site Coordinator: Laramie River Station or other Basin Electric Power Cooperative on-site employee that interfaces with contractors.

2.12 Operating Authority: The Supervisory Staff in the Operations Section is the "Operating Authority" in the power plant and the administrator of this Hot Work Program.

2.13 Permit Duration: Required time duration allotted for the scope of work, this is located on the Hot Work Permit.

2.14 Power Tool: A tool that is actuated by an additional power source and mechanism other than the solely manual labor used with hand tools i.e. a torch, grinder, pneumatic, cord or cordless tool.

2.15 PSM/RMP Covered Process: All activities and equipment involved with the receipt, storage, handling or movement of a substance included in either the PSM or RMP regulations including utility systems, required for the safe operation of the Anhydrous Ammonia, and Hydrogen systems. For purposes of this definition, any group of equipment that is interconnected and separate equipment that is located such that ammonia, or hydrogen could be involved in a potential release shall be considered a single process. At LRS both PSM and RMP processes are covered by the Process Risk Management Program (PRMP).

2.16 Qualified Employee: A qualified employee is an individual that has been trained on and understands the Hot Work Program requirements.

2.17 Required Precautions Checklist: The checklist found on the right side of the Hot Work Permit. This checklist is completed by the qualified employee before a Hot Work Permit is authorized.

2.18 Source of Ignition: A flame, tool spark, static electric charge, or electric spark that could provide the energy necessary to ignite a hazardous atmosphere and cause a fire or explosion.

2.19 Supervisory Authority: The Plant Manager is the "Supervisory Authority" of this Hot Work Program and administers manning the installation, maintenance, and the operations of the program. This person may designate this authority when necessary.

### 3.0 RESPONSIBILITY / APPLICABILITY

3.1 This program applies to employees and contractors performing Hot Work at Laramie River Station (LRS).



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**3.2 Safety and Training Group** is responsible for:

- 3.2.1 Evaluating the work activities at the station on an ongoing basis to ensure that Hot Work Permits are being completed prior to the start of the work.
- 3.2.2 Providing assistance to supervisors as required.
- 3.2.3 Ensuring training is provided as required for this program.
- 3.2.4 Maintaining all training records.
- 3.2.5 Retaining all Hot Work Permits for one year.

**3.3 Supervisory Authority** is responsible for:

- 3.3.1 Safe administration of this Hot Work Program.
- 3.3.2 Designating the roles of responsibility for which individuals are qualified to perform hot work and be entered into the program.
- 3.3.3 Enforcing the Hot Work Program and the disciplinary actions regarding violations of the program.

**3.4 Operating Authority** is responsible for:

- 3.4.1 Ensuring that the Required Precautions Checklist portion of the Hot Work Permit (the right hand column of the form) has been reviewed in the area where hot work will be performed and that it is filled out properly on the form.
- 3.4.2 Issuing a Clearance or Confined Space Permit if necessary, and when all requirements per the Clearance and Confined Space Permitting Procedures have been followed and approved (See Clearance and Confined Space Programs).
- 3.4.3 Issuing the Hot Work Permit.
- 3.4.4 Authorizing hot work by signing the permit when all necessary hot work precautions have been taken. Ensuring that when working on any piping or vessels containing ammonia, hydrogen or any other flammable or combustible, they have been disconnected or blanked, completely cleaned out and purged before a Hot Work Permit is issued.
- 3.4.5 Retaining the Hot Work Permits in their Control until completed, and then turning in completed forms to safety personnel.

**3.5 Supervisors** are responsible for:



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- 3.5.1 Ensuring that employees performing hot work are knowledgeable in the permit system, the proper use of tools and equipment, and the proper use of personal protective equipment.
  - 3.5.2 Designating hot work areas outside the Mechanical / Electrical Maintenance Shops.
  - 3.5.3 Providing the proper training for the use of tools, equipment and personal protective equipment.
  - 3.5.4 Ensuring that all elements identified on the permit are completed as required.
  - 3.5.5 Ensuring that all air monitoring tests have been completed and noted on the permit.
  - 3.5.6 Ensuring that the Hot Work Permitting Program is being followed in all areas.
  - 3.5.7 Reviewing the list of hot work precautions and any additional precautions with individuals requesting a Hot Work Permit.
  - 3.5.8 Ensuring that the Hot Work Permit is available in the work area during hot work.
  - 3.5.9 Ensuring that a qualified Fire Watch is in the immediate area until hot work is completed.
  - 3.5.10 Periodically inspecting hot work activities to ensure compliance with the program.
- 3.6 **Fire Watch** is responsible for:
- 3.6.1 Ensuring that safe conditions are maintained during hot work operations.
  - 3.6.2 Signing on the Hot Work Permit as the Fire Watch.
  - 3.6.3 Stopping hot work activities if an unsafe condition develops.
  - 3.6.4 Having fire extinguishing equipment that:
    - Is readily available.
    - Has current inspection.
    - Contains proper fire suppressant for area working in.
  - 3.6.5 Being knowledgeable in the use of fire extinguishing equipment.
  - 3.6.6 Watching for fires and attempting to extinguish them only when the fires are within the capacity of the equipment available.



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- 3.6.7 Notifying the Unit 1 Control Room if a fire is detected and not within their capacity, in accordance with the Emergency Action Plan.
- 3.6.8 Remaining in the hot work area during the entire period of hot work activities, during lunch and breaks when applicable, and for 60 minutes after work is completed.
- 3.6.9 Returning the Hot Work Permit to the Operating Authority after the 60 minute watch is complete.

**3.7 Qualified Employees** are responsible for:

- 3.7.1 Informing the Operating Authority or designee of planned work activities requiring a Hot Work Permit.
- 3.7.2 Obtaining a Hot Work Permit form and completing the Required Precautions Checklist to ensure that all precautionary measures have been taken before requesting a Hot Work Permit.
- 3.7.3 Bringing the Hot Work Permit Form, with the Required Precautions having been completed, to the Operating Authority and obtaining a Hot Work Permit.
- 3.7.4 Obtaining a Clearance and/or Confined Space Permit if required (see Clearance and Confined Space Programs).
- 3.7.5 Conducting initial and continuous air monitoring tests per the permit, and documenting results.
- 3.7.6 Establishing the permit duration.
- 3.7.7 Ensuring that all elements identified on the permit are completed as required.
- 3.7.8 Signing on the Hot Work Permit.
- 3.7.9 Having the Hot Work Permit available at the location.
- 3.7.10 Ensuring there is an appropriate fire extinguisher readily available at the hot work site.
- 3.7.11 Conducting hot work activities within the parameters and permit duration.
- 3.7.12 Stopping hot work activities if any new hazards are introduced to the area.
- 3.7.13 Ensuring that tools and equipment are in satisfactory condition and good repair.
- 3.7.14 Ensuring the proper use of all personal protective equipment.



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- 3.7.15 Protecting nearby personnel with welding screens against heat, arc, sparks, etc. when working in occupied areas.
- 3.7.16 Ensuring that the Fire Watch returned the Hot Work Permit to the Operating Authority after they completed the 60 minute inspection.
- 3.7.17 Ensuring that when working on any piping or vessels containing ammonia, hydrogen, or any other flammable or combustible that they have been disconnected or blanked, completely cleaned out and purged before a Hot Work Permit is issued.
- 3.7.18 Securing all compressed gas cylinders from falling and ensuring that all cylinders not in use have valves completely closed and protective caps installed.

### 3.8 **Contractors** are responsible for:

- 3.8.1 Initiating hot work activities with the LRS On-Site Coordinator and/or the Operating Authority.
- 3.8.2 Obtaining a Hot Work Form and completing the Required Precautions Checklist.
- 3.8.3 Bringing the Hot Work Form, with the Required Precautions having been completed, to the Operating Authority before a Hot Work Permit is authorized.
- 3.8.4 Understanding and following LRS Hot Work Permitting Procedures.
- 3.8.5 Obtaining a Hot Work Permit from the LRS Operating Authority.
- 3.8.6 Ensuring that the Hot Work Permit is returned to the Operating Authority after the 60 minute Fire Watch is completed.
- 3.8.7 Providing a trained employee that is knowledgeable of the Hot Work Program to serve as a Fire Watch for their hot work activities.

### 4.0 **PROCEDURES / GUIDELINES:**

- 4.1 Hot work should not be performed in any area if the work can be avoided or performed in a safer manner. When possible, materials to be welded, cut, or heated shall be moved to a designated welding area or the Mechanical / Electrical Maintenance Shops provided they are isolated and at a sufficiently safe distance from flammables and combustibles.
- 4.2 Proper fire extinguishing equipment needs to be available if the fire protection system is being repaired.
- 4.3 **Prohibited Conditions:**

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4.3.1 A Hot Work Permit will not be issued if ANY of the following conditions exist:

- Operating Authority has not authorized the work.
- Fire protection is impaired in sprinkler equipped buildings.
- Appropriate firefighting equipment is not readily available.
- In the presence of explosive atmospheres.
- Flammable or combustible materials are within 35 feet and cannot be moved or protected.
- Floor or other openings cannot be covered.
- Cutting or welding on pipes or other metals could conduct enough heat to ignite nearby combustible materials.
- Power tools fail the pre-job inspection and are not in good working order.
- Any condition that could result in undue hazards by performing the work.

4.4 The Qualified Employee will obtain a Hot Work Form and complete the Required Precautions checklist to ensure that all precautionary measures have been taken before a Hot Work Permit will be issued.

4.5 Once the Required Precautions have been taken and the checklist has been completed, the Qualified Employee will request a Hot Work Permit from the Operating Authority.

4.6 The Operating Authority will be responsible for issuing Hot Work Permits.

4.6.1 When a Hot Work Permit is Required the Operating Authority and/or Supervisor and the Qualified Employee will:

- Review the work to be done, including tools, equipment, and materials to be used and the safe work practices to be followed.
- Ensure that proper fire extinguishing equipment is available if the fire protection system is being repaired.
- Identify areas to be cleaned, isolated, protected, and/or determine all flammable and combustible materials to be removed from the area.
- Identify areas such as floors, walls or roofs of combustible materials that must be wetted down or covered with wet sand or fire resistant blankets.





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- Determine if combustible materials are present and whether materials must be relocated at least 35 feet from the hot work site.
- Determine if relocation is impractical and whether combustibles shall be protected with fire resistant covers or shielded with metal guards.
- Determine if welding screens should be installed to protect anyone who passes by.
- Determine if atmospheric monitoring of the area is required.
  - In the case of arc welding or any gas cutting, grinding or other spark production activity, an area extending 35 feet in radius from the job and all levels below the work must be reviewed for the possibility of flammable or combustible liquids, gases, or dusts.
  - Areas where atmospheric monitoring may be required include, but are not limited to:
    - ❖ Storage tanks or piping containing flammable or combustible liquids.
    - ❖ Chemical storage areas such as bulk acid or ammonia tanks, chemical containers and drums.
    - ❖ Battery charging and storage areas or rooms.
    - ❖ Sewer drains, tank vents, manholes, sumps and drainage.
    - ❖ Coal System.
- Continuous atmospheric monitoring of the job site may be necessary in locations where hazardous vapors may accumulate. This requirements must be indicated on the Hot Work Permit when implemented. If any changes are detected, the Qualified Employee must notify the Operating Authority and/or supervisor immediately.
- Initial gas tests must be performed immediately prior to the first arc, spark or ignition source being created, or use of a power tool, and recorded on the permit.
- Discussion of the planned work should ensure that sparks and molten slag from welding and/or grinding are confined to the work area and prevented from falling to floors below or entering wall or roof openings or other such areas. Barricading and signage may be required on floors or levels below the hot work site.



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- Determine if a Clearance or a Confined Space Permit is needed in combination with the Hot Work Permit and follow those programs (Reference: LRS Clearance Program and LRS Confined Space Program).
- The Hot Work Permit must be attached to the Confined Space Permit if they are both required, before performing any hot work.
- If working on any piping or vessels containing ammonia, hydrogen, or any flammable or combustible materials they must be disconnected or blanked, completely cleaned out, and purged before commencing work. Safe work practices for opening piping and equipment must be strictly followed, and continuous air monitoring conducted.
- Ensure that all compressed gas cylinders are secured and that all cylinders not in use have valves completely closed and protective caps installed.

#### 4.6.2 Following review of work scope, the Operating Authority will:

- Identify and document on the Hot Work Permit the location where the hot work will be performed, what equipment will be used and who will perform the hot work.
- Document a Qualified Employee whose sole assignment is Fire Watch and an appropriate fire extinguisher is provided at the location.
- Document any special precautions and fire equipment requirements the Qualified Employee and Fire Watch must follow.
- Determine, with the employees, the need for any additional precautions which may include fire blankets for spark/heat containment, welding screens or additional fire extinguishers.
- Sign the permit and include the date and time.

4.7 Once the Operating Authority has signed the Hot Work Permit, a qualified employee and Fire Watch will sign on to the permit verifying that they have reviewed the requirements with the Operating Authority and understand their responsibilities.

4.8 A copy of the Hot Work Permit will be kept in the Control Room until all work and fire watch has been completed (the electronic copy located in NiSoft meets this requirement). The original permit will go with the Qualified Employee to be available at the Hot Work location until all work and Fire Watch is complete.

4.9 Hot Work Permits will cover the length of time that is required to complete the job and will not exceed one shift. When jobs extend beyond one shift, the relieving Operating Authority will:



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- 4.9.1 Review the requirements of the Hot Work Permit written previously.
- 4.9.2 Inspect the area, equipment, or process.
- 4.9.3 Issue a new Hot Work Permit, if all requirements are met.
- 4.10 Working Under a Hot Work Permit
  - 4.10.1 The Hot Work Permit will be available at the job site.
  - 4.10.2 The Qualified Employee working under a Hot Work Permit shall follow all precautions itemized on the permit. All required protective equipment shall be in place prior to starting the task.
  - 4.10.3 Fire extinguishers located in the general area of the hot work shall be utilized if a smoldering activity or fire is detected.
  - 4.10.4 The assigned Fire Watch shall watch for fires in all exposed areas, and attempt to extinguish any fires within the capacity of the equipment available after notifying the Control Room.
  - 4.10.5 Hot work is only authorized for the personnel, tasks and times listed on the Hot Work Permit and only performed in those areas listed on the permit.
  - 4.10.6 When all hot work has been completed and the area has been restored to its original classification:
    - The Fire Watch shall remain at the work site for a minimum of 60 minutes following completion of all hot work jobs.
    - During this time the Fire Watch shall inspect for smoldering materials or hot spots and wash down potential fire areas.
    - Following the 60 minutes, the Fire Watch will sign off on the hot work permit indicating the watch period has been completed and return the permit to the Operating Authority.
    - The area will be monitored routinely for a minimum of 3 hours after the 60 minute Fire Watch has been completed. The Operating Authority will designate a Qualified Employee for this duty.
    - The Qualified Employee will sign the Final Check-up section on the Permit once the three hours fire watch has been completed.



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- Once completed, Hot Work permits are given to Safety and Training personnel and retained for one year.

4.10.7 The grounding clamp for an electric welding machine is an ignition source and should be clamped as close as feasibly possible to the material being welded.

4.10.8 Engine driven electrical arc welding equipment shall have a separate auxiliary ground wire which is connected from the equipment frame to a proper ground. This requirement only applies when the welder is being used for auxiliary 110V power.

4.10.9 Once work is started under a Hot Work Permit, the Qualified Employee(s), if required to leave the area for any reason, must ensure that a Fire Watch remains for the appropriate time.

- A Fire Watch shall be provided during breaks and lunch and for at least 60 minutes after the work is completed.
- For LRS work activities, personnel from the operations department may act as the Fire Watch during lunch or break and after the work is complete if their job duties allow them to keep check on the area after being notified by the employee who performs the hot work. The Operating Authority must give prior permission by indicating this on the Hot Work Permit in the Special Requirements section of the permit.

4.10.10 A Hot Work Permit does not authorize smoking at the permitted site.

4.10.11 A Hot Work Permit may be cancelled at any time where conditions have changed, making continuation of the work hazardous. All permits are automatically voided when a fire or emergency conditions has been identified. In that event, the permit holder should cease operations and secure all equipment in a safe manner without delay.

4.10.12 If hot work is being conducted inside a confined space, the Clearance and Confined Space Programs need to be followed.

4.10.13 At work areas, hazards other than hot work may be present, such as noise, chemicals and radiation. Any additional PPE donned for protection against these other hazards should be appropriate for hot work activities, not easily ignited.

## 5.0 **TRAINING:**

5.1 Affected employees shall be trained on this procedure initially and every two years thereafter.

5.2 Training shall meet the requirements of NFPA Standard 51B, ANSI/ASC Z49.1 and OSHA requirements found in 1910.252(a) and 1910 - Subpart L.



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5.3 Training will be provided to all employees whose work may be regulated by these procedures. Understanding the responsibilities and procedures outlined above will be the primary objective of the training.

5.4 Training will be provided:

5.4.1 Before the employee is first assigned duties covered by this procedure.

5.4.2 Before there is a change in assigned duties.

5.4.3 Whenever there is a change in Hot Work operations that presents a hazard about which the employee has not previously been trained.

5.4.4 Whenever there is a deviation from the work scope.

5.4.5 Whenever there is a deficiency in the employee's knowledge.

5.5 The training will establish employee proficiency in the duties required by these procedures and will introduce new or revised procedures as necessary for compliance with these procedures.

**6.0 ATTACHMENTS:**

6.1 Hot Work Permit

<https://altien.bepc.net/adm/links.aspx?id=Library.00F5FBB2-6F19-4972-AA6C-F0EF1B96E32A>

**7.0 REFERENCES:**

7.1 OSHA 1910 Subpart L; Fire Protection

7.2 OSHA 1910.252, General Welding Requirements.

7.3 OSHA 1910.253; Oxygen Fuel Gas Welding and Cutting.

7.4 OSHA 1920.254; Arc Welding and Cutting

7.5 OSHA 1910.119; Process Safety Management of Highly Hazardous Chemicals Paragraph (k).

7.6 NFPA Standard 51B; Fire Prevention in Use of Cutting and Welding Process.

7.7 ANSI/ASC Z49.1; Safety in Welding Cutting, and Allied Processes

7.8 40 CFR Part 68; Accidental Release Prevention Requirements: Risk Management Programs under the Clean Air Act, Section 112(r)(7).

7.9 40 CFR Parts 9 and 68; List of Regulated Substances and Thresholds for Accidental Release Prevention and Risk Management Programs for Chemical Accidental Release Prevention, Final Rule and Notice.

7.10 OSHA Instruction CPL 2-2.45A; Process Safety Management of Highly Hazardous Chemicals- Compliance Guidelines and Enforcement Procedures, September 13, 1994.



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- 7.11 LRS Clearance Program.
- 7.12 LRS Confined Space Program.

**APPENDIX A: Hot Work Permit Designated Areas:**

- Acid Storage Tanks
- Acid Lines: Unit 1, 2, and 3
- Fuel Oil Pump and Piping
- Fuel Oil Storage Area
- Hydrogen Seal Oil System to include: Surrounding areas of Main Generator and Hydrogen Storage
- Coal System to include: Coal Pile Storage; Rotary Dumper; Pulverizers (Not Inerted); All Conveyor Galleries; Cascade Areas; Transfer Buildings; Coal Bunkers; Coal Silos
- Vehicle Fuel Storage Area
- Oil and Paint Storage Areas
- Lube and Oil Storage Areas
- Warehouse(s)
- Office/Administration Building
- Cooling Towers (off-line)
- Battery Rooms
- Anhydrous Ammonia Systems

Approved By: *ED Min* ED Min (May 17, 2022 09:41 MDT) Date: \_\_\_\_\_

Approved By: *Tracy Vaughn* Tracy Vaughn (May 17, 2022 10:05 MDT) Date: \_\_\_\_\_