

Appendix C
General Health and Safety Procedures

1.0 PURPOSE

This procedure outlines basic procedures for safety meetings.

2.0 SCOPE

This procedure applies to all EFR employees.

3.0 RESPONSIBILITY

3.1 Supervisors shall ensure adherence to this procedure.

3.2 The Safety Department may provide supervisors with a list of safety topics.

4.0 PROCEDURE

4.1 Safety Meetings shall be held at least once a month; or whenever a special hazardous operation is to be conducted.

4.2 Safety meeting minutes will be filled out with each attending employee's signature. A list of topics discussed will also be included.

5.0 RECORDS

5.1 Each department shall keep a record of their safety meetings and the facility will keep the record on file for three (3) years. A copy of the safety meeting minutes shall be submitted to the Safety Department.

6.0 FORMS

6.1 Safety Meeting Minutes

APPROVALS	<i>Signature</i>	<i>Date</i>
RSO		
Plant Manager		

Energy Fuels Resources Piñon Ridge Mill Montrose County, Colorado	BLOODBORNE PATHOGEN EXPOSURE PROCEDURE	Number: HS-020 Page: 1 of 3 Revision: 0 Date: 10/07/09
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1.0 PURPOSE

The purpose of this procedure is to provide specific instructions to reduce workers risk by minimizing or eliminating employees’ exposure to bloodborne pathogens, such as the Hepatitis B Virus (HBV), non-A and non-B hepatitis, and Human Immunodeficiency Virus (HIV).

2.0 SCOPE

This procedure is designed for EFR’s employees when the hazard of blood or Other Potentially Infectious Material (OPIM) is encountered.

3.0 RESPONSIBILITY

- 3.1 Managers or Supervisors shall be responsible for the implementation of this program.
- 3.2 Employees shall comply with the following procedures:
 - 3.2.1 When blood or OPIM are encountered wear the appropriate PPE.
 - 3.2.2 Inform their supervisors of equipment that needs to be replaced.
 - 3.2.3 Inform their supervisors if they have been exposed.

4.0 OBJECTIVE

- 4.1 The objectives of this procedure are to:
 - 4.1.1 Provide guidance when occupational exposure or potential occupational exposure to blood and OPIM occurs.
 - 4.1.2 Provide procedures to eliminate or minimize employee exposure.

5.0 PROCEDURE

- 5.1 EFR will use universal precautions to prevent contact with blood or OPIM.
- 5.2 Employees shall wash their hands and skin with soap and water or flush mucous membranes with water immediately after contact with blood or OPIM and PPE removal.
- 5.3 Contaminated needles and other contaminated sharps shall not be bent, recapped, removed, sheared, or purposely broken.
- 5.4 Sharps shall be properly disposed of immediately after they are used.
- 5.5 Work area restrictions
 - 5.5.1 Eating, drinking, smoking, applying cosmetics or lip balm, or handling contact lenses shall not be permitted where exposure to blood or OPIM may occur.
- 5.6 **PERSONAL PROTECTION EQUIPMENT (PPE)**
 - 5.6.1 Employees shall wear PPE when they may be exposed to infectious or potentially infectious materials.
 - 5.6.2 PPE shall be worn to prevent contaminating a work surface or when helping a fellow employees dress a wound.

APPROVALS	<i>Signature</i>	<i>Date</i>
RSO		
Plant Manager		

5.6.3 Contaminated PPE shall be removed immediately and placed in an approved container. The Safety Department shall be contacted for disposing the container.

5.6.4 Contaminated saturated clothing shall not be laundered.

5.6.5 Contaminated PPE shall not be reused.

5.7 DISPOSAL

5.7.1 Biohazard labels shall be affixed to regulated waste containers; refrigerators and freezers containing blood and OPIM; and other containers used to store, move, or ship blood or OPIM. Tags can also be used to label containers or equipment.

NOTE: Red bags or red containers may be substituted for labels.

5.7.2. If applicable, place biohazard contaminated materials in biohazard waste containers as soon as possible. The Safety Department will contact the emergency service office for disposal assistance.

5.7.3 Biohazard waste shall be disposed in compliance with applicable federal and state regulations.

5.8 HOUSEKEEPING

5.8.1 Employees shall clean and decontaminate the area immediately when first aid procedures are performed in which blood or OPIM are encountered.

5.9 POST-EXPOSURE EVALUATION AND FOLLOW-UP

5.9.1 Exposures shall be reported, investigated, and documented.

5.9.2 After a reported exposure, the exposed employee shall immediately receive a confidential medical evaluation and follow-up.

5.9.3 Information shall be provided to the healthcare professional as required.

5.9.4 Healthcare professional's written opinion

5.9.4.1 Within 15 days after the evaluation is completed, the employee shall receive a copy of EFR's medical consultant's written opinion.

5.10 TRAINING AND INFORMATION REQUIREMENTS

5.10.1 Training shall be given to employees impacted by this procedure.

5.11 EVALUATION AND REVIEW

5.11.1 This program shall be reviewed annually to evaluate its effectiveness and updated as needed.

6.0 DEFINITIONS

6.1 Blood - Human blood, human blood components, and products made from human blood.

6.2 Bloodborne Pathogens - Pathogenic microorganisms present in human blood that can cause disease in humans, including, but not limited to, the Hepatitis B virus (HBV) and human immunodeficiency virus (HIV).

6.3 Contamination - The presence or the reasonably anticipated presence of blood or OPIMs on an item or surface.

- 6.4** Decontamination - The use of physical or chemical means to remove, inactivate, or destroy bloodborne pathogens on a surface or item to the point where they are no longer capable of transmitting infectious particles and the surface or item is rendered safe for handling, use, or disposal.
- 6.5** Exposure Incident - Denotes a specific eye, mouth or other mucous membrane, non-intact skin, or parenteral contact with blood or other potentially infectious materials resulting from the performance of an employee's duties. (An incident in which an employee has been exposed to blood or other OPIM.)
- 6.6** Licensed Healthcare Professional - A person whose legally permitted scope of practice allows him or her to independently perform the required activities under the subsection of Hepatitis B Vaccination and Post-Exposure Evaluation and Follow-up, found in this plan.
- 6.7** HBV - Hepatitis B virus.
- 6.8** HIV - Human immunodeficiency virus.
- 6.9** Occupational Exposure - Reasonably anticipated skin, eye, mucous membrane, or parenteral contact with blood or OPIM that may result from the performance of an employee's duties (potential exposure).
- 6.10** Other Potentially Infectious Material (OPIM) - Blood, semen, vaginal secretions, vessel sanitation systems, saliva (if bloody), joint fluids, organs, and other body fluids which may appear to be visibly tainted with blood.
- 6.11** Parenteral – Piercing of mucous membrane or the skin barrier with needle, stick, human bite, cut, or abrasion.
- 6.12** Personal Protection Equipment (PPE) - Specialized clothing worn by an employee for protection against a hazard. General work clothes (pants, shirts, or blouses) not intended to function as protection against a hazard are not considered to be PPE.
- 6.13** Regulated Waste - Liquid or semi-liquid blood or OPIM; contaminated items that would release blood or OPIM in a liquid or semi-liquid state if compressed; items that are caked with dried blood or OPIM and are capable of releasing these materials during handling; contaminated sharps; and pathological and microbiological wastes containing blood or OPIM. Feminine napkins are not considered a regulated waste as long as they are not squeezed to the point that blood would drip or flake out. They are to be treated as infected but are not a regulated waste; therefore, they do not have to be labeled or containerized.
- 6.14** Sharps - Articles that can penetrate the skin, such as needles, scalpels, broken glass, and saw blades.
- 6.15** Source Individual - Any individual, living or dead, whose blood or OPIM may be a source of occupational exposure to the employee.
- 6.16** Universal Precautions - An approach to infection control. According to the concept of universal precautions, human blood, and certain human body fluids are treated as if known to be infectious for HIV, HBV, and other bloodborne pathogens.

1.0 PURPOSE

This procedure establishes Energy Fuels requirements to protect employees and contractors from risk of permanent hearing impairment resulting from exposure to potentially hazardous levels of workplace noise. The procedure is designed to be compliant with the Mine Safety & Health Administration (MSHA) occupational noise standard.

2.0 SCOPE

This procedure is applicable to all employees and contractors who are exposed to noise levels above 85 dBA over an 8-hour period.

3.0 RESPONSIBILITY

- 3.1** Managers shall ensure employees and contractors follow this procedure.
- 3.2** Supervisors shall assist employees, contractors and the Safety Department in identifying noisy areas.
- 3.3** Employees and contractors (personnel) shall identify potential noisy areas and report them to their supervisor, participate in hearing conservation training, wear hearing protection when required.
- 3.4** The Radiation Safety Officer (RSO) or Assistant RSO shall identify personnel and contractors exposed above the action level, facilitate noise level sampling, post signs as appropriate, provide audiometric exams, provide a selection of hearing protection, facilitate training, provide personnel with the opportunity to observe any noise measurements and otherwise maintain the Hearing Conservation Program (HCP).

4.0 OBJECTIVE

- 4.1** The objective of this procedure is to provide guidelines and procedures for limiting noise exposure to all personnel.

5.0 PROCEDURE

5.1 HEARING CONSERVATION

- 5.1.1 Protection against the effects of noise must be provided when sound levels exceed the Action Level (AL) of 85 dBA over an 8-hour Time Weighted Average (TWA).
- 5.1.2 EFR will use all feasible engineering and administrative noise controls to reduce personnel noise exposures to within the Permissible Exposure Limit (PEL) of 90 dBA over an 8-hour TWA without adjustment for the use of hearing protection.
- 5.1.3 If personnel noise exposure exceeds the PEL despite the use of all feasible engineering and administrative controls EFR will implement the Hearing Conservation Program in accordance with MSHA regulations

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RSO		
Plant Manager		

5.2 NOISE MONITORING

- 5.2.1 A baseline sound level survey of noise sources will be conducted in noisy areas either with a sound level meter or personal noise dosimeters.
- 5.2.2 Once baseline noise levels have been established for EFR operations, monitoring shall be repeated whenever a change in production, process, equipment or controls has the potential to increase noise exposures.
- 5.2.3 Each new project will be evaluated by the RSO or Assistant RSO to determine if baseline monitoring is required.
- 5.2.4 EFR will notify, in writing, personnel exposed above the 85 dBA level, of their exposure and of their inclusion in the Hearing Conservation Program as required by MSHA standards.

5.3 HEARING PROTECTION

- 5.3.1 EFR will provide hearing protection to any personnel whose noise exposure equals or exceeds the action level.
- 5.3.2 A choice of hearing protection will be provided, including at least two muff types and two plug types at no cost to personnel.
- 5.3.3 If personnel noise exposure exceeds the dual hearing protection level, both a muff type and a plug type will be provided.

5.4 AUDIOMETRIC TESTING PROGRAM

- 5.4.1 EFR will require and provide at no cost, a baseline and subsequent annual audiogram for personnel that is enrolled in the HCP.
- 5.4.2 The baseline audiogram will be provided within 6 months of enrolling personnel in an HCP, or 12 months if a mobile test van is used.

5.5 TRAINING

- 5.5.1 EFR will provide personnel with specific, noise related training within 30 days of enrollment in the HCP.
- 5.5.2 The training will be repeated at least every 12 months for as long as personnel noise exposure continues to equal or exceed the action level.
- 5.5.3 The training will include instruction that addresses the following:
 - 5.5.3.1 Effects of noise on hearing
 - 5.5.3.2 Purpose and value of wearing hearing protection
 - 5.5.3.3 Various types of hearing protection offered by EFR and the care, fitting, and use of each type.
 - 5.5.3.4 Advantages and disadvantages of the hearing protection offered.
 - 5.5.3.5 General requirements of MSHA's noise rule.
 - 5.5.3.6 EFR and personnel respective tasks in maintaining noise controls.
 - 5.5.3.7 Purpose and value of audiometric testing and a summary of the procedures.

5.6 DOCUMENT AND RECORDKEEPING REQUIREMENTS.

- 5.6.1 EFR will retain the following records as they relate to this HCP:
 - 5.6.1.1 Personnel exposure monitoring
 - 5.6.1.2 Audiometric test measurements and related documentation
 - 5.6.1.3 Training records
- 5.6.2 Records will be retained in accordance with the MSHA Occupational Noise Standard, 30 CFR Part 62.
- 5.6.3 Copies of records required under 30 CFR Part 62 will be provided upon request to personnel, former personnel, or a personnel representative.

6.0 DEFINITIONS & ACRONYMS

- 6.1** Action Level (AL) – An 8-hour time-weighted average exposure of 85 dBA.
- 6.2** dBA – A non-dimensional unit used to express sound levels. It is a logarithmic expression of the ration of a measured quantity to a reference quantity. The dBA designation indicates specific weighting to an A-weighted scale.
- 6.3** Permissible Exposure Limit (PEL) – An 8-hour time-weighted average exposure of 90 dBA.
- 6.4** TWA – Time Weighted Average.

1.0 PURPOSE

The purpose of this procedure is to identify specific instructions for the safe operations of vehicles and mobile equipment.

2.0 SCOPE

This procedure is designed for EFR's employees and contractors (personnel) whose job assignments require them to operate vehicles and mobile equipment.

3.0 RESPONSIBILITY

- 3.1** Managers shall be responsible for implementing the Vehicle and Mobile Equipment Safety Procedure.
- 3.2** Supervisors shall ensure that employees comply with the Vehicle and Mobile Equipment Safety Procedure.
- 3.3** Personnel shall comply with this procedure.
- 3.4** The Safety Department shall develop and maintain the Vehicle and Mobile Equipment Safety Procedure.

4.0 PROCEDURE

4.1 SMALL VEHICLES

- 4.1.1 Only personnel with a valid driver's license shall be authorized to operate company vehicles.
- 4.1.2 The parking brake shall be set whenever a vehicle is parked.
- 4.1.3 Seatbelts shall be worn at all times.
- 4.1.4 Personnel shall not ride in the bed of pickup trucks unless they are provided with seats and seatbelts.
- 4.1.5 Drivers shall not move their vehicle until all riders comply with all safety precautions.
- 4.1.6 Vehicles shall not be allowed to park in active work areas.

4.2 LARGE EQUIPMENT/MOBILE EQUIPMENT

- 4.2.1 Self propelled mobile equipment to be used during a shift shall be inspected by the equipment operator before being placed into operation on that shift.
- 4.2.2 Defects on any equipment that affect safety shall be corrected in a timely manner to prevent the creation of a hazard to persons.
- 4.2.3 When defects make continued operation hazardous to persons, the equipment shall be taken out of service and placed in a designated area for that purpose, or a tag or other effective method of marking the defective items shall be used to prohibit further use until the defects are corrected.
- 4.2.4 Defects on self-propelled mobile equipment affecting safety, which are not corrected immediately, shall be reported to, and recorded by, the Foreman.

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RSO		
Plant Manager		

The records shall be kept at the Mill from the date the defects are recorded, until the defects are corrected. These records must be made available to an authorized representative of the Secretary of Labor (MSHA).

- 4.2.5 Equipment parked on an incline should have the wheels chocked.
- 4.2.6 Personnel are prohibited from riding on loads, fenders, running boards or tailgates of any vehicle, or with any legs or arms dangling over the sides of any vehicle.
- 4.2.7 Personnel shall not back up any vehicle or equipment when the view of the rear is obstructed unless:
 - 4.2.7.1 It is equipped with an operating backup alarm which is audible above the surrounding noise, or
 - 4.2.7.2 An observer signals it is safe to do so, or
 - 4.2.7.3 The driver physically checks the area at the rear of the vehicle.
- 4.2.8 All equipment and vehicles shall be shut down when refueling.
- 4.2.9 Personnel are not allowed to ride on heavy equipment unless a seat, equipped with a seat-belt, is available.
- 4.2.10 Equipment and vehicles are not allowed to be left running without operators or drivers in the vehicle.
- 4.2.11 Raised items such as forklift forks, dozer blades and loader buckets shall be lowered prior to the operator leaving equipment and at shift end.
- 4.2.12 Windows in mobile equipment shall be maintained to provide visibility for safe operation.
- 4.2.13 Operator's cabs of mobile equipment shall:
 - 4.2.13.1 Be free of materials that could created a hazard to persons by impairing the safe operation of the equipment.
 - 4.2.13.2 Not be modified in a manner that obscures visibility necessary for safe operation of the equipment.
- 4.2.14 Roll-over protective structures designed to meet the requirements of the Society of Automotive Engineers publications and seat belts shall be provided on the following equipment:
 - 4.2.14.1 Crawler tractors and crawler loaders.
 - 4.2.14.2 Graders
 - 4.2.14.3 Wheel loaders and wheel tractors.
 - 4.2.14.4 The tractor portion of semi-mounted scrapers, dumpers, water wagons, bottom dump wagons, rear dump wagons, and towed fifth wheel attachments.
 - 4.2.14.5 Skid-steer loaders
 - 4.2.14.6 Agricultural tractors

- 4.2.15 Persons shall not work on top of, under, or on mobile equipment in a raised position until the equipment has been blocked or mechanically secured to prevent it from rolling or falling accidentally.
- 4.2.16 Personnel shall be task trained in accordance with the MSHA Training Plan for operation of mobile equipment. The training shall be given by a competent person experienced in the operation of the equipment.

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1.0 PURPOSE

The purpose of this procedure is to provide specific instructions for safe confined space entry operations.

2.0 SCOPE

This procedure is designed for EFR’s employees and contractors whose job assignments require entering confined spaces.

3.0 OBJECTIVE

3.1 The objective of this procedure is to identify areas of confined space hazards and provide guidelines and procedures for safe confined space entry operations.

4.0 OTHER DOCUMENTS

4.1 APPENDICES

Appendix A – Confined Space Entry Permit Form HS-050A

5.0 RESPONSIBILITY

5.1 Managers and Supervisors shall be responsible for ensuring compliance with the following procedures:

5.1.1 Appropriate selection concerning the use of a company-approved Competent Person for the job planned.

5.1.2 Utilize a Qualified Individual to issue safe for welding and safe for entry certificates.

5.1.3 If an exemption to the procedure and/or work instructions is necessary, they shall approve such request ensuring that the work instructions, deviations, and exemptions are followed.

Any emergency exceptions to this section of the procedure shall be approved by the Radiation Safety Officer (RSO) or his/her designated representative.

5.1.4 Keep trained attendants on site during confined space entry, hot work, or gas-freeing activities.

5.1.5 Ensure that individuals including contractors in the area are aware of the hazards and their responsibility to correct the hazards and emergency procedures.

5.1.6 Upon receipt of the EFR’s Confined Space Entry Permit, sign his/her name to the certificate to give authorization for work to be initiated.

5.1.7 Ensure that the approved instrumentation, Personal Protection Equipment (PPE), and operational equipment are available.

5.1.8 Ensure employees and contract personnel understand how to notify the on-site and off-site responders in the event of an emergency.

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RSO		
Plant Manager		

- 5.1.9 Maintain records of EFR's confined space entry permits for one year.
- 5.1.10 Ensure that entrance openings are properly guarded to prevent an accidental fall.
- 5.2 Entry Attendant ("Safety Watch") personnel shall:
 - 5.2.1 Be assigned for each confined space entry.
 - 5.2.2 Receive training as a confined space attendant.
 - 5.2.3 Maintain and keep accurate account of those workers entering confined spaces.
 - 5.2.4 Perform no other duties that interfere with the attendant's primary duties.
 - 5.2.5 Remain on site at the confined space area throughout the duration of the operation while the space is occupied or until the attendant is relieved properly.
- 5.3 Competent Persons (Entrants) shall be:
 - 5.3.1 Capable of recognizing hazards.
 - 5.3.2 Authorized to stop work, if such an action is warranted, and provide recommendations to supervisors.
 - 5.3.3 Trained as a Competent Person. They must also be trained in EFR's Confined Space Entry Procedure.
 - 5.3.4 Approved as a Competent Person by the Safety Department.
 - 5.3.5 Given medical exams if exposed to carcinogens or highly toxic materials and waste on a routine basis.
 - 5.3.6 Required to complete the EFR's Confined Space Entry Permit, and/or Competent Person log as appropriate.
- 5.4 The Qualified Individual shall:
 - 5.4.1 Have authority to stop work, if such action is warranted, and provide recommendations or requirements for supervision and re-inspection.
 - 5.4.2 Conduct all appropriate atmospheric testing to determine that the confined space is safe for entry.
 - 5.4.3 Ensure the appropriate systems are in place to ensure the confined space has a continuous safe environment.

Any emergency exception to this section of the procedure shall be approved by the RSO or his designated representative.
- 5.5 The Safety Department shall develop and maintain the Confined Space Entry Procedure and maintain a current list of EFR's-approved Competent Persons.
- 5.6 Contractor work in confined spaces
 - 5.6.1 All contractor and subcontractor employees who will enter EFR's equipment or jobsites/facilities to perform work in confined spaces shall be briefed on the hazards, safety rules and emergency procedures concerning those spaces.

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6.0 PROCEDURE

6.1 PERMIT-REQUIRED CONFINED SPACES

- 6.1.1 The confined space shall be evaluated to determine if an entry certificate is required. Spaces that require a permit are:
- 6.1.1.1 Tanks or void spaces of any kind that contain or have contained flammables, combustibles, or other chemicals.
 - 6.1.1.2 Confined spaces where work activity will introduce flammables, combustibles, or other air contaminants, such as welding, painting, and grinding.
 - 6.1.1.3 Confined spaces where there are mechanical hazards, such as machinery which has not been locked or tagged out. A confined space containing equipment that has been locked or tagged is not a permit-required confined space.
 - 6.1.1.4 Storage tanks, silos, process vessels, or bins, except as noted below, adjacent to tanks that contain or have contained flammables, combustible liquids, or other toxic chemicals, shall be permit-required confined spaces.
 - 6.1.1.5 If a space cannot be categorized in the above groups and there is any concern for safety, contact the Safety Department for assistance before entering the space.
 - 6.1.1.6 For spaces that do not require an entry permit, see Section 6.2.
- 6.1.2 A Qualified Individual must be assigned to each permit-required confined space entry and shall prepare the entry permit for that space.
- 6.1.3 A Qualified Individual shall certify permit-required confined spaces as safe for entry. The Qualified Individual shall develop and post an entry permit. A Competent Person may perform the duties of a Qualified Individual when the entry is approved by the RSO or their designated representative.

6.2 NON-PERMIT CONFINED SPACE ENTRY

- 6.2.1 There are many confined spaces where no mechanical or chemical hazard is present. There is, however, the remote possibility that oxygen deficiencies may occur.
- 6.2.2 Before the entrance cover to the confined space is removed, the area around the entrance shall be inspected and all unsafe conditions eliminated.
- 6.2.3 After removal of the entrance cover, the opening, if applicable, shall be guarded by a railing, temporary cover or other temporary barrier that will prevent an accidental fall through the opening, and to protect the employee(s) working in the space from objects that may fall into the space.

6.2.4 Before an employee is allowed to enter the space, the internal atmosphere shall be tested with a calibrated direct-reading instrument for the following in the order given:

- (a) Oxygen content - between 19.5% and 23.5%.
- (b) Flammable gases and vapors - Not more than 10% of the Lower Explosive Limit (LEL).
- (c) Potential toxic air contaminants.

6.2.5 Continuous forced air ventilation from a clean, uncontaminated source shall be maintained during the entry.

6.3 PERMIT-REQUIRED CONFINED SPACE ENTRY

6.3.1 Follow procedure per non-permit-required confined space entry above.

6.3.2 All spaces shall be opened and ventilated via forced air or natural air flow and test for sufficient atmospheric oxygen levels prior to entry.

6.3.3 Forced air ventilation of a confined space shall be maintained for a minimum of five (5) minutes before atmospheric testing is conducted, safe levels are confirmed, and entry is permitted.

6.3.4 Natural ventilation of a confined space shall be maintained for a minimum of thirty (30) minutes before atmospheric testing is conducted and entry is permitted.

6.3.5 Atmospheric testing shall be performed and documented at regular intervals to ensure safe levels of oxygen are maintained.

6.3.6 Respiratory protection shall be made available and worn where required.

6.4 A pre-job safety meeting will be held with all EFR and contractor personnel involved with the permit-required confined space entry.

7.0 RECORDS

7.1 A copy of the entry permit and/or entry records shall be maintained at the jobsite/facility where the confined space entry was made.

7.2 Training records shall be maintained by the Safety Department for three years.

7.3 Inspection records shall be maintained by managers for one year at the jobsite/facility where the confined space entry was made.

8.0 FORMS

8.1 Confined Space Entry Permit

9.0 DEFINITIONS

9.1 Adjacent Space - A space which borders a confined space in any direction, including all points of contact, corners, diagonals, decks, tank tops, and bulkheads.

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9.2 Confined Space - Enclosed space that is large enough that an employee can enter and perform assigned work, has limited means of egress, and is not intended for continuous occupation.

9.2.1 Confined spaces are further classified as permit-required and non-permit required. Air monitoring must be performed to determine if the confined space is a permit or non-permit required confined space. For a permit-required confined space, in addition to the provisions in section 5.1, one or more of the following apply:

9.2.1.1 Flammable gas, vapors, or mist are present at or above 10% of the LEL.

9.2.1.2 The atmospheric oxygen (O₂) concentration is less than 19.5%, or more than 23.5%.

9.2.1.3 Other toxic chemicals are present at or above their Permissible Exposure Limit (PEL).

9.2.1.4 Material that can trap, surround, cover or cause unconsciousness is present.

9.2.2 A non-permit required confined space does not have the conditions listed in section 5.1.1 or 8.2.1. The space is large enough and so configured that an employee can bodily enter and perform assigned work. The space is not designed for continuous occupancy.

Table 1: Types of Confined Spaces and Requirements for Entry

Type of Tank Condition and/or Operations	Entry Permit	Qualified Individual	Competent Person
Tanks with flammables or other chemical hazards.	Yes	Yes (a)	No
Tanks or spaces without flammables, chemical, or mechanical hazards.	No (b)	Yes (c)	No
	No	Yes (d)	Yes
Hot work inside	Yes	Yes (a)	No
Hot work (outside of confined spaces)	Yes	Yes (a)	No

(a) Only qualified individuals can issue an entry or hot work permit.

(b) If a qualified individual is not reasonably available, a company-approved competent person may be used.

- (c) Whether such confined spaces require a certificate depends upon the testing results. If the test results indicate that the space is a certificate required space, a qualified individual should be called in, if possible, to issue the certificate.
- (d) At the direction of the manager or supervisor, these confined spaces shall be opened and "forced air" ventilated, and an entry attendant shall be assigned to the spaces prior to entry. Air monitoring shall be performed by a company-approved competent person prior to entry.

- 9.3** Company-Approved Competent Person (CACP) - A person capable of recognizing and evaluating employee exposure to hazardous substances or unsafe conditions. The individual has satisfactorily completed the confined space entry training class and accompanying examination, and records have been completed for the individual and transmitted to the Safety Department. These competent persons are approved by the RSO.
- 9.4** Cold Work - Any construction, alteration or repairs that do not involve heat, fire, or spark-producing operations.
- 9.5** Dangerous Atmosphere - An atmosphere which may expose employees to the risk of death, incapacitation, impairment of the ability to self-rescue, injury, or acute illness.
- 9.6** Entry - An action by which a person passes through an opening into a space. Entry is considered to have occurred as soon as any part of the entrant's body breaks the plane of an opening into the space.
- 9.7** Entry with Restrictions - Entry is permitted only if engineering controls, PPE, clothing, and time limitations are specified on the permit by the Qualified Individual (hot and cold work).
- 9.8** Hazardous Substance - A substance which, by reason of being explosive, flammable, poisonous, corrosive, oxidizing, irritating or otherwise harmful, is likely to cause injury.
- 9.9** Hot Work - Any work which may produce or require flame, spark, or sufficient heat to cause auto-ignition. Examples include burning, welding, riveting, cutting, drilling, sanding, abrasive blasting, and space heating. Hot work entry permits are required.
- 9.10** Lower Explosive Limit (LEL) - The minimum vapor concentration of a combustible gas or vapor in air which will ignite if an ignition source is present. The term Minimum Explosive Concentration (MEC) is used for dusts.
- 9.11** Not Safe for Workers - Denotes a space where an employee may not enter because conditions do not meet safe for workers conditions.
- 9.12** Qualified Tester - An employee who inspects and tests permit-required confined spaces prior to entry.
- 9.13** Safe for Workers - Denotes a space meeting the following requirements:
 - 9.13.1 The oxygen content of the atmosphere is between 19.5% and 23.5%.
 - 9.13.2 The concentration of flammable vapors is below 10% of the LEL.
 - 9.13.3 Toxic materials in the atmosphere are below their respective PEL.

9.13.4 Any residues or work materials will not produce uncontrolled releases of toxic materials under existing conditions while maintained as directed.

9.14 Safe for Hot Work - Denotes a space in which the following conditions are met:

9.14.1 The oxygen content in the atmosphere does not exceed 23.5% by volume.

9.14.2 The concentration of flammable vapors in the atmosphere is less than 10% of the LEL.

9.14.3 Any residue in the space is not capable of producing an oxygen concentration in the atmosphere greater than 23.5% or a flammable vapor concentration greater than 10% of the LEL under existing conditions in the presence of hot work and as maintained by the Entry Certificate/Permit.

9.14.4 All adjacent spaces have been cleaned, rendered inert, or treated sufficiently to prevent the spread of fire.

CONFINED SPACE ENTRY PERMIT
(to be filled out by Qualified Individual)

Location: _____	Date: _____ Time In: _____
Tank/Tank Contents: _____	Time Out: _____
Type of Work: _____	Permit Expires: _____

Instrument Used: _____ Type: _____ ID #: _____ Calibration Date: _____

Calibration Results: _____

O₂: _____ Combustible Gas: _____ CO: _____ H₂S: _____

Test Gas/Vapor	Tank 1	Tank 2	Tank 3	Tank 4	Tank 5	Tank 6	Tank 7	Tank 8
Oxygen (< 19.5% or > 23.5%)								
Flammables (> 10% LEL) *								
Benzene (> 1 ppm) *								
Total Hydrocarbon (> 100 ppm) *								
H ₂ S (> 10 ppm) *								
Carbon Monoxide (> 50 ppm) *								
Other Toxic								

* If monitoring results exceed values noted, appropriate respiratory protection shall be used.

SPECIAL REQUIREMENTS

Required?	Yes	No	Required?	Yes	No
Ventilation			Explosion Proof Equipment		
Lock-Out/Tag-Out			Fire Extinguisher (Type: _____)		
Rescuers Trained in CPR/First Aid			Communication Equipment		
Lines Broken, Capped, or Blanked			Lighting		
Chemical/Splash Suits			SCBAs/Airlines		
Eye/Face Protection			Area Posting/Security		
Air Purifying Respirators			Rescue Personnel		
Harness and Lifeline			Qualified Individual Certificate		
First Aid Kit with Oxygen					

Other: _____

Qualified Person's Signature: _____ Date: _____ Time: _____

PERSONNEL (This section to be filled out and approved by supervisor)

Attendant: _____

Authorized Entrants: _____

Rescue: _____

Supervisor (all above conditions satisfied): _____ Date: _____

Safety and Health Manager (if required): _____ Date: _____

Send copy to Safety Department,

1.0 PURPOSE

The purpose of this procedure is to identify specific instructions for safe operations around electrical hazards and ensure that employees and contractors (personnel) are qualified as required by federal and state agencies.

2.0 SCOPE

This procedure is designed for EFR and contractor personnel whose job assignments expose them to hazards associated with electricity.

3.0 RESPONSIBILITY

- 3.1 Managers shall be responsible for implementing the Electrical Safety Procedure.
- 3.2 Supervisors shall ensure that personnel comply with the Electrical Safety Procedure.
- 3.3 Personnel shall comply with this procedure.
- 3.4 The Safety Department shall develop and maintain the Electrical Safety Procedure and conduct hazard assessments of the work areas at each EFR facility for exposure determination.

4.0 PROCEDURE

4.1 PROTECTION OF PERSONNEL

- 4.1.1 Prior to starting work, all energized circuits shall be located. Proper warning signs shall be posted where such circuits exist. The personnel working in those immediate areas shall be advised of the locations, the hazards involved and the protective measures that need to be taken.
- 4.1.2 No personnel shall work adjacent to any part of an electric power circuit that they may come in contact with during the course of their work unless the personnel is protected against electric shock by de-energizing the circuit and grounding it or by guarding it by effective insulation or other means. In work areas where the exact location of underground electric power is unknown, workers using jack-hammers, bars or other hand tools which may contact a line shall be provided with insulated protective gloves.
- 4.1.3 Only qualified electricians shall be permitted to install, repair or remove electrical wiring or equipment.
- 4.1.4 Dry wooden platforms, insulating mats, or other electrically nonconductive material shall be kept in place at all switchboards and power control switches where a shock hazard exists. However, metal plates on which a person may normally stand and which are kept at the same potential as the grounded, metal, non-current carrying parts of the power switches to be operated may be used.
- 4.1.5 Before an extension cord, drop light, or any other piece of electrical equipment is plugged in the plug shall be examined to ensure that the wires are not frayed where they are connected.

APPROVALS	Signature	Date
RSO		
Plant Manager		

- 4.1.6 Personnel should run their hand along the cord to look for sharp kinks and ragged insulation, and examine the cord at the point where it enters the socket or tool to see that it isn't frayed and is securely fastened.
- 4.1.7 As soon as the cord is plugged in, personnel shall ensure that it will be protected while it is being used. If a cord has to run across an aisle way, string it overhead if possible. If it must run along the floor, it shall be protected so it cannot be run over or jerked loose, become a tripping hazard, or be cut by metal framing material.
- 4.1.8 If a problems arises with a piece of electrical equipment while in use—if personnel get shocked, if it becomes damaged, or if the cord comes loose—the equipment shall be turned off and the problem reported at once.

4.2 PASSAGEWAYS

- 4.2.1 Suitable barriers shall be provided to ensure that work space for electrical equipment will not be used as a passageway when energized parts of electrical equipment are exposed.

4.3 WORK SPACE AROUND EQUIPMENT

- 4.3.1 Sufficient space shall be provided and maintained in the area of electrical equipment to permit ready and safe operation and maintenance of such equipment.
- 4.3.2 When parts are exposed, the minimum clearance for the work space shall not be less than 6-1/4 feet high nor less than a radius of 3 feet wide and there shall be a clearance sufficient to permit at least 90 degree opening of all doors or hinged panels. All working clearances shall be maintained in accordance with Article 110-16, National Electrical Code and NFPA 70-1980.

4.4 TEMPORARY WIRING AND LIGHTING

- 4.4.1 All temporary wiring shall be effectively grounded in accordance with the National Electrical Code, NFPA No. 70-1980, Articles 300-23 and 310.
- 4.4.2 Temporary lights shall be equipped with guards and or lenses to prevent accidental contact with the bulb.
- 4.4.3 Temporary lights shall be equipped with heavy duty electric cords with connection and insulation maintained in safe condition. Temporary lights shall not be suspended by their electric cords unless cords and lights are designed for this means of suspension. Splices shall have insulation equal to that of the cable.
- 4.4.4 Cords shall be kept clear of working spaces and walkways or other locations in which they are readily exposed to damage.
- 4.4.5 Portable electric lighting used in moist and/or other hazardous locations, such as drums, tanks and vessels, shall be operated at a maximum of 12 volts.

4.4.6 Temporary light cords must not be used as a power source for operations other than temporary lighting.

4.4.7 All temporary cords must be kept off the ground to protect them from damage and prevent tripping hazards.

4.5 FLEXIBLE CABLE AND EXTENSION CORDS

4.5.1 Receptacles for attachment plugs shall be of approved, concealed contact type with a contact for extending ground continuity and shall be so designed and constructed that the plug may be pulled out without leaving any live parts exposed to accidental contact.

4.5.2 Where different voltages, frequencies or types of current (a.c. or d.c.) are to be supplied by portable cords, receptacles shall be of such design that attachment plugs used on such circuits are not interchangeable.

4.5.3 Attachment plugs or other connectors supplying equipment at more than 300 volts shall be of the skirted type or otherwise so designed that arcs will be confined.

4.5.4 Attachment plugs for use in work areas shall be so constructed that they will endure rough use and be equipped with a suitable cord grip to prevent strain on the terminal screws.

4.5.5 Flexible cords shall be used only in continuous lengths without splices, except where suitable molded or vulcanized splices used are properly made and the insulation equal to the cable being spliced and wire connections soldered.

4.5.6 Trailing cables shall be protected from damage.

4.5.7 Splices in trailing cable shall be mechanically strong components and insulated to retain the mechanical and dielectric strength of the original cable.

4.5.8 Cable passing through work areas shall be covered or elevated to protect it from damage which would create a hazard to personnel.

4.5.9 Portable handlamps shall be of the molded composition or other type approved for the purpose. Brass-shell, paper-lined lampholders shall not be used. Handlamps shall be equipped with a handle and a substantial guard over the bulb and attached to the lampholder or the handle.

4.5.10 Worn or frayed electric cables shall not be used.

4.5.11 Extension cords used with portable electric tools and appliances shall be of the three-wire type.

4.5.12 Extension cords shall be protected against potential damages that may be caused by traffic, sharp corners, projections and pinching in doors or elsewhere.

4.5.13 Extension cords shall not be fastened with staples, hung from nails or suspended by wire.

4.6 OVERCURRENT PROTECTION

- 4.6.1 Overcurrent protection shall be provided by fuses or circuit breakers for each feeder and branch circuit and shall be based on the current-carrying capacity of the conductors supplied and the power load being used.
- 4.6.2 No overcurrent device shall be placed in any permanently grounded conductor, except where the overcurrent device simultaneously opens all conductors of the circuit or for motor running protection.
- 4.6.3 When fuses are installed or removed with one or both terminals energized, special tools insulated for the voltage shall be used.

4.7 SWITCHES, CIRCUIT BREAKERS AND DISCONNECTING MEANS

- 4.7.1 Each disconnecting means for motors and appliances, and each service feeder or branch circuit at the point where it originates shall be legibly marked to indicate its purpose unless located and arranged so the purpose is evident.
- 4.7.2 Disconnection means shall be located or shielded so that personnel will not be injured.
- 4.7.3 Boxes for disconnecting means shall be securely and rigidly fastened to the surface upon which they are mounted and fitted with covers.
- 4.7.4 Boxes and disconnecting means installed in a damp or wet location shall be waterproof to the extent that water does not enter or accumulate.

4.8 TRANSFORMERS

- 4.8.1 Energized transformers over 150 volts to ground shall be provided with enclosures. Enclosures made of metal shall be grounded.
- 4.8.2 Entrances to such locations shall be kept locked.
- 4.8.3 Signs indicating danger and prohibiting unauthorized access shall be displayed at entrances.

4.9 CRANES: GENERAL REQUIREMENTS

- 4.9.1 Except where electrical distribution and transmission lines have been de-energized and visibly grounded at point of work or where insulating barriers not a part of or an attachment to the equipment or machinery have been erected to prevent physical contact with the lines, equipment or machines shall be operated proximate to power lines only in accordance with the following:
 - 4.9.1.1 For lines rated 50 kV or below, minimum clearance between the lines and any part of the crane or load shall be 10 feet;
 - 4.9.1.2 For lines rated over 50 kV, minimum clearance between the lines and any part of the crane or load shall be 10 feet plus 0.4 inch for each 1 kV over 50kV or use twice the length of the line insulator but never less than 10 feet;
 - 4.9.1.3 In transit with no load and boom lowered, the equipment clearance shall be a minimum of 4 feet for voltages less than 50

kV and 10 feet for voltages over 50 kV up to and including 345 kV and 16 feet for voltages up to and including 750 kV;

- 4.9.2 A person shall be designated to observe clearance of the equipment and give timely warning for all operations where it is difficult for the operator to maintain the desired clearance by visual means;
- 4.9.3 Cage-type boom guards, insulating links or proximity warning devices may be used on cranes, but the use of such devices shall not alter the requirements of any other regulation of this part even if such device is required by law or regulation;
- 4.9.4 Any overhead wire shall be considered to be an energized line unless and until the person owning such line or the electrical utility authorities indicate that it is not an energized line and has been visibly grounded;
- 4.9.5 Prior to work near transmitter towers where an electrical charge can be induced in the equipment or materials being handled, the transmitter shall be de-energized or tests shall be made to determine if electrical charge is induced on the crane. The following precautions shall be taken when necessary to dissipate induced voltages:
 - 4.9.5.1 The equipment shall be provided with an electrical ground directly to the upper rotating structure supporting the boom; and,
 - 4.9.5.2 Ground jumper cables shall be attached to materials being handled by boom equipment when electrical charge is induced while working near energized transmitters. Crews shall be provided with nonconductive poles having large alligator slips or other similar protection to attach the boom.

4.10 *LOAD RATING*

- 4.10.1 In existing installations, no change in circuit protection shall be made to increase the load in excess of the load rating of the circuit wiring as specified in National Electrical Code, Article 310.

4.11 *GROUNDING*

- 4.11.1 Portable and/or Cord and Plug Connected Equipment
 - 4.11.1.1 The noncurrent-carrying metal parts of portable and/or plug-connected equipment shall be grounded.
 - 4.11.1.2 Portable tools and appliances protected by an approved system of double insulation or its equivalent need not be grounded. Where such an approved system is employed, the equipment shall be distinctively marked.
- 4.11.2 Fixed Equipment
 - 4.11.2.1 Exposed noncurrent-carrying metal parts of fixed electrical equipment including motors, generators, frames and tracks of electrically operated cranes, electrically driven machinery, etc. shall be grounded.
- 4.11.3 Effective Grounding

4.11.3.1 The path from circuits, equipment, structures and conduit or enclosures to ground shall be permanent and continuous, have ample carrying capacity to conduct safely the currents liable to be imposed on it and have the impedance sufficiently low to limit the potential above ground and to result in the operation of the over current devices in the circuit.

NOTE: MSHA requires continuity and resistance testing of grounding systems immediately after installation, repair or modification and annually thereafter. A record of the most recent test must be made available.

4.11.4 Ground Resistance

4.11.4.1 Driven rod electrodes shall, be tested for and, have a resistance to ground not to exceed 25 ohms. Where resistance is not as low as 25 ohms, two or more electrodes connected in parallel shall be used.

4.11.5 Ground Testing

4.11.5.1 Use one of two methods in testing for proper ground:

1. On proper cords, use a 3-light test service check for proper functions.
2. On grounded power equipment, use an ohmmeter to check the continuity between the ground plug and the equipment casing.

NOTE: Double-insulated equipment does not have a ground connection so it can only receive a visual inspection for cord damage.

4.11.6 Cord Insulation

4.11.6.1 If cord insulation is damaged, repair or replace the cord. The cord end and the portion of the cord where it enters the power equipment are the two most likely places for damage. If a cord is damaged in the center, it is illegal to splice it. Make it into two shorter cords or throw it away. Cord insulation must be equal to or greater than manufacturer's specifications.

1.0 PURPOSE

The purpose of this procedure is to identify specific instructions for safe operations in and around excavations and trenches and ensure that employees and contractors are aware of the hazards associated with excavations and trenches.

2.0 SCOPE

This procedure is designed for EFR's employees and contractors whose job assignments require them to be in or near excavations and trenches.

3.0 RESPONSIBILITY

- 3.1 Managers shall be responsible for implementing the Excavation and Trenching Procedure.
- 3.2 Supervisors shall ensure that employees comply with the Excavation and Trenching Procedure.
- 3.3 Employees and contractors (personnel) shall comply with this procedure.
- 3.4 The Safety Department shall develop and maintain the Excavation and Trenching Procedure.

4.0 PROCEDURE

4.1 SPECIFIC EXCAVATION REQUIREMENTS

- 4.1.1 Prior to opening and excavation, efforts shall be made to determine whether underground installations such as sewer, telephone, water, fuel, electric lines, etc. are present, and where they are actually located.
- 4.1.2 The walls and faces of all excavations in which personnel are exposed to danger from moving ground shall be guarded by a shoring system, sloping of the ground, or some other equivalent means.
- 4.1.3 The determination of the angle of repose and design of the supporting system shall be based on careful evaluation of pertinent factors such as: depth of cut, material properties, and possible variation in the water content of the materials from exposure to air, sun, water, or freezing.
- 4.1.4 All slopes shall be excavated to at least the angle of repose except for areas where solid rock allows for line drilling or pre-splitting.
- 4.1.5 The angle of repose shall be flattened when an excavation has water conditions, silty materials, loose boulders, and areas where erosion, deep frost action and slide planes appear.
- 4.1.6 In excavations which personnel may be required to enter, excavated or other materials shall be effectively stored and retained at least 2 feet or more from the edge of the excavation.
- 4.1.7 Banks more than 5 feet high shall be shored, sloped for stability, or some other equivalent means of protection shall be provided.
- 4.1.8 When personnel are required to be in trenches 5 feet deep or more, an adequate means of exit, such as a ladder or steps, shall be provided and located so as to require no more than 25 feet of lateral travel.

APPROVALS	<i>Signature</i>	<i>Date</i>
RSO		
Plant Manager		

4.2 INSPECTIONS

- 4.2.1 Daily inspections of excavations and trenches shall be made by the Competent Person. If evidence of possible cave-ins or slides is apparent, all work in the excavation or trench shall cease until the necessary precautions have been taken to safeguard the employee. In addition, all open trenches require high visibility perimeter flagging.
- 4.2.2 All excavations and trenches shall be inspected by the Competent Person after every rainstorm or other hazard-increasing occurrence and the protection against slides and cave-ins shall be increased if necessary.

4.3 UNDERGROUND EXCAVATION AND TRENCHING PROCEDURES

- 4.3.1 Prior to excavating anywhere on our jobsite, including areas outside the fence line and in the parking lot, a drawing detailing the proposed excavation route must be submitted to the Manager in charge.
- 4.3.2 The Manager will review and locate all underground utilities on the proposed drawing, make final approval and sign off.
- 4.3.3 Any changes in excavation routing must be approved and signed off by the Manager prior to work commencing.
- 4.3.4 A copy of the approved drawing must be reviewed with and in the possession of the operator actually performing the work.
- 4.3.5 If the excavation is constructed by a contractor, as-built drawings locating all newly installed piping and utilities will be submitted to the Manager once the excavation and installation is complete.

1.0 PURPOSE

The purpose of this procedure is to provide specific instructions for the use of fall protection, and to ensure that affected employees and contractors are trained and made aware of the safety provisions which are required by federal and state agencies.

2.0 SCOPE

This procedure is designed for EFR employees and contractors whose job assignments expose them to fall hazards above six feet.

3.0 RESPONSIBILITY

- 3.1 EFR shall be responsible for providing fall protection equipment.
- 3.2 Managers shall be responsible for ensuring compliance with this procedure.
- 3.3 Supervisors shall ensure that employees comply with this procedure.
- 3.4 Employees and contractors (personnel) shall:
 - 3.4.1 Follow the Fall Protection Procedure.
 - 3.4.2 Wear the Personal Protection Equipment (PPE) assigned to them.
 - 3.4.3 Ensure that their fall protection equipment is in safe operating condition.
- 3.5 The Safety Department shall develop and maintain the Fall Protection Procedure.

4.0 OBJECTIVE

The objective of this procedure is to identify guidelines and procedures for safe operations which involve the risk of employees falling more than 6 feet.

5.0 PROCEDURE

5.1 *SITE-SPECIFIC FALL PROTECTION WORK PLAN*

5.1.1 The supervisor and personnel that participate in activities where a fall hazard of 6 feet or more exists shall perform a Task Hazard Analysis before commencing work in a work area. The fall protection work plan shall be discussed for each task and documented on the Task Hazard Analysis form. If possible, the supervisor shall review and approve fall restraint and anchor points with personnel.

5.2 Personnel traveling or working in an elevated area wherever a fall exposure exists shall make use of fall protection by securing their safety lanyard whenever feasible to an available substantial anchoring point.

5.3 *ANCHOR POINTS*

- 5.3.1 Anchor points shall be selected based on force and load requirements.
- 5.3.2 The use of anchor points shall be discussed during the safety meeting.
- 5.3.3 The selection of the anchorage point shall reduce free fall to the shortest distance possible (a maximum of 6 feet).
- 5.3.4 Anchor points may be the equipment structure in some cases.
- 5.3.5 Guardrails and railings shall be used only as anchor points if they have been designated as such.

APPROVALS	Signature	Date
RSO		
Plant Manager		

5.4 WALKING AND WORKING SURFACES

5.4.1 Personnel on a walking/working surface six feet or more above lower levels shall be protected from falling by a guardrail system (a safety net system or personal fall arrest/restraint system may also be used), whenever feasible.

5.5 ACCESS AND EGRESS WITH LADDERS

5.5.1 A body harness and restraint system shall be used when climbing ladders greater than 25 feet in height, unless the ladder is enclosed with a protective case.

5.6 FALL PROTECTION EQUIPMENT

5.6.1 Personal fall protection devices shall meet ANSI requirements.

5.6.2 Full body harnesses shall be used for fall arrest purposes and fall restraint.

5.6.3 Fall protection equipment shall be inspected prior to use. These inspections shall include visually observing that the load stitches are intact and belts and lanyards are not deteriorated or frayed. Any equipment found defective shall be removed from service.

5.7 ELEVATED PLATFORMS

5.7.1 Safety harness and lanyard will be the approved manner of fall protection while on any elevated platform.

5.7.2 All anchorage points will meet the 5000 lb. rating as required.

5.7.3 All anchorage points will have the approval of EFR Management or Safety.

6.0 DEFINITIONS

6.1 Anchorage - A secure point of attachment for lifelines, lanyards, or deceleration devices. The anchorage point strength for fall arrest shall be capable of supporting 5000 pounds. The anchorage point strength for fall restraint shall be capable of supporting four times the intended load.

6.2 Body Harness - Straps which may be secured about the employee in a manner that will distribute the fall arrest forces over at least the thighs, pelvis, waist, chest, and shoulders with means for attaching them to other components of a personal fall arrest system.

6.3 Connector - A device which is used to couple (connect) parts of the personal fall arrest system and positioning device systems together. It may be an independent component of the system, such as a carabineer, or it may be an integral component of part of the system (such as a buckle or D-ring sewn into a body belt or body harness, or a snap hook spliced or sewn to a lanyard or self retraction lanyard).

6.4 Free Fall - The act of falling before a personal fall arrest system begins to apply force to arrest the fall.

6.5 Guardrail System - A barrier erected to prevent employees from falling to lower levels.

- 6.6** Infeasible - Impossible to perform the work using a conventional fall protection system (i.e. guardrail system, safety net system, or personal fall arrest system) or technologically impossible to use any one of these systems to provide fall protection.
- 6.7** Lanyard - A flexible line of rope, wire rope, or strap which generally has a connector at each end for connecting the body belt or harness to a deceleration device, lifeline, or anchor point.
- 6.8** Personal Fall Arrest System - A system used to arrest an employee in a fall from a working level. It consists of an anchorage, connectors, and a body harness and may include a lanyard(s), deceleration device, lifeline, or suitable combinations of these.
- 6.9** Personal Fall Restraint System - A system used to prevent an employee from falling. It consists of anchorages, connectors, body belt/harness. It may include lanyards, lifelines, and rope-grabs designed for the purpose.
- 6.10** Self-Retracting Lifeline/Lanyard - A deceleration device containing a drum-wound line which can be slowly extracted from, or retracted onto, the drum under slight tension during normal employee movement, and which, after onset of a fall, automatically locks the drum and arrests the fall.
- 6.11** Work Area - That portion of a walking or working surface where job duties are being performed.
- 6.12** Walking or Working Surface - Any surface, whether horizontal or vertical, on which an employee walks or works, including, but not limited to, floors, roofs, ramps, bridges, tanks, silos, but not including ladders, vehicles, or trailers, on which employees must be located in order to perform their job duties.

Energy Fuels Resources Piñon Ridge Mill Montrose County, Colorado	FLAMMABLE MATERIALS STORAGE PROCEDURE	Number: HS-090 Page: 1 of 5 Revision: 0 Date: 10/07/09
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1.0 PURPOSE

The purpose of this procedure is to provide specific instructions for the safe storage of flammable or combustible materials as required by federal and state agencies.

2.0 SCOPE

This procedure is designed for EFR employees and contractors whose job assignments involve handling, using, and storing flammable materials.

3.0 RESPONSIBILITY

- 3.1 Managers shall ensure employees and contractors (personnel) follow this procedure.
- 3.2 Supervisors shall ensure that flammable materials are stored in a safe manner.
- 3.3 Personnel shall comply with this procedure.
- 3.4 The Safety Department shall develop and maintain the Flammable Materials Storage Procedure.

4.0 OBJECTIVE

The objective of this procedure is to provide guidelines and procedures for the safe storage of flammable material.

5.0 PROCEDURE

5.1 CONTAINERS

- 5.1.1 Flammable or combustible liquids shall be stored in approved containers and portable tanks.
 - 5.1.1.1 Small quantities of flammable liquids drawn from storage shall be kept in safety cans labeled to indicate contents.
- 5.1.2 Each portable tank shall be provided with one or more devices installed in the top with sufficient emergency venting capacity to limit internal pressure under fire exposure conditions to 10 psig, or 30% of the bursting pressure of the tank, whichever is greater.
- 5.1.3 Flammable and combustible liquid containers shall be in accordance with Table 1, except that glass or plastic containers of no more than one gallon capacity may be used for certain Class IA or IB flammable liquids specified in 29 CFR 1910.106.

APPROVALS	<i>Signature</i>	<i>Date</i>
RSO		
Plant Manager		

Table 1: Maximum Allowable Size of Containers and Portable Tanks

Container Type	Flammable Liquids			Combustible Liquids	
	Class IA	Class IB	Class IC	Class II	Class III
Glass or Approved Plastic	1 pt.	1 qt.	1 gal.	1 gal.	1 gal.
Metal (Other Than DOT Drums)	1 gal.	5 gal.	5 gal.	5 gal.	5 gal.
Safety Cans	2 gal.	5 gal.	5 gal.	5 gal.	5 gal.
Metal Drums (DOT Specifications)	60 gal.	60 gal.	60 gal.	60 gal.	60 gal.
Approved Portable Tanks	660 gal.	660 gal.	660 gal.	660 gal.	660 gal.

5.2 FLAMMABLE MATERIAL STORAGE LOCKERS AND CABINETS

5.2.1 Quantities of flammable and combustible liquids in excess of 25 gallons shall be stored in an acceptable or approved cabinet meeting the following requirements:

5.2.1.1 Acceptable wood cabinets shall be constructed in the following manner:

5.2.1.1.1 The bottom, sides, and top shall be constructed of an approved grade of plywood at least one inch in thickness, which shall not break down or delaminate under standard fire test conditions.

5.2.1.1.2 Joints shall be rabbeted and fastened in two directions with flathead wood screws.

5.2.1.1.3 When more than one door is used, there shall be a rabbeted overlap of not less than one inch.

5.2.1.1.4 Steel hinges shall be mounted in such a manner as not to lose their holding capacity due to loosening or burning out of the screws when subjected to the fire test.

5.2.1.1.5 Cabinets shall be painted inside with a fire retardant paint.

5.2.1.2 Approved metal cabinets shall be constructed in the following manner:

5.2.1.2.1 The bottom, top, door, and sides of the cabinet shall be at least No. 18 gage sheet iron and double walled with a one and one-half-inch air space.

5.2.1.2.2 Joints shall be riveted, welded, or made tight by some equally effective means.

5.2.1.2.3 The door shall have a three-point lock.

5.2.1.2.4 The door sill shall be raised at least two inches above the bottom of the cabinet.

5.2.1.3 Storage cabinets shall be designed and constructed to limit the internal temperature to not more than 325°F.

5.2.1.4 Labels or signs with the appropriate warning such as “DANGER FLAMMABLE MATERIALS-NO SMOKING OR OPEN FLAMES” shall be adhered to flammable material storage lockers and cabinets.

5.2.2 Not more than 60 gallons of flammable (Class I or Class II) liquids, nor more than 120 gallons of Combustible (Class III) liquids may be stored in a storage cabinet.

NOTE: Quantities exceeding these amounts shall be stored in an inside storage room.

5.2.3 Open containers other than spray cans shall be stored in an approved flammable material storage locker.

5.3 STORAGE INSIDE BUILDINGS

5.3.1 Flammable or combustible liquids shall not be stored so as to limit use of exits, stairways, or areas normally used for the safe egress of people.

5.3.2 Storage of flammable or combustible liquids shall be prohibited in occupied offices except that which is required for maintenance and operation of building and operation of equipment.

5.3.2.1 Such storage shall be kept:

5.3.2.1.1 In closed metal containers stored in a storage cabinet.

5.3.2.1.2 In safety cans.

5.3.2.1.3 In an inside storage room not having a door that opens into the portion of the building used by the public.

5.4 MAXIMUM STORAGE

5.4.1 A maximum of 1,100 gallons of flammable or combustible liquids may be adjacent to buildings located on the same premises and under the same management.

5.4.2 If the quantity stored exceeds 1,100 gallons, a minimum distance of 10 feet between buildings and the nearest container of flammable or combustible liquid shall be maintained.

5.5 SPILL CONTAINMENT

- 5.5.1 The storage area shall be graded to divert possible spills away from buildings or other exposures or shall have containment for the entire capacity of the largest tank.
- 5.5.2 When curbs are used, provisions shall be made for draining ground or rain water accumulations or flammable or combustible liquid spills.
- 5.5.3 Drains shall terminate at a safe location and shall be accessible in the event of fire.

5.6 SECURITY

- 5.6.1 The storage area shall be protected against tampering or trespassers where necessary.
- 5.6.2 The storage area shall be kept free of weeds, debris, and other combustible material not necessary to storage.

5.7 FIRE CONTROL

- 5.7.1 Suitable fire control devices, such as a small hose or portable fire extinguishers, shall be available at locations as required where flammable or combustible liquids are stored.

5.8 Open flames and smoking shall not be permitted in flammable or combustible liquid storage areas and the areas shall be posted with appropriate signage.

5.9 The quantity of unopened liquid that may be located outside of an inside storage room or storage cabinet in a building or in any one fire area of a building shall not exceed:

- 5.9.1 25 gallons of Class IA liquids in containers
- 5.9.2 120 gallons of Class IB, IC, II, or III liquids in containers
- 5.9.3 660 gallons of Class IB, IC, II, or III liquids in a single portable tank

5.10 The amount of material in or around a flammable material storage area shall meet local fire codes.

5.11 Training shall be given to affected employees.

6.0 RECORDS

Training records shall be maintained by the Safety Department for three years.

7.0 DEFINITIONS

7.1 FLAMMABLE LIQUID CLASSES

- 7.1.1 Class IA - Liquids having a Flash Point below 73° and a Boiling Point below 100° F.
- 7.1.2 Class IB - Liquids having a Flash Point below 73° F and a Boiling Point at or above 100° F.
- 7.1.3 Class IC - Liquids having a Flash Point at or above 73° F and below 100° F.

7.2 ***COMBUSTIBLE LIQUID CLASSES***

7.2.1 Class II - Liquids having a Flash Point between 100° and 139° F

7.2.2 Class IIIA - Liquids having a Flash Point between 140° and 199° F.

7.2.3 Class IIIB - Liquids having a Flash Point of 200° F or above.

7.3 Flashpoint - The lowest temperature of a flammable liquid at which it can form an ignitable mixture with air and produce a flame when a source of ignition is present.

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1.0 PURPOSE

The purpose of this procedure is to provide specific instructions for the safe use and care of ladders and scaffolding.

2.0 SCOPE

This procedure is designed for EFR employees and contractors whose job assignments require the use of a ladder and/or scaffolding.

3.0 RESPONSIBILITY

- 3.1 Managers shall be responsible for implementing the Ladder and Scaffolding Safety Procedure.
- 3.2 Supervisors shall ensure that ladders and scaffolds are used in a safe manner.
- 3.3 Employees and contractors (personnel) shall ensure the Ladder and Scaffolding Safety Procedure is followed.
- 3.4 The Safety Department shall develop and maintain the Ladder and Scaffolding Safety Procedure.

4.0 OBJECTIVE

The objective of this program is to provide guidelines and procedures for the safe use and maintenance of ladders and scaffolding.

5.0 PROCEDURE

5.1 PROPER USE OF LADDERS

- 5.1.1 Ladders shall be inspected before each use. If a ladder is broken, cracked, or defective in any way, it shall be tagged for disposal immediately and removed from the work area.
- 5.1.2 Ladders shall be secured at the top or bottom to prevent slippage. Safety shoes shall be placed on ladders.
- 5.1.3 Portable ladders shall never be used horizontally as substitutes for scaffold planks, runways, or any other service for which they have not been designed.
- 5.1.4 When a task can only be done while standing on a portable ladder, the length of the ladder shall be such that the worker stands on a rung no higher than the fourth from the top. The ladder shall also be secured.
- 5.1.5 Unless suitable barricades have been erected, ladders shall not be set up in passageways, doorways, driveways, or other locations where they can be struck or displaced by persons or vehicles using the access route.
- 5.1.6 Only one person at a time shall be allowed on a single-width ladder.
- 5.1.7 Ladders shall not be placed against flexible or movable surfaces.

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- 5.1.8 Three-point contact shall be maintained when climbing up or down a ladder. That means two hands and one foot or two feet and one hand shall be on the ladder at all times. This is especially important when getting on or off a ladder at heights.
- 5.1.9 When working from a ladder, the center of gravity shall be kept between the side rails. A person's center of gravity is approximately in the center of the body at belt height. The location of the center of gravity can shift when reaching out to either side of a ladder, especially with material, tools, or equipment in the hands. As the body's center of gravity and hand-held objects move beyond the side rails, the ladder tends toward instability.
- 5.1.10 Hands shall be used only for climbing ladders. Tools, equipment, and materials shall be placed in a container and raised or lowered by rope, if necessary.
- 5.1.11 Workers shall not straddle the space between a ladder and another object.
- 5.1.12 Ladders shall be placed on secure footings.
- 5.1.13 Ladder shall not be rested on any of its rungs. Ladders shall rest on their side rails.
- 5.1.14 Personnel shall watch for overhead power lines before attempting to erect any ladder.
- 5.1.15 Personnel will only ascend/descend ladders while facing the ladder and holding the side rails with both hands.
- 5.1.16 Single portable ladders over 30 feet in length shall not be used.
- 5.1.17 All ladders, except stepladders, must be tied off or secured for stability.

5.2 STRAIGHT LADDERS

- 5.2.1 When a straight ladder is used for access from one work level to another, the side rails shall extend a minimum of three feet above the landing.
- 5.2.2 The base of straight ladders should be placed at a one-to-four ratio from the vertical surface.
- 5.2.3 Before setting up straight ladders, the area shall be checked for overhead power lines.
- 5.2.4 Straight ladders shall be used only for their intended purpose.

5.3 STEP LADDERS

- 5.3.1 The top step of ordinary types of step ladders shall not be used as a step.
- 5.3.2 When working from a step ladder over five feet high, workers shall not stand on a step higher than the third step from the top of the stepladder.
- 5.3.3 Step ladders shall not be used as straight ladders.

5.4 INSPECTION AND MAINTENANCE

- 5.4.1 Ladders found to be defective shall be removed, tagged, and scrapped.

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5.5 STORAGE AND TRANSPORTATION

5.5.1 Storage areas shall permit easy access.

5.5.2 Ladders shall be stored on their sides, as practicable.

6.0 SCAFFOLDING

6.1 Erection crews must check each scaffold member during erection. Defective parts are not to be used for scaffold fabrication.

6.2 All working decks of scaffolds shall be provided with proper handrails, midrails, and toeboards. If this is not possible, then safety belts must be worn by personnel working on the scaffold.

6.3 Planks shall extend over their end supports no less than 6 inches or more than 12 inches.

6.4 Tube and frame scaffolds must be tied to the structure at intervals of 30 feet horizontally and 25 feet vertically.

6.5 The height of mobile scaffolds shall not exceed four times the base dimension, and the casters shall have positive locking devices. No person shall be allowed on a mobile scaffold while it is being moved.

6.6 Provisions should be made to protect passersby from falling objects.

7.0 DEFINITIONS

7.1 Ladder – An appliance, usually consisting of two side rails joined at regular intervals by crosspieces called steps, rungs, or cleats, on which a person may step in ascending or descending.

7.2 Step Ladder – A self-supporting portable ladder, non-adjustable in length, having flat steps and a hinged back.

7.3 Single Ladder – A non-self-supporting portable ladder non-adjustable in length, consisting of but one section. Its size is designated by the overall length of the side rail.

7.4 Extension Ladder – A non-self-supporting portable ladder adjustable in length. It consists of two or more sections traveling in guides or brackets arranged to permit length adjustment.

7.5 Fixed Ladder – A ladder permanently attached to a structure, building, or equipment.

1.0 PURPOSE

The purpose of this procedure is to establish procedures ensuring that machines or equipment are isolated and inoperative before employees perform any servicing or maintenance.

2.0 SCOPE

This procedure applies to EFR employees and contractors who are authorized to perform maintenance service activities on equipment or processes which present energy hazards and to any employees and contractors who are affected by these activities.

3.0 RESPONSIBILITY

3.1 Managers shall be responsible for ensuring employees and contractors (personnel) comply with this procedure.

3.2 Supervisors shall:

3.2.1 Ensure that personnel who are authorized to service equipment have received general lockout/tagout training, as well as specific training on any individual piece of equipment or machine that is to be locked or tagged.

3.2.2 Assign locks, if applicable or tags to authorized personnel.

3.2.3 Coordinate activities of contractors that may affect lockout/tagout and energy control procedures within the facility or on equipment.

3.2.4 Ensure that only authorized personnel's service equipment or machinery requiring lockout/tagout.

3.2.5 Forward copies of the training forms to the Safety Department.

3.3 Personnel shall be responsible for:

3.3.1 Complying with this procedure.

3.3.2 Following safe shutdown and start-up procedures.

3.3.3 Communicating activities to affected personnel and other authorized personnel, as appropriate.

3.3.4 Ensuring the security of their own lock and key.

3.3.5 Advising their supervisor when equipment needs servicing and following the directions of the authorized personnel affecting the use of that equipment.

3.4 The Safety Department shall develop and maintain the Lockout/Tagout (Energy Control) Procedure.

4.0 OBJECTIVE

General company procedure is that lockout is the preferred method of isolating machines or equipment from energy sources and shall be used whenever possible. If tags are used, additional steps shall be taken as necessary to provide the equivalent safety available from the use of a lockout device. This procedure identifies the hazards of uncontrolled energy and establish procedures for safe lockout/tagout operations.

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5.0 PROCEDURE

5.1 *METHODS OF LOCK AND TAG IDENTIFICATION*

- 5.1.1 Lockout/tagout devices shall be standardized within each facility in at least color, shape or size, and shall be durable for withstanding the environment to which they are exposed for the maximum period of time exposure is expected.
- 5.1.2 Identifiable lockout/tagout devices shall indicate the identity of the:
 - 5.1.2.1 Locks, which are numbered sequentially (1, 2, 3, etc.), will be used, if available. If locks are used, one key shall be issued to the personnel and the second key may be maintained by his/her supervisor.
 - 5.1.2.2 Tags - For tagout devices, a standardized print and format shall be used. The print shall be legible and understandable to employees. The name shall be placed on the tag permanently. Tags shall be secured by a nylon self-locking tie, which requires cutting the nylon self-locking tie in order to remove.

5.2 *PERIODIC INSPECTIONS*

- 5.2.1 Periodic inspections shall be conducted at least annually and shall be performed by authorized personnel other than those utilizing the energy control procedure under inspection. The purpose of each inspection shall be to:
 - 5.2.1.1 Identify and correct any deviations or inadequacies observed.
 - 5.2.1.2 Review authorized personnel responsibilities under the Lockout/Tagout (Energy Control) Procedure.
 - 5.2.1.3 Review the limitations of tags if tagouts are used.

5.3 *ACQUIRING LOCKS AND TAGS*

- 5.3.1 Supervisors shall provide the necessary equipment to perform lockout and tagout procedures.

5.4 *LOCKOUT/TAGOUT PROCEDURES - SHUTDOWN*

- 5.4.1 All electrically powered equipment or power circuits shall be deenergized before work is done. All circuits shall be locked out or other measures taken which shall prevent the equipment from being energized without the knowledge of the individual(s) working on it.
- 5.4.2 Authorized personnel shall make a survey to locate and identify isolating devices to be certain which switch(es), or other energy-isolating devices apply to the equipment to be locked out or tagged out.

NOTE: If more than one hazardous energy source (including stored) and/or means of disconnect (electrical, mechanical, or others) may be involved, Section 5.4.1 shall be followed; otherwise, Section 5.4.2 shall apply.

- 5.4.3 Affected personnel shall be notified that a lockout/or tagout system will be utilized and the reason.
- 5.4.4 If the machine or equipment is operating, it shall be shut down by the normal stopping procedure. This shall usually be done by depressing the stop button, opening the toggle switch, etc. In addition, the personnel shutting down the machine shall ensure that stored energy is dissipated or properly restrained.
- 5.4.5 The switch, valve, or other energy isolating device(s) shall be operated to assure that the equipment is isolated from its energy source(s).
- 5.4.6 Lockout/Tagout device application
 - 5.4.6.1 Locks or tags shall be affixed to each energy-isolating device only by authorized personnel.
 - 5.4.6.2 Locks and tags shall be singularly identified.
 - 5.4.6.3 Locks shall be affixed in a manner that will hold the energy isolating devices in a safe or off position.
 - 5.4.6.4 Tags that cannot be affixed directly to the energy-isolating device shall be located as safely as possible to the device in a position that will be immediately obvious to anyone attempting to operate the device.
- 5.4.7 For general notification, the name and description of the equipment that has been locked or tagged out shall be recorded on a bulletin board.

5.5 LOCKOUT/TAGOUT PROCEDURES - START-UP

- 5.5.1 After the servicing and/or maintenance is complete and equipment is ready for normal production operations, the area around the machines or equipment shall be checked to ensure that no one is exposed to an uncontrolled energy source.
- 5.5.2 After tools have been removed from the machine or equipment, guards have been reinstalled, and personnel are in the clear, lockout or tagout devices shall be removed and the affected employees shall be notified of the removal.
- 5.5.3 Lockout/Tagout devices shall be removed from all energy isolating devices by personnel, who applied it, except: Lockout/Tagout devices may be removed by the supervisor when the authorized personnel who applied it is unavailable and it is verified that the authorized personnel who applied the device is not at the facility.
- 5.5.4 The energy-isolating devices shall be operated to restore energy to the machine or equipment.

5.6 TESTING OR POSITIONING MACHINES, EQUIPMENT, OR COMPONENTS

- 5.6.1 In situations where lockout or tagout devices are temporarily removed from the energy isolating device and the machine equipment energized to

test or position the machine, equipment or component, this sequence of actions shall be followed:

- 5.6.1.1 The machine or equipment shall be cleared of tools and materials.
- 5.6.1.2 Personnel shall be removed from the machine or equipment area.
- 5.6.1.3 Lockout or tagout devices shall be removed.
- 5.6.1.4 Energizing shall be completed and testing or positioning shall be conducted.
- 5.6.1.5 Systems shall be deenergized and energy control measures shall be reapplied in accordance with the shutdown procedures described in this section.

5.7 *INFORMING OUTSIDE CONTRACTORS*

- 5.7.1 The supervisor shall inform outside contractors of the elements of this program and obtain information regarding their lockout/tagout program. This information shall then be conveyed by the supervisor to affected EFR personnel.

6.0 DEFINITIONS

- 6.1** Affected Personnel – An employee or contractor whose job requires him or her to operate or use a machine or piece of equipment on which service or maintenance is being performed under lockout/tagout, or whose job requires him or her to work in an area in which such service or maintenance is being performed. Affected employees must be informed when lockout/tagout is being performed.
- 6.2** Authorized Personnel – An employee or contractor who performs service or maintenance on machines and equipment. Lockout or tagout is used by these personnel for their self-protection.
- 6.3** Energized – Machines and equipment are energized when they are connected to an energy source or they contain residual or stored energy.
- 6.4** Energy – The movement or possibility of movement in equipment or machinery. Whether the power switch is on or off, energy always is present in any powered equipment.
- 6.5** Energy-Isolating Device – Any mechanical device that physically prevents the transmission or release of energy. These include, but are not limited to, manually operated electrical circuit breakers, disconnect switches, line valves and blocks.
NOTE: Push buttons, selector switches, and other control circuit type devices are not energy isolating devices.
- 6.6** Energy Source – Any source of electrical, mechanical, hydraulic, pneumatic, chemical, thermal or other energy.
- 6.7** Energy Control Procedure – A written document that contains those items of information an authorized employee needs to know in order to safely control hazardous energy during servicing or maintenance of machines or equipment.

- 6.8** Lockout – The placement of a lockout 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 lockout device is removed.
- 6.9** Lockout Device – Any device that uses positive means, such as a lock with either a key or combination, to hold an energy isolating device in a safe position, thereby preventing the energizing of machinery or equipment. When properly installed, a blank flange or bolted slip blind are considered equivalent to lockout devices.
- 6.10** Normal Production Operations – The utilization of machine or piece of equipment to perform its intended production function.
- 6.11** 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 machines or equipment, and making adjustments or tool changes, where the employee may be exposed to the unexpected energization or start-up of the equipment or release of hazardous energy.
- 6.12** Setting Up – Any work performed to prepare a machine or piece of equipment to perform its normal production operation.
- 6.13** Tagout – The placement of a tagout device on any 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 tagout device is removed.
- 6.14** Tagout Device – Any prominent warning device, such as a tag and a means of attachment that can be securely fastened to an energy isolating device in accordance with an established procedure. The tag indicates that the machine or equipment to which it is attached is not to be operated until the tagout device is removed in accordance with the energy control procedure.

1.0 PURPOSE

The purpose of this procedure is to provide specific instructions for the use of hand and power tools, and to ensure that affected employees are trained and made aware of the safety provisions which are required by federal and state agencies.

2.0 SCOPE

This procedure is designed for EFR employees and contractors (personnel) whose job assignments require the use of hand and power tools.

3.0 RESPONSIBILITY

3.1 Managers shall be responsible for ensuring compliance with this procedure.

3.2 Supervisors shall ensure that personnel comply with this procedure.

3.3 Personnel shall:

3.3.1 Follow the Hand and Power Tools Procedure.

3.3.2 Wear the Personal Protection Equipment (PPE) assigned to them.

3.3.3 Ensure that their hand and power tools are in safe operating condition and used properly for the job they were designed for.

3.4 The Safety Department shall develop and maintain the Hand and Power Tools Procedure.

4.0 OBJECTIVE

The objective of this procedure is to identify guidelines and procedures for safe operations of hand and power tools used by EFR employees.

5.0 PROCEDURE

5.1 GENERAL REQUIREMENTS

5.1.1 All hand and power tools shall be maintained in a safe condition and used only for the purpose for which they were designed. Wood handled tools shall be inspected monthly and before each use for cracks and other obvious defects. Tape shall not be used to repair cracks, the tool shall be taken out of service and the handle replaced.

5.1.2 Power operated tools designed to accommodate guards shall only be used when such guards are in place.

5.1.3 Personnel shall be provided with and use the particular personal protective equipment necessary to protect them from hazards.

5.1.4 Switches

5.1.4.1 Hand-held powered platen sanders, grinders with 2 inch or less diameter wheels, routers, planers, laminate trimmers, nibblers, shears, scroll saws and jigsaws with blade shanks 0.25 inch wide or less may be equipped with only a positive on/off control.

5.1.4.2 Hand-held powered drills, tappers, fastener drivers, horizontal, vertical and angle grinders with wheels exceeding 2 inches in diameter, disk sanders, belt sanders, reciprocating saws and

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similar tools shall be equipped with a momentary contact on/off control. They may have a lock-on control provided the power can be shut off by a single motion of the same finger(s) that turns it on.

5.1.4.3 All other hand-held power tools, such as chain saws, circular saws, and precision tools, shall be equipped with a constant pressure switch that will shut off the power when pressure is released.

5.1.5 Electric power operated tools shall either be of approved double-insulated type or effectively grounded

5.2 PNEUMATIC TOOLS

5.2.1 Pneumatic power tools and hose sections shall be secured by threaded couplings, quick disconnect couplings or by 100 pound tensile strength safety chain or equivalent across each connection to prevent the tool or hose connections from being accidentally disconnected.

5.2.2 Safety clips or retainers shall be securely installed and maintained to prevent tools from being accidentally discharged.

5.2.3 Pneumatically driven nailers, staplers and other similar equipment provided with automatic fastener feed, shall have a safety device on the nozzle to prevent the ejection of the fasteners, unless the muzzle is in contact with the work surface.

5.2.4 Compressed air shall not be used at the nozzle for cleaning purposes except when reduced to less than 30 pounds per square inch (psi) and the operator is protected by personal protective equipment. The 30 psi requirement does not apply to sandblasting, green cutting, removal of mill scale, cleaning concrete forms and similar cleaning operations.

5.2.5 The manufacturer's safe operating pressure for hoses, pipes, valves, and fittings shall not be exceeded. Defective hoses, valves and fittings shall be removed from service.

5.2.6 Air hoses shall not be used for hoisting or lowering tools. Hoses shall not be laid on ladders, steps, scaffolds, or walkways in a manner creating a tripping hazard.

5.2.7 Airless spray guns of the type which atomize paints and fluids at pressures of 1,000 psi or more shall be equipped with automatic or visible manual safety devices which will prevent pulling of the trigger and prevent release of the paint or fluid until the safety device is manually released. In lieu of the above, a diffuser nut to prevent high pressure release when the nozzle tip is removed and a nozzle tip guard to prevent the tip from contacting the operator or other equivalent protection shall be provided.

5.3 GRINDING TOOLS

5.3.1 The installation, guarding, use, and care of grinding tools shall comply with the standards set forth in the current ANSI B7.1-1978, Safety Code for the Use, Care and Protection of Abrasive Wheels. Grinding tools shall

not be used without the safety guards, protective flanges, and tool rest installed and maintained in proper adjustment.

- 5.3.2 Safety guards used on machines known as right angle head vertical portable grinders shall have a maximum exposure angle of 180 degrees and the guard shall be located between the operator and wheel when in use.
- 5.3.3 The maximum angular exposure of the grinding wheel periphery and sides for safety guards used on other portable grinding machines shall not exceed 180 degrees and the top half of the wheel shall be enclosed at all times.
- 5.3.4 Abrasive wheels and scratch brush wheels shall not be operated in excess of their rated safe speed. Cracked or defective abrasive wheels shall be removed from service immediately.

5.4 POWER SAWS

- 5.4.1 Bench-type circular saws shall be equipped with spreaders, anti-kickback devices, and guards that automatically enclose the exposed cutting edges. Portable hand-held circular saws shall be equipped with guards above and below the base plate or shoe. The upper guard shall cover the saw to the depth of the teeth, except for the minimum arc required to permit the base to be tilted for level cuts. The lower guard shall cover the saw to the depth of the teeth, except for the minimum arc required to allow proper retraction and contact with the work. As the blade is withdrawn, the lower guard shall automatically and instantly return to the covering position.
- 5.4.2 The operating speed shall be permanently marked on all circular saws over 20 inches in diameter or operating speeds over 10,000 peripheral feet per minute. Only blades designed for use at the marked operating speed shall be used. When the saw is re-tensioned for a different speed, the marking shall be changed to indicate the new speed.
- 5.4.3 Radial arm saws and swing cutoff saws shall be equipped with:
 - 5.4.3.1 Limit stops which prevent the leading edge of the blade from traveling beyond the edge of the table.
 - 5.4.3.2 Hoods and/or guards that protect the operator from flying material direct the sawdust toward the back of the blade and enclose all parts of the blade not in contact with the material being cut.
 - 5.4.3.3 Automatic brakes or automatic return devices.

5.5 HYDRAULIC-POWERED TOOLS

- 5.5.1 The manufacturer's safe operating pressure hoses, valves, pipes, filters and fittings shall not be exceeded.
- 5.5.2 Fluid in hydraulic powered tools shall be fire resistant type approved by a recognized authority, such as Underwriters Laboratories.

5.6 POWDER-ACTUATED TOOLS

- 5.6.1 Powder-actuated tools shall be designed, maintained and used in accordance with the standards set forth in the current edition of ANSI AIO.3, "Safety Requirements for Powder-Actuated Fastening Systems."
- 5.6.2 Powder-actuated tools shall be operated and serviced only by persons who have been trained and certified in the safe use of such tools. Operators must possess an operator's card issued by a firm or an authorized person.
- 5.6.3 Powder-actuated tools shall not be used in explosive or flammable atmospheres.
- 5.6.4 Only powder charges, studs or fasteners specified by the manufacturer for the specified tools shall be used.
- 5.6.5 Tools shall be designed to operate only when pressed against the work surface with a force at least 5 pounds greater than the weight of the tool. They shall be constructed so the tool cannot fire when dropped or during loading or preparation to fire.
- 5.6.6 Tools shall not be loaded until just prior to firing. Loaded tools shall not be left unattended. Tools shall not be pointed at any person, and all parts of the body shall be kept clear of the muzzle.
- 5.6.7 Tools shall be tested each day before loading to ensure that the safety devices are in proper working order. The test shall be conducted in accordance with the manufacturer's recommended test procedure.
- 5.6.8 Each tool shall bear a legible permanent model designation, which shall serve as a means of identification. Each tool shall also bear a legible, permanent manufacturer's unique serial number.
- 5.6.9 A lockable container shall be provided for each tool. The words "Powder Actuated Tool" shall appear in plain sight on the outside of the container. The following notice shall be attached on the inside cover of the container: "WARNING- POWDER ACTUATED TOOL. TO BE USED ONLY BY A QUALIFIED OPERATOR AND KEPT UNDER LOCK AND KEY WHEN NOT IN USE."
- 5.6.10 Each tool shall be supplied with the following:
 - 5.6.10.1 Operator's instruction and service
 - 5.6.10.2 Power load chart
 - 5.6.10.3 Tool inspection record
 - 5.6.10.4 Service tools and accessories

5.7 HAND-POWERED WINCHES AND HOISTS

- 5.7.1 Hand powered winches and hoists shall be used within the manufacturer's rated capacity, and the capacity shall be legibly marked on the winch or hoist.

5.7.2 The use of hand cranks is prohibited unless the winch or hoist is equipped with positive self locking dogs or of the worm gear type. Hand wheels shall not have projecting spokes or knobs.

6.0 DEFINITIONS

- 6.1** Powder Actuated Tool – A tool that utilizes the expanding gases from a power load to drive a fastener.
- 6.2** Power Load – The energy source used in powder actuated tools.
- 6.3** Qualified Operator – A person/employee who has received documented training on the manufacturer’s recommended safe operating procedures of the tool and demonstrated competency in its use.

1.0 PURPOSE

This procedure describes the training of respirator users, how to use a respirator, selecting a respirator, and fit testing of respirators. The purpose of this procedure is to minimize the inhalation of radioactive materials and chemicals by humans to levels that are As Low As Reasonably Achievable (ALARA).

2.0 APPLICABILITY

This procedure applies to all personnel that use respirators and to the personnel that train and fit test respirator users.

3.0 OTHER DOCUMENTS

3.1 REFERENCES

3.1.1 Regulatory Basis

3.1.1.1 Normal license requirements are that:

“Personal protective equipment shall be used at all times in any area or for any activity designated by the RSO. The licensee shall maintain a record of respirator maintenance, fitting and training.”

3.1.2 Other References

3.1.2.1 Procedure No. HS-131 - Respirator Inspection, Maintenance, Cleaning, and Storage.

3.1.2.2 Procedure No. HS-132 - Medical Evaluation for Respirator Use.

3.1.2.3 U.S. Nuclear Regulatory Commission Regulatory Guide 8.15, Acceptable Programs for Respiratory Protection.

3.1.2.4 American National Standard Practices for Respiratory Protection ANSI Z88.2-1969.

3.1.2.5 American National Standard Practices for Respiratory Protection – Respirator Uses – Physical Qualifications for Personnel, ANSI Z88.6-1984.

3.1.2.6 CDPHE 6 CCR 1007-1, Part 4, Section 4.24 and USNRC 10 CFR 20, Subpart H Respiratory Protection and Controls to Restrict Internal Exposure in Restricted Areas.

3.2 EXHIBITS

3.2.1 Exhibit 1 – 6 CCR 1007-1 Appendix 4A to Part 4, CDPHE Respirator Protection Factors

3.2.2 Exhibit 2 – Respirator Protection Program Requirements

3.3 APPENDICES

3.3.1 Appendix A – Form HS-130A Respiratory Protection Training

3.3.2 Appendix B – Form HS-130B Respirator Qualitative Fit Test Record

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4.0 EQUIPMENT AND MATERIALS

4.1 *EQUIPMENT*

- 4.1.1 Half-face respirators.
- 4.1.2 Full-face respirators.
- 4.1.3 Powered air respirators
- 4.1.4 Respirators with supplied air line
- 4.1.5 Self Contained Breathing Apparatus (SCBA)
- 4.1.6 Respirator quantitative fit testing equipment, such as Portacount Plus model 8020 or equivalent
- 4.1.7 Respirator qualitative fit testing equipment (irritant smoke or banana oil) or the equivalent for helmet respirators and as a backup for the quantitative fit test.

5.0 RESPONSIBILITY

- 5.1 The Radiation Safety Officer (RSO) or his designee is responsible for:
 - 5.1.1 The respiratory protection program and providing technical assistance when needed. The RSO or his designee is the Respirator Program Administrator.
- 5.2 The Assistant RSO or his designee is responsible for:
 - 5.2.1 Training of respirator users and administering the respirator fit tests.
- 5.3 A Physician or his designee is responsible for:
 - 5.3.1 Determining if individuals are physically able to use respirators.
- 5.4 The respirator user has the ultimate responsibility for:
 - 5.4.1 Respirator use and is authorized to leave a respirator area whenever needed. In addition each respirator user is responsible to ensure that no one else uses their respirator while it is assigned to them.

6.0 PREREQUISITE INFORMATION

6.1 *SAFETY*

- 6.1.1 Standby rescue persons are to be provided when workers wear supplied air hoods that are difficult to remove without assistance. Such standby persons are to be equipped with respirators that are appropriate for the potential hazards, must observe or otherwise be in direct communication with such workers, and must be immediately available to assist them in case of a failure of the air supply or other distress. The number and experience of the standby rescue personnel must be sufficient to render effective assistance if needed.
- 6.1.2 The RSO or his designee prior to use must approve SCBA use.

6.2 *FREQUENCY*

- 6.2.1 Medical evaluation of respirator users, at least once every 12 months \pm 3 months.

- 6.2.2 Respirator user training and fit tests at least once every 12 months \pm 3 months. Three consecutive user training and fit-test periods should not exceed 39 months.
- 6.2.3 Respirator positive or negative pressure seal test each time a face-sealing respirator is used.

7.0 PROCEDURES

7.1 *POLICY STATEMENT*

- 7.1.1 Energy Fuels Resources respiratory use policy is presented as an attachment to this procedure. The policy addresses:
 - 7.1.1.1 The use of process or other engineering controls, instead of respirators,
 - 7.1.1.2 The routine, non-routine, and emergency use of respirators, and,
 - 7.1.1.3 The length of periods of respirator use and relief from respirator use.

7.2 *ALARA EVALUATIONS*

- 7.2.1 The RSO or his designee conducts an “As Low As Reasonably Achievable” evaluation of radiation dose to respirator users prior to their use of respirators in the processing facility. The RSO or his designee is to evaluate whether the internal dose avoided by using the respirator is likely to be less than or greater than any additional external dose that may result from the respirator induced inefficiency and other factors including non-radiological factors. If the dose saved by using the respirator is greater than the extra external dose, then the respirator should be issued to a medically qualified, trained, and fit-test qualified individual. Items to be included in the evaluation include:
 - 7.2.1.1 Environmental conditions of respirator use.
 - 7.2.1.2 Worker efficiency using protective equipment.
 - 7.2.1.3 User comfort.
 - 7.2.1.4 Experience and skill of the user performing the work in the processing facility.
 - 7.2.1.5 Process and engineering controls.
 - 7.2.1.6 Radiological conditions of the work to be performed.
 - 7.2.1.7 History with this or similar jobs.
- 7.2.2 Jobs or tasks that would result in a workers external deep dose equivalent (DDE) of less than 500 mrem do not need an ALARA evaluation (NRC Regulatory Guide 8.15 section 2.3).

7.3 *ENGINEERING CONTROLS*

- 7.3.1 Check that all practical engineering and administrative controls, e.g. ventilation controls, equipment seals, and emission controls, to keep airborne radionuclide concentrations to levels that are as low as reasonably achievable (ALARA) have been implemented before entering Airborne

Radioactivity Areas. When the levels are not ALARA, the internal radiation doses to humans are to be limited using access controls, limited exposure times, respiratory protection devices or other means.

7.4 MEDICAL EVALUATION OF RESPIRATOR USERS

- 7.4.1 All respirator users or intended users must be evaluated by a physician or his designee every 12 months \pm 3 months, or at a frequency determined by the physician, to evaluate if the user is physically able to use the respiratory protection equipment. The physician's designee may include a registered nurse (RN), licensed practical nurse (LPN), or someone who, in the judgment of the physician, has adequate experience, education, training, and judgment to evaluate the individual. Reevaluations are to occur every 12 months \pm 3 months or at a frequency determined by the physician.
- 7.4.2 The physician is to complete Form HS-132A (See Procedure HS-132) or its equivalent and designate on page 1 of the form whether or not the individual, in his opinion, is physically able to wear respirators. Individuals may receive an unrestricted or restricted approval from the physician to use respirators.
- 7.4.3 The respirator user is to sign the medical consent included on Form HS-132A (See Procedure HS-132).

7.5 TRAINING OF RESPIRATOR USERS AND SUPERVISORS

- 7.5.1 Train the potential respirator users in the following topics:
- 7.5.1.1 The hazards to which the respirator user may be exposed.
 - 7.5.1.2 The effects of contaminants on the wearer if the respirator is not worn properly.
 - 7.5.1.3 The capabilities and limitations of each type of respirator to be used.
 - 7.5.1.4 The proper use of spectacle adapters, and communication equipment.
 - 7.5.1.5 Donning, using, and removing each type of respirator. Users must demonstrate competency in donning, using, and removing their respirators during the training session.
 - 7.5.1.6 When and how to inspect each type of respirator to be worn.
 - 7.5.1.7 Cleaning procedures to assure workers that they will receive a clean disinfected respirator.
 - 7.5.1.8 How to perform user seal tests, i.e., positive and negative pressure tests. The user must demonstrate competency in performing seal tests during the training session.
 - 7.5.1.9 The respirator user may leave the work area at any time for relief from respirator use in the event of equipment malfunction, physical or psychological distress, procedural or communications

failure, significant deterioration of operating conditions, or any other condition that might necessitate such relief.

7.5.1.10 In case of respirator malfunction or wearer distress, the respirator may be removed as the respirator user exits the airborne contamination area.

7.5.1.11 ALARA evaluation of radiation doses to users with and without a respirator.

7.5.2 Train the supervisors of respirator users in the following topics:

7.5.2.1 The need for engineering controls in preference to the use of respirators.

7.5.2.2 The hazards to which the respirator user may be exposed.

7.5.2.3 The effects of contaminants on the user if the respirator is not worn properly.

7.5.2.4 The capabilities and limitations of each respirator to be used.

7.5.2.5 The respirator user is authorized to leave a respirator area whenever needed.

7.5.3 The RSO or his designee will have appropriate training to administer the respirator protection program and to provide technical assistance when needed.

7.5.4 Document the training provided, to whom, and when on Form HS-130A.

7.6 INSTRUCTOR TRAINING

7.6.1 Qualifications for instructors providing respiratory protection training are:

7.6.1.1 On-the-job training in respiratory protection,

7.6.1.2 Training from an RSO, or his designee, in respiratory protection,
or

7.6.1.3 Classroom training in respiratory protection.

7.6.2 Document the training of the instructors.

7.7 QUANTITATIVE FIT TESTING

7.7.1 Only medically qualified and trained personnel are to be quantitatively fit tested. Quantitative fit testing is the primary method of fit testing respirator users.

7.7.2 Quantitative fit testing is performed only in negative pressure mode of operation. Quantitative fit testing for negative pressure respirators should demonstrate an overall protection factor of at least 10 times the Protection Factor (PF) in the Colorado equivalent of Appendix 4A to Part 4 of the Colorado Department of Public Health and Environment Radiation Control Division regulations. Otherwise the APF cannot be used in the assessment of radiation dose to the individual.

7.7.3 The Portacount Plus model 8020 or equivalent quantitative respirator fit testing instrument compares the concentration of particles outside the respirator with the concentration of particles that have leaked into the

respirator. The ratios of outside concentrations to inside concentrations are the respirator protection factors. The instrument not only determines the fit of the respirator but also determines if a respirator or cartridge is leaking. The Radiation Safety Technician is to place an adaptor between the cartridge and the respirator. Place the respirator on the person being fit tested and connect the Portacount or equivalent instrument to sample the air inside the respirator. Measure the particulate concentrations inside and outside the respirator as specified in the Portacount instruction manual. Determine if the respirator is well fitted to the user or not. Document the measurements and a pass/fail for the quantitative respirator fit test. Remove the adaptor and allow the user to use the respirator if he has passed the quantitative fit test. If the test is failed adjust the respirator size, fit, or exchange the respirator with a properly functioning respirator.

7.7.4 Document the quantitative fit test results, the wearer and the date.

7.8 QUALITATIVE FIT TESTING

7.8.1 Conduct qualitative fit testing of respirator users when:

7.8.1.1 Quantitative fit test equipment is malfunctioning

7.8.1.2 Quantitative fit test equipment is not available when needed (e.g. during an emergency)

7.8.1.3 Helmet or other positive pressure type respirators are to be used

7.8.1.4 A seal test other than the positive or negative pressure test is needed

7.8.2 Determine that the respirator user can detect (smell, taste, or react to) the challenge atmosphere. Challenge agents may consist of stannic chloride (irritant smoke), or amyl acetate (or isoamyl acetate, or isopentyl acetate) commonly called banana oil, or the equivalent.

7.8.3 Follow the normal procedure to administer the irritant smoke qualitative fit test. Be sure that the person administering the test is wearing a respirator. For either the irritant smoke test or the banana oil fit test, the standard fit test protocol will be used. The user is to perform exercises while in the challenge atmosphere. Typical exercises which require a minimum of 2 minutes to complete include:

7.8.3.1 Normal breathing

7.8.3.2 Deep breathing

7.8.3.3 Turn head side to side

7.8.3.4 Move head up and down

7.8.3.5 Talk

7.8.3.6 Grimace

7.8.3.7 Bend at the waist

7.8.4 The technician administering the qualitative test needs to instruct the user that the test is for their own protection and the results will not be used in any way to evaluate their job performance. Proceed with the test only if

the technician administering the test believes that the respirator user will answer the fit test questions truthfully.

- 7.8.5 Install a canister on the respirator that is capable of removing banana oil, or the equivalent challenge agent from the air.
- 7.8.6 Moisten a cotton swab or paper towel with banana oil and wave the swab or towel under and around the respirator user's head and shoulders while the user performs a sequence of head, neck and body movements. Ask if the user can detect the banana oil. Have the user remove the respirator and ask if the user can then detect the smell of banana oil. If the user cannot detect the smell while the respirator is being worn but can detect the smell while the respirator is not being worn, the qualitative fit test is passed.
- 7.8.7 Document the type of qualitative fit test administered, to whom, the results and the date on Form HS-130B.

7.9 **RETESTING**

- 7.9.1 Respirator fit tests are to be done every 12 months \pm 3 months. Three consecutive fit test periods should not exceed 39 months.
- 7.9.2 Retesting should be performed if the following has occurred since the last fit test:
 - 7.9.2.1 The weight of the respirator user changes by 10% or more.
 - 7.9.2.2 Significant facial injury or scarring in the area of the face piece seal.
 - 7.9.2.3 Significant dental changes that could affect the face piece seal.
 - 7.9.2.4 Reconstructive or cosmetic surgery that could affect the face piece seal.
 - 7.9.2.5 Other conditions that could affect the face piece seal.

7.10 **USER SEAL CHECKS**

- 7.10.1 Each respirator user is to perform at least one of the following seal checks each time a face-sealing respirator is used:
 - 7.10.1.1 **Positive-Pressure Test** - Close off the exhalation valve and exhale gently into the face piece. The face fit is considered satisfactory if a slight positive pressure can be built up inside the face piece without any evidence of outward leakage of air at the seal. For most respirators this method of leak testing requires the user to first remove the exhalation valve cover before closing off the exhalation valve and then carefully replacing it after the test.
 - 7.10.1.2 **Negative-Pressure Test** - Close off the inlet opening of the canister or cartridge(s) by covering with the palm of the hand(s) or a thin latex or nitrile glove or the equivalent. Inhale gently so that the face piece collapses slightly, and hold the breath for 10 seconds. If the face piece remains in its slightly collapsed condition and no inward leakage of air is detected, the tightness of the respirator is considered satisfactory.

7.11 OPERATIONAL CHECKS

7.11.1 Non-face-sealing respirators should be operationally checked prior to use by allowing air to flow through the respirator for approximately one minute. During this time support personnel are to verify that the air pressure at the distribution manifold, if present, is within the proper range specified by the manufacturer and that the user feels that the airflow is adequate.

7.12 COMMUNICATION

7.12.1 The RSO or his designee is to ensure that respirator users can communicate well enough to work safely and to keep their radiation dose ALARA. If necessary, voice amplification devices may be used.

7.13 VISION

7.13.1 The RSO or his designee is to ensure that respirator users can see well enough to be able to work safely and to keep radiation dose ALARA. Spectacle adapter kits for respirators may be used. Contact lenses are permitted for use with respirators provided the user can successfully wear the lenses with the respirators. Another option is to use a hood or helmet respirator when corrective lenses are needed.

7.13.2 Consider the use of anti-fogging devices and agents especially when the respirators are used in low-temperature environments.

7.14 HELMET RESPIRATORS

7.14.1 Helmet respirators provide a stream of filtered air across the face of the user. No respirator to face seal is required for operation. This type of respirator is desirable when a good respirator to face seal is not possible, when fogging of the respirator is a problem, or psychological problems such as claustrophobia exist.

7.14.2 Quantitative fit tests are usually not possible to perform with the helmet type respirator. Use a qualitative fit test to determine that the respirator is providing the desired respirator protection.

7.15 FACIAL HAIR

7.15.1 Persons using face piece respirators shall not have any facial hair that interferes with the sealing of the respirator.

7.15.2 The prohibition of facial hair applies to respirators that seal on the users face. Helmet type respirators may be used with facial hair providing the RSO or his designee determines that the facial hair does not interfere with the operation of the respirator.

7.16 SELECTION OF RESPIRATORY PROTECTION EQUIPMENT AND CARTRIDGES

7.16.1 The Radiation/Security Technician must determine which respirators and cartridges are to be used in the different parts of the uranium processing facility and shall refer to Exhibit 2 attached. When in doubt the RSO or his designee is to make the determination based on the radiological conditions present at the work site, the Assigned Protection Factors, and whether the

job is routine, non-routine, or an emergency. When deciding which respirator is to be considered for a particular job the RSO or his designee will divide the average ambient concentration of radioactive material in the work place air (or the estimated average) by the appropriate DAC value for the contaminants present. The number obtained may be considered initially as an ideal minimum APF for the selected device. If the ALARA evaluation determines that use of a respiratory protection device might be justified, the RSO or his designee should consider a device with this APF or greater. If the selection of a respirator with this APF is inconsistent with ALARA, however, the RSO or his designee may select a device with a lower APF. Worker safety factors other than radiological factors, such as heat stress, impaired vision, or resuspension of radioactive materials are to be taken into account when performing such an ALARA evaluation.

- 7.16.2 Use only respiratory protection equipment that has been tested and certified or has certification extended by the National Institute for Occupational Safety and Health/Mine Safety and Health Administration (NIOSH/MSHA).
- 7.16.3 Supply adequate equipment or materials to reduce the likelihood that respirator use might contribute to workplace accidents or injury (e.g. spectacle adapters, voice amplifiers, defogging agents).
- 7.16.4 Supply safety equipment that do not interfere with the proper fit of operation or the respirator (e.g., welder's shields, communication devices).
- 7.16.5 Appendix A to Part 4 of the Colorado Department of Public Health and Environment Radiation Control Division regulations is attached as Exhibit 1 and provides the protection factors that can be used for respirators.
- 7.16.6 An open circuit self contained breathing apparatus (SCBA) operated in the pressure-demand mode with a minimum rated service of 30 minutes is to be used for emergency entry into an unassessed environment or into an area with high concentrations of a chemical hazard. Also acceptable are a combination full-face pressure demand supplied air respirator with an auxiliary self-contained air supply of at least 5 minute duration and a positive-pressure, closed-circuit (recirculating) SCBA with a minimum rated service life of 30 minutes.

7.17 AIR SAMPLING

- 7.17.1 The Radiation/Security Technicians are to sample the airborne radionuclides in the uranium processing facility and to assess the radiological conditions present, or to use historical data to assess the radiological conditions, prior to the selection and issuance of respirators.

7.18 RESPIRATOR PROTECTION PROGRAM AUDITS

- 7.18.1 Audits of the respiratory protection program are conducted as part of the annual review of the radiation protection program.

7.19 ENTRY INTO AN IDLH ENVIRONMENT

7.19.1 Entries into Immediately Dangerous to Life and Health (IDLH) environments will be made only by individuals equipped with SCBAs operated in the pressure demand mode (or positive-pressure mode for closed-circuit SCBAs).

Persons making such entries will use the “buddy system.” The buddies should always have one another in sight. The in-sight criterion might not be possible in a fire-fighting situation, so in this case, some other accountability system should be used.

7.19.2 There will be a standby rescue person equipped with SCBAs outside the IDLH area but immediately ready to enter the area to rescue a person who is in trouble. The number of standby rescue person should be sufficient to accomplish a rescue in a timely fashion if the occasion arises.

Confined Space Entry Procedure HS-050

Appendix A

Confined Space Entry Permit Form HS-050A

Appendix 4A to Part 4 of the Colorado Department of Public Health and Environment Hazardous Material and Waste Management Division Regulations
Protection Factors for Respirators^a (Format has been revised)

	Operating mode	Assigned Protection Factors^a
I. Air Purifying Respirators [Particulate^b only] ^c:		
Filtering facepiece disposable ^d	Negative Pressure	(^d)
Facepiece, half ^e	Negative Pressure	10
Facepiece, full	Negative Pressure	100
Facepiece, half	Powered air-purifying respirators	50
Facepiece, full	Powered air-purifying respirators	1000
Helmet/hood	Powered air-purifying respirators	1000
Facepiece, loose-fitting	Powered air-purifying respirators	25
II. Atmosphere supplying respirators [particulate, gases and vapors^f]:		
1. Air-line respirator:		
Facepiece, half	Demand	10
Facepiece, half	Continuous Flow	50
Facepiece, half	Pressure Demand	50
Facepiece, full	Demand	100
Facepiece, full	Continuous Flow	1000
Facepiece, full	Pressure Demand	1000
Helmet/hood	Continuous Flow	1000
Facepiece, loose-fitting	Continuous Flow	25
Suit	Continuous Flow	(^g)
2. Self-contained breathing Apparatus (SCBA):		
Facepiece, full	Demand	^h 100
Facepiece, full	Pressure Demand	ⁱ 10,000
Facepiece, full	Demand, Recirculating	^h 100
Facepiece, full	Positive Pressure Recirculating	ⁱ 10,000
III. Combination Respirators:		
Any combination of air-purifying and atmosphere-supplying respirators	Assigned protection factor for type and mode of operation as listed above.	

^a These assigned protection factors apply only in a respiratory protection program that meets the requirements of this part. They are applicable only to airborne radiological hazards and may not be appropriate to circumstances when chemical or other respiratory hazards exist instead of, or in addition to, radioactive hazards. Selection and use of respirators for such circumstances must also comply with department of labor regulations. Radioactive contaminants for which the concentration values in Table 4B1, Column 3 of Appendix 4B are based on internal dose due to inhalation may, in addition, present

external exposure hazards at higher concentrations. Under these circumstances, limitations on occupancy may have to be governed by external dose limits.

- ^b Air-purifying respirators with APF <100 must be equipped with particulate filters that are at least 95 percent efficient. Air-purifying respirators with APF = 100 must be equipped with particulate filters that are at least 99 percent efficient. Air-purifying respirators with APFs >100 must be equipped with particulate filters that are at least 99.97 percent efficient.
- ^c The licensee may apply to the commission for the use of an APF greater than 1 for sorbent cartridges as protection against airborne radioactive gases and vapors (e.g., radioiodine).
- ^d Licensees may permit individuals to use this type of respirator who have not been medically screened or fit tested on the device provided that no credit be taken for their use in estimating intake or dose. It is also recognized that it is difficult to perform an effective positive or negative pressure pre-use user seal check on this type of device. All other respiratory protection program requirements listed in 4.24.1 apply. An assigned protection factor has not been assigned for these devices. However, an APF equal to 10 may be used if the licensee can demonstrate a fit factor of at least 100 by use of a validated or evaluated, qualitative or quantitative fit test.
- ^e Under-chin type only. No distinction is made in this appendix between elastomeric half-masks with replaceable cartridges and those designed with the filter medium as an integral part of the facepiece (e.g., disposable or reusable disposable). Both types are acceptable so long as the seal area of the latter contains some substantial type of seal-enhancing material such as rubber or plastic, the two or more suspension straps are adjustable, the filter medium is at least 95 percent efficient and all other requirements of this part are met.
- ^f The assigned protection factors for gases and vapors are not applicable to radioactive contaminants that present an absorption or submersion hazard. For tritium oxide vapor, approximately one-third of the intake occurs by absorption through the skin so that an overall protection factor of 3 is appropriate when atmosphere-supplying respirators are used to protect against tritium oxide. Exposure to radioactive noble gases is not considered a significant respiratory hazard, and protective actions for these contaminants should be based on external (submersion) dose considerations.
- ^g No National Institute of Occupational Safety and Health (NIOSH) approval schedule is currently available for atmosphere supplying suits. This equipment may be used in an acceptable respiratory protection program as long as all the other minimum program requirements, with the exception of fit testing, are met (that is, 4.24.1).
- ^h The licensee should implement institutional controls to assure that these devices are not used in areas immediately dangerous to life or health (IDLH).
- ⁱ This type of respirator may be used as an emergency device in unknown concentrations for protection against inhalation hazards. External radiation hazards and other limitations to permitted exposure such as skin absorption shall be taken into account in these circumstances. This device may not be used by any individual who experiences perceptible outward leakage of breathing gas while wearing the device.

Respiratory Protection-Use and Fit Test Procedure HS-130

Exhibit 1

**Appendix 4A to Part 4 of the Colorado Department of Public
Health and Environment Hazardous Materials and Waste
Management Division Regulations**

Respiratory Protection-Use and Fit Test Procedure HS-130

Exhibit 2

Respiratory Protection Program: Requirements

Respiratory Protection Program Requirements

1. It is the policy of Energy Fuels Resources to prevent the contamination of the breathing atmosphere by harmful dusts, fogs, fumes, mists, gases, smokes, sprays or vapors as far as feasible by accepted engineering control measures (enclosure or confinement of operation, local control ventilation, baghouses, scrubber systems and water sprays). When such controls are not feasible, Energy Fuels Resources will require the use of respiratory protection in areas where necessary to protect the health of the employee.
2. The selection of the proper respiratory protection equipment and cartridge shall be the responsibility of the Radiation Safety Department and only NIOSH/MSHA approved respiratory protection equipment will be used.
 - a. As a general guideline, and unless these requirements are amended, the following respiratory protection equipment and cartridges are approved for use in the areas designated.
 - I. Any areas where airborne uranium ore dust is present - MSA Comfo II Respirator with Type H high efficiency cartridges, Survivair respirator with HEPA filter, or RACAL Airstream helmet with P3 HEPA filter or comparable respiratory protection equipment as supplied by the Company.
 - II. Yellowcake drying and barreling enclosure – Helmet-typed respirator with P3 HEPA filter or comparable respiratory protection equipment as supplied by the Company.
 - III. Vanadium product area (entire section during Vanadium operations) - MSA Ultra-Vue full facepiece respirator with type GMD-II combination cartridges or comparable respiratory protection equipment as supplied by the Company. Respiratory protection equipment must be used at all times while working in this area. All non-routine maintenance (baghouse, rotary kiln or fusion furnace) will require the use of constant flow airline respirators at all times.
 - IV. Other mill areas where respiratory protection may be required are:
 - i. Grind and leach area for protection from acid mists, fumes, sulfur dioxide or radon progeny. MSA Comfo II, MSA Ultra-Vue full facepiece or Survivair respirator with chemical cartridges capable of filtering acid gases, etc. or comparable respiratory protection as provided by the Company.
 - ii. Solvent Extraction Circuits - MSA Comfo II, MSA Ultra-Vue, or Survivair with chemical cartridges designed for ammonia and amines or comparable respiratory protection equipment as supplied by the Company.
 - iii. Truck unloading area - MSA Ultra-Vue full face piece respirators with Type GMD chemical cartridges for ammonia and amines when unloading ammonia and type GMB chemical cartridges when unloading sulfuric acid or hydrogen peroxide or comparable respiratory protection equipment as provided by the Company.
 - b. When welding in any areas, the respiratory protective is available:

- I. The Racal Airstream Welding helmet with various types of filter media available.
 - II. MSA constant flow airline respirator with matching filters for dust, mists, fumes and radionuclides and attached welding helmet.
 - III. Other comparable respiratory protection systems as supplied by the Company.
3. Instruction and training in the proper use of respirators is conducted in accordance with Energy Fuels Resources MSHA approved training program and will be provided during new employee-training and periodically when respirator fit testing is conducted. Training will also be provided on a refresher basis for those employees that do not routinely wear respirators.
 4. Only the MSA Comfo-II, Survivair, and comparable respirators are assigned to each employee for exclusive use. The remaining respiratory protection equipment is issued on an as needed basis by the Radiation Safety Department.
 5. Individuals assigned respirators for exclusive use shall comply with the following:
 - a. Respirators shall be inspected by the wearer before and after each use to insure that the respirator is in good condition. This inspection shall include the following checks:
 - i. Deformed or bent facepiece.
 - ii. Deformed or stretched headbands or straps.
 - iii. Deformed or misshaped facepiece to face sealing surface.
 - iv. Cracks, tears, or holes in the facepiece.
 - v. Cartridge gaskets for defects or absence.
 - vi. Inhalation valves for defects or absence.
 - vii. Inhalation valve seats for damage or defects.
 - viii. Exhalation valve for defects or absence.
 - ix. Exhalation valve seats for damage or defects.
 - x. Exhalation valve cover for absence.
 - xi. Obvious physical damage to cartridges.
 - xii. Incorrect or out-dated cartridges.
 - xiii. Cleanliness.
 - b. Employees shall use the respirator as instructed.
 - c. Employees shall guard against damaging the respirator.
 - d. Employees shall go immediately to an area containing respirable air if the respirator fails to provide proper protection.
 - e. Employees shall report any respirator malfunction to their supervisor.
 - f. Respirators needing to be cleaned will be returned to the Radiation/Security technician and exchanged for a clean respirator.
 - g. Respirators should be stored in the plastic bags issued with them and in a clean and sanitary location to prevent contamination when not in use.

- h. Respirators shall not be worn when conditions prevent a good face-piece to face seal (e.g. individuals with facial hair that intrudes into the respirator sealing surface).
- i. Qualitative fit tests shall be performed in the following manner before each use:
 - i. Negative Pressure Test - The wearer can perform this test by covering the inhalation ports with the palms or squeezing the breathing tube so that it does not pass air; inhaling gently so that the facepiece collapses slightly and holding the breath for 10 seconds. If the facepiece remains slightly collapsed and no inward leakage is detected, the respirator is tight enough.
 - ii. Positive Pressure Test - This test is conducted by closing off the exhalation valve and exhaling gently into the facepiece. The fit is considered satisfactory if slight positive pressure can be built up inside the facepiece without any evidence of outward leakage.
 - iii. If either test gives an unsatisfactory result, the headbands and straps for the respirator facepiece must be adjusted until leakage is not detected.
- 6. All respirators used by more than one worker (constant flow airline) shall be thoroughly cleaned and sanitized after each use. No employee shall use any respirator that has been worn by another employee until it has been cleaned and sanitized. These respirators shall be stored in a clean and sanitary location.
- 7. It shall be the responsibility of all Energy Fuels Resources Management Personnel with the assistance of the Radiation Safety Department to maintain employee exposure at levels As Low As Reasonably Achievable (ALARA) and to evaluate the respirator program regularly to determine its continued effectiveness.
- 8. No employee shall use any airline outlet installed for the exclusive use of constant flow airline respirators for air tools, etc. To do so may contaminate the lines and adversely affect the health and safety of fellow employees.
- 9. The determination as to the physical ability of an individual to wear respiratory protection shall be made as required by the applicable State and Federal regulations.

Respiratory Protection-Use and Fit Test Procedure HS-130

Appendix A

Respirator Protection Training Form HS-130A

RESPIRATORY PROTECTION TRAINING

DATE: _____
 TIME: _____ TO _____

TO: _____
 PLANT MANAGER

FROM: _____

EFR EMPLOYEES
 CONTRACTOR EMPLOYEES
 COMPANY NAME(S) _____

(Signature) _____

Employee Name	Employee Signature	Employee Number	Date	Company

THE FOLLOWING SUBJECTS WERE DISCUSSED:

TOTAL HOURS: _____

RAD. SAFETY HOURS: _____

Respiratory Protection-Use and Fit Test Procedure HS-130

Appendix B

Respirator Qualitative Fit Test Record Form HS-130B

RESPIRATOR QUALITATIVE FIT TEST

Date

Employee Name

Signature

A. Respirator Selected:

1. Manufacturer _____
2. Model _____
3. Size _____
4. Approval Number _____

B. Testing Agent:

1. Isoamyl Acetate (Isopentyl Acetate) _____
2. Sodium Saccharin Solution _____
3. Irritant Fume (Stannic Chloride) _____
4. Other _____

C. Date of Last Medical Exam _____

D. Due Date for Next Fit Test (annually) _____

E. I have reviewed the Medical Examination Form for the person being fit tested and it is current. (Physical exams are required annually)

F. I attest that this *Qualitative Respirator Fit Test* was performed in compliance with proper procedures.

G. Fit Test Conductor Information:

1. Signature _____
2. Printed/Typed Name _____
3. Title _____
4. Telephone _____
5. Address _____

Energy Fuels Resources Piñon Ridge Mill Montrose County, Colorado	RESPIRATOR MAINTENANCE, INSPECTION, CLEANING AND STORING PROCEDURE	Number: HS-131 Page: 1 of 5 Revision: 0 Date: 10/07/09
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1.0 PURPOSE

This procedure describes the cleaning, maintenance, repair, inventory, control, storage, and issuance of respirators. The purpose of this procedure is to minimize the inhalation of radioactive materials and chemicals by humans to levels that are As Low As Reasonably Achievable (ALARA).

2.0 APPLICABILITY

This procedure applies to all personnel that clean, maintain, inventory, control, store, and issue respirators.

3.0 OTHER DOCUMENTS

3.1 REFERENCES

3.1.1 Regulatory Basis

3.1.1.1 Radioactive Materials Licenses normally state: “Personal protective equipment shall be used at all times in any area or for any activity designated by the RSO. The licensee shall maintain a record of respirator maintenance, fitting and training.”

3.1.2 Other References

3.1.2.1 Procedure HS-130, Respirator Use and Fit Test.

3.1.2.2 U.S. Nuclear Regulatory Commission Regulatory Guide 8.15, Acceptable Programs for Respiratory Protection.

3.1.2.3 American National Standard Practices for Respiratory Protection ANSI Z88.2-1969.

3.1.2.4 American National Standard Practices for Respiratory Protection – Respirator Uses – Physical Qualifications for Personnel, ANSI Z88.6-1984

3.2 APPENDICES

Appendix A – Respirator Inspection, Maintenance, Cleaning, and Storage Form HS-131A

Appendix B – Respirator Issuance Form HS-131B

4.0 EQUIPMENT AND MATERIALS

4.1 EQUIPMENT

4.1.1 Half-face respirators

4.1.2 Full-face respirators

4.1.3 Powered air respirators (Helmet Style respirators and powered air respirators)

4.1.4 Respirators with supplied airline

4.1.5 Self-Contained Breathing Apparatus (SCBA)

APPROVALS	<i>Signature</i>	<i>Date</i>
RSO		
Plant Manager		

5.0 RESPONSIBILITY

- 5.1 The Radiation Safety Officer (RSO) or his designee is responsible for the respiratory protection program and providing technical assistance when needed.
- 5.2 The Radiation/Security Technician (RST) or his designee is responsible for cleaning, maintenance, control, storage and issuance of respirators.

6.0 PREREQUISITE INFORMATION

6.1 *DEFINITIONS*

- 6.1.1 dpm – Disintegrations per minute.

6.2 *FREQUENCY*

- 6.2.1 See section 7.2 for the frequency of inspections.
- 6.2.2 Cleaning of respirator as specified in section 7.3.3.
- 6.2.3 Cleaning of respirators used for emergencies, after each use.

7.0 PROCEDURES

7.1 *POLICY STATEMENT*

- 7.1.1 Energy Fuels Resources respiratory use policy addresses:
 - 7.1.1.1 The use of process or other engineering controls, instead of respirators,
 - 7.1.1.2 The routine, non-routine, and emergency use of respirators, and
 - 7.1.1.3 The length of periods of respirator use and relief from respirator use.

NOTE ON ENGINEERING CONTROLS:

Routine, non-routine, and emergency use of respirators is under the control of the RSO or his designee. Routine use of respirators in different parts of the processing facility is presented in the Energy Fuels Resources Operating Procedures Manual, which specifies what type of respirator is used in which part of the facility. Non-routine use of respirators is designated on a case-by-case basis in the Radiation Work Permits used for specific jobs. When needed, specific respirator types are designated to provide protection against specific hazards. An example might be welding of contaminated metal that would require a HEPA and fume respirator cartridge # P-100.

Emergency use of respirators is dependent on the specific emergency. Self-Contained Breathing Apparatus (SCBA) are available only to authorized users for more threatening emergencies such as entering confined spaces. If the mill foreman determines that an emergency is beyond Energy Fuels Resources ability to respond, the local fire department would be called for assistance as specified in the Emergency Procedure.

The RSO or his designee will evaluate and recommend maximum time of use and rest times for each job or type of job based on factors such as:

- Difficulty of work,
- Protective clothing worn by the respirator user, or
- Temperature, Humidity

7.2 INVENTORY, INSPECTION AND STORAGE

- 7.2.1 Visually inspect at least once a month respirators that are routinely available for issue. If the respirators are stored in plastic bags, the respirators need not be removed from the bags for inspection. Evaluate if the respirators are ready for use. Respirator inspection usually includes a check for tightness of connections and the condition of face pieces, headbands, valves, connecting tubes and canisters. Rubber or elastomeric parts are inspected for pliability and signs of deterioration. Stretching and manipulation rubber or elastomeric parts with a massaging action will keep them pliable and flexible and prevent them from taking a set during storage.
- 7.2.2 Visually inspect and inventory all equipment used in conjunction with face piece respirators such as air-supply hoses prior to use.
- 7.2.3 Visually inspect all Self Contained Breathing Apparatus (SCBA) quarterly. If the SCBA is used for emergencies, visually inspect monthly. Operationally test all SCBA quarterly.
- 7.2.4 Inventory and visually inspect all repair and replacement parts for respirators annually.
- 7.2.5 Permanently and legibly mark breathing air cylinders including SCBA cylinders as “Breathing Air” or “Compressed Breathing Air.”
- 7.2.6 Store cleaned and monitored respirators in areas protected from dust, sunlight, heat, extreme cold, excessive moisture, damaging chemicals, or physical abuse, such as in the bottom of a tool box.
- 7.2.7 Record the number, location, and date of inspections on Form HS-131A or the equivalent.

7.3 CLEANING, MAINTENANCE AND REPAIR OF RESPIRATORS

- 7.3.1 Respirators are to be cleaned, repaired and maintained by personnel who have received on-the-job training or other training on repairing and maintaining respirators. The training will be documented. The RSO or his designee will maintain a list of all personnel trained to clean, maintain, and repair respirators. SCBAs are to be repaired by personnel that have been specifically trained in SCBA repair. Repairs will follow manufacturer’s recommendations for repair.
- 7.3.2 Routinely used respirators are to be collected, cleaned and disinfected to ensure proper respiratory protection of the worker. Respirator users will return respirators for cleaning and/or repair when the interior of the respirator is dirty, when the respirator needs repair, when the cartridges appear to be clogged with debris, or for any reason that would cause the worker to question the use of the respirator. Respirators will be issued for

a maximum of six months before being returned for cleaning and/or repair. Respirators maintained for emergencies are to be cleaned and disinfected after each use.

- 7.3.3 Clean, disinfect, and repair respirators by the following steps:
 - 7.3.3.1 Remove filters cartridges, canisters, speaking diaphragms, and valve assemblies.
 - 7.3.3.2 Wash face-pieces and breathing tubes in a warm cleaner-disinfectant solution such as a quaternary ammonium antibacterial disinfectant, or the equivalent, following instructions for dilution from the disinfectant manufacturer. Avoid water temperatures above 110 degrees Fahrenheit.
 - 7.3.3.3 Use a stiff bristle (not wire) hand brush to facilitate removal of dirt.
 - 7.3.3.4 Rinse completely in warm clean water to avoid user dermatitis.
 - 7.3.3.5 Clean other respirator parts in a warm detergent solution or as recommended by the manufacturer.
 - 7.3.3.6 Hand wipe valves and gaskets with damp, lint free cloth as needed to remove water residues and all foreign materials. Dry other parts.
 - 7.3.3.7 Inspect valves, head-straps, or other parts and replace as needed.
 - 7.3.3.8 Re-assemble the respirators. Install used filters cartridges or canisters if they appear in good clean working condition. The quantitative fit test which tests for leaking cartridges or canisters will be conducted on all used cartridges or canisters for negative pressure respirators prior to reuse. Otherwise use new parts. Make sure the seal is tight.
- 7.3.4 Ultrasonic cleaners and/or dishwashers may be used for cleaning but care must be taken to avoid tumbling, agitation, or exposure to temperature above those recommended by the respirator manufacturer, usually 110 degrees Fahrenheit.
- 7.3.5 Respirator cartridges may be reused only after they have been installed on a respirator, fit tested using the quantitative fit test, and determined not to be leaking.

7.4 MONITORING OF RESPIRATORS

- 7.4.1 Monitor the inside of each cleaned respirator using a release-for-use level of 100 dpm/100 cm² above background for fixed alpha, background for removable alpha activity, and 5000 dpm 100 cm² above background for beta/gamma.
- 7.4.2 Document the number, location of storage, monitoring date and activity readings on the proper form. Record the fixed alpha, beta-gamma, and removable activity of all respirators rejected for use.

7.4.3 Place the cleaned and monitored respirators in plastic bags or the equivalent for storage.

7.5 *ISSUE RESPIRATORS*

7.5.1 The RSO or his designee will issue respirators whenever work is to be done in Airborne Radioactivity Areas, when required by Radiation Work Permits, or when deemed necessary by the RSO or his designee. Properly fitting respirators will only be issued to individuals who are medically able to wear the respirator, those that have been trained in respirator use, and have passed the respirator fit test within the last year. Record who issues the respirator, to whom and when.

7.6 *SUPPLIED AIR AND SCBA AIR QUALITY*

7.6.1 The air supplied to air line respirators and the air in SCBAs is to meet class D air quality standards. The input point for the breathing air compressor is located outside the process buildings and is equipped with filters to reduce any contaminants being drawn in. The air is routed to an air purifier designed to produce class D air.

7.6.2 Prior to using the supplied air check that:

7.6.2.1 The prefilter that removes solid particles, liquid oil and water has not changed color to indicate replacement.

7.6.2.2 The color strips on the desiccant towers have not changed color to indicate failure to remove water.

7.6.2.3 Carbon monoxide levels are less than 10 ppm when using a colorimetric detector tube or a gas analyzer.

7.6.2.4 Objectionable odors or tastes are not detected by the user. If so, replace the activated charcoal filter.

7.6.2.5 The oxygen level is between 19.5 and 23.5 percent using a portable oxygen meter.

7.6.2.6 The carbon dioxide level is less than 1000 ppm using colorimetric tubes or gas analyzer.

7.6.3 Use a checklist to make sure all the above items are checked.

7.6.4 Obtain a certificate or air analysis from the vendor filling the SCBA tanks stating that the fill air meets Grade D air.

Respirator Maintenance, Inspection, Cleaning and Storage
Procedure HS-131

Appendix A

**Respirator Inspection, Maintenance, Cleaning and Storage
Form HS-131A**

Respirator Inspection, Maintenance, Cleaning, and Storage Form

Respirators and SCBA available for use	Serial numbers	location	Tech	
SCBA operationally tested	Serial numbers	location	Tech	
Repair or replacement part	Number of units	location	Tech	Year
Respirators monitored	Number of units	location	Tech	Month, Year
Contamination levels on cleaned and rejected respirators	dpm /100 cm ² Fixed Alpha	dpm/100 cm ² Beta-Gamma	dpm /100 cm ² Removable Alpha	
Limit	100 dpm /100 cm ²	5000 dpm/100 cm ²	Background dpm /100 cm ²	

Respirators and SCBA available for use	Serial numbers	location	Tech	
SCBA operationally tested	Serial numbers	location	Tech	
Quarter, Year				
Repair or replacement part	Number of units	location	Tech	Year
Respirators monitored	Number of units	location	Tech	Month, Year
Contamination levels on cleaned and rejected respirators	dpm /100 cm ² Fixed Alpha	dpm/100 cm ² Beta-Gamma	dpm /100 cm ² Removable Alpha	
Limit	100 dpm /100 cm ²	5000 dpm/100 cm ²	Background dpm /100 cm ²	

Respirator Maintenance, Inspection, Cleaning and Storage
Procedure HS-131

Appendix B

Respirator Issuance Form HS-131B

Respirator Issuance Form

Respirator User	Type Issued/Ser. No.	Date Issued	Issued By
Respirator User	Type Issued/Ser. No.	Date Issued	Issued By
Respirator User	Type Issued/Ser. No.	Date Issued	Issued By
Respirator User	Type Issued/Ser. No.	Date Issued	Issued By
Respirator User	Type Issued/Ser. No.	Date Issued	Issued By
Respirator User	Type Issued/Ser. No.	Date Issued	Issued By
Respirator User	Type Issued/Ser. No.	Date Issued	Issued By
Respirator User	Type Issued/Ser. No.	Date Issued	Issued By
Respirator User	Type Issued/Ser. No.	Date Issued	Issued By
Respirator User	Type Issued/Ser. No.	Date Issued	Issued By
Respirator User	Type Issued/Ser. No.	Date Issued	Issued By
Respirator User	Type Issued/Ser. No.	Date Issued	Issued By
Respirator User	Type Issued/Ser. No.	Date Issued	Issued By
Respirator User	Type Issued/Ser. No.	Date Issued	Issued By
Respirator User	Type Issued/Ser. No.	Date Issued	Issued By

Energy Fuels Resources Piñon Ridge Mill Montrose County, Colorado	MEDICAL EVALUATION FOR RESPIRATOR USE PROCEDURE	Number: HS-132 Page: 1 of 2 Revision: 0 Date: 10/07/09
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1.0 PURPOSE

This procedure provides for medical examinations of Energy Fuels Resources employees at the Piñon Ridge Mill.

2.0 APPLICABILITY

This procedure applies to all employees of the Mill.

3.0 ADMINISTRATION

3.1 REFERENCES

3.1.1 Procedure HS-120 “Respirator User and Fit Test Procedure.”

3.2 APPENDICES

Appendix A – Medical Evaluation Questionnaire Form HS-132A

Appendix B – Medical Determination Form HS-132B

4.0 RESPONSIBILITY

4.1 The Vice President of Regulatory Affairs is responsible for:

4.1.1 Determining the criteria for pre-employment physicals.

4.2 The Radiation Safety Officer (RSO) or designee is responsible for:

4.2.1 Determining the criteria for physicals for respirator users.

4.2.1 Evaluating the results of physicals of respirator users to determine if work restrictions for individual employees are warranted.

4.3 The Safety Officer is responsible for:

4.3.1 Evaluating the results of the pre-employment and employment physicals to determine if work restrictions for individual employees are warranted.

4.3.2 Assuring that personnel considered as key individuals relevant to this procedure are documented as properly trained and/or qualified to perform the required duties.

4.4 The Assistant RSO is responsible for:

4.4.1 Maintaining occupational medical records of current employees.

5.0 PREREQUISITE INFORMATION

5.1 FREQUENCY

5.1.1 Pre-employment physical examination before beginning work.

5.1.2 Annual (at least every 12 months \pm 3 months) medical evaluation of respirator users.

5.1.3 As needed physicals of current employees.

APPROVALS	<i>Signature</i>	<i>Date</i>
RSO		
Plant Manager		

Energy Fuels Resources Piñon Ridge Mill Montrose County, Colorado	MEDICAL EVALUATION FOR RESPIRATOR USE PROCEDURE	Number: HS-132 Page: 2 of 2 Revision: 0 Date: 10/07/09
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6.0 PROCEDURES

6.1 *MEDICAL EXAMINATION CRITERIA*

- 6.1.1 Medical criteria for employment physicals are established by the Vice President of Regulatory Affairs.
- 6.1.2 Medical criteria for physical exams of respirator users are established by the RSO or designee.

6.2 *PHYSICAL EXAMINATIONS*

- 6.2.1 Personnel newly hired by Energy Fuels Resources at the Piñon Ridge Mill are to have a pre-employment physical by a licensed physician or his designee before beginning work.
- 6.2.2 Employment physicals of current employees by a licensed physician or his designee may be ordered by the RSO or designee or Safety Officer on an as needed basis.
- 6.2.3 The results of the pre-employment and employment physicals are to be reviewed by the Safety Officer or his designee for potential work restrictions. If warranted he will implement work restriction for specific individuals.
- 6.2.4 Annually (at least every 12 months \pm 3 months) respirator users are to be evaluated by a licensed physician or his designee for their ability to wear a respirator using the Medical Determination Form HS-132B or its equivalent.
- 6.2.5 The results of the medical evaluation of respirator users are to be reviewed by the RSO or designee for their ability to wear a respirator and for potential work restrictions. If warranted, the RSO or designee may not allow an individual to wear a respirator and/or implement work restrictions for the individuals.

6.3 *RECORDS*

- 6.3.1 Records of medical physical examinations are to be filed with the Safety Department and maintained until license termination.

Medical Evaluation for Respirator Use Procedure HS-132

Appendix A

Respirator Medical Evaluation Questionnaire Form HS-132A

Medical Evaluation Questionnaire

Your employer must allow you to answer this questionnaire during normal working hours, or at a time and place that is convenient to you. To maintain your confidentiality, your employer or supervisor must not look at or review your answers, and your employer must tell you how to deliver or send this questionnaire back to us.

PART A. SECTION 1 (MANDATORY)

The following information must be provided by every employee who has been selected to use any type of respirator (please print).

1. Today's Date:	2. Your Name:		
3. Your age (to nearest year):	4. Sex (circle one): Male Female	5. Your height: ft. in.	6. Your weight: lbs.
7. Your job title:			
8. A phone number where you can be reached by the health care professional who reviews this questionnaire (include the Area Code): ()			
9. The best time to call:	10. Has your employer told you how to contact the health care professional who will review this questionnaire (circle one):		Yes No
11. Check the type of respirator you will use (you can check more than one category)			
<input type="checkbox"/> N, R or P disposable respirator (filter-mask, non-cartridge type only)		<input type="checkbox"/> Other type (for example, half- or full-facepiece type, powered-air purifying, supplied-air, self-contained purifying, supplied air, self-contained breathing apparatus)	
12. Have you worn a respirator If yes, what type(s): (circle one): Yes No			

PART A. SECTION 2 (MANDATORY)

Questions 1 through 9 below must be answered by every employee who has been selected to use any type of respirator (Please circle "yes" or "no")

1. Do you <i>currently</i> smoke tobacco, or have you smoked tobacco in the last month?	Yes	No
2. Have you <i>ever had</i> any of the following conditions?		
a. Seizures (fits):	Yes	No
b. Diabetes (sugar disease):	Yes	No
c. Allergic reactions that interfere with your breathing:	Yes	No
d. Claustrophobia (fear of closed-in places):	Yes	No
e. Trouble smelling odors:	Yes	No
3. Have you <i>ever had</i> any of the following pulmonary or lung problems?		
a. Asbestosis:	Yes	No
b. Asthma:	Yes	No
c. Chronic bronchitis:	Yes	No
d. Emphysema:	Yes	No
e. Pneumonia:	Yes	No
f. Tuberculosis:	Yes	No
g. Silicosis:	Yes	No
h. Pneumothorax (collapsed lung):	Yes	No
i. Lung cancer:	Yes	No
j. Broken ribs:	Yes	No
k. Any chest injuries or surgeries:	Yes	No
l. Any other lung problem that you've been told about:	Yes	No

4. Do you <i>currently</i> have any of the following symptoms of pulmonary or lung disease?		
a. Shortness of breath:	Yes	No
b. Shortness of breath when walking fast on level ground or walking up a slight hill or incline:	Yes	No
c. Shortness of breath when walking with other people at an ordinary pace on level ground:	Yes	No
d. Shortness of breath when walking at your own pace on level ground:	Yes	No
e. Have to stop for breath when washing or dressing yourself:	Yes	No
f. Shortness of breath that interferes with your job:	Yes	No
g. Coughing that produces phlegm (thick sputum):	Yes	No
h. Coughing that wakes you up early in the morning:	Yes	No
i. Coughing that occurs mostly when you are lying down:	Yes	No
j. Coughing up blood in the last month:	Yes	No
k. Wheezing:	Yes	No
l. Wheezing that interferes with your job:	Yes	No
m. Chest pain when you breathe deeply:	Yes	No
n. Any other symptoms that you think may be related to lung problems:	Yes	No

5. Have you <i>ever had</i> any of the following cardiovascular or heart problems?		
a. Heart attack:	Yes	No
b. Stroke:	Yes	No
c. Angina:	Yes	No
d. Heart failure:	Yes	No
e. Swelling in your legs or feet (not caused by walking):	Yes	No
f. Heart arrhythmia (heart beating irregularly):	Yes	No
g. High blood pressure:	Yes	No
h. Any other heart problem that you've been told about:	Yes	No
6. Have you <i>ever had</i> any of the following cardiovascular or heart symptoms?		
a. Frequent pain or tightness in your chest:	Yes	No
b. Pain or tightness in your chest during physical activity:	Yes	No
c. Pain or tightness in your chest that interferes with your chest:	Yes	No
d. In the past two years, have you noticed your heart skipping or missing a beat:	Yes	No
e. Heartburn or indigestion that is not related to eating:	Yes	No
f. Any other symptoms that you think may be related to heart or circulation problems:	Yes	No
7. Do you <i>currently</i> take medication for any of the following problems?		
a. Breathing or lung problems:	Yes	No
b. Heart trouble:	Yes	No
c. Blood pressure:	Yes	No
d. Seizures (fits):	Yes	No
8. If you've used a respirator, have you <i>ever had</i> any of the following problems? (If you've never used a respirator, go to Question 9)		
a. Eye irritation:	Yes	No
b. Skin allergies or rashes:	Yes	No
c. Anxiety:	Yes	No
d. General weakness or fatigue:	Yes	No
e. Any other problem that interferes with your use of a respirator:	Yes	No
9. Would you like to talk to the health care professional who will review this questionnaire about your answers to this questionnaire?	Yes	No

Questions 10 to 15 below must be answered by every employee who has been selected to use either a full-facepiece respirator or a self-contained breathing apparatus (SCBA). For employees who have been selected to use other types of respirators, answering these questions is voluntary

10. Have you <i>ever lost</i> vision in either eye (temporarily or permanently)?	Yes	No
11. Do you <i>currently</i> have any of the following vision problems?		
a. Wear contact lenses:	Yes	No
b. Wear glasses:	Yes	No
c. Color blind:	Yes	No
d. Any other eye or vision problem:	Yes	No
12. Have you <i>ever had</i> an injury to your ears, including a broken ear drum?	Yes	No
13. Do you <i>currently</i> have any of the following hearing problems?		
a. Difficulty hearing:	Yes	No
b. Wear a hearing aid:	Yes	No
c. Any other hearing or ear problem:	Yes	No
14. Have you <i>ever had</i> a back injury?	Yes	No
15. Do you <i>currently</i> have any of the following musculoskeletal problems?		
a. Any weakness in your arms, hands, legs or feet:	Yes	No
b. Back pain:	Yes	No
c. Difficulty fully moving your arms or legs:	Yes	No
d. Pain or stiffness when you lean forward or backward at the waist:	Yes	No
e. Difficulty fully moving your head up or down:	Yes	No
f. Difficulty fully moving your head side to side:	Yes	No
g. Difficulty bending at your knees:	Yes	No
h. Difficulty squatting to the ground:	Yes	No
i. Climbing a flight of stairs or a ladder carrying more than 25 lbs:	Yes	No
j. Any other muscle or skeletal problem that interferes with using a respirator:	Yes	No

COMMENTS (IF ANY):

EMPLOYMENT EXAMINATION CONSENT

I, _____ understand that the information discovered during this examination will be considered confidential unless specifically released by me.

However, I also understand that certain information *must* be reported to my employer, to governmental agencies or to coworkers in situations similar to my own (for example, results of testing to determine my exposure to a hazardous chemical) Other than information for which there is a requirement to divulge, nothing which identifies me individually may be released, except as indicated below, without my specific permission.

I understand and hereby give my consent that information about my ability to perform my job safely may be reported to my employer or prospective employer. This information may include:

- Medical recommendations, based on my employment and periodic evaluations, regarding my work capability and any necessary work restrictions.
- Medical conditions that would directly affect my safety, the safety of others, or my job performance.
- The duration and extent of any medical restrictions placed on my work activities.

I understand that medical information revealed on this examination may be communicated to the physician(s) acting as corporate occupational medical director(s) for my employer. I do not give permission for any further or subsequent release of the information by the recipient.

I understand that my employer and my employer's workers' compensation carrier may review the information in my medical record at any time in the event I claim that an injury or illness is caused or worsened by my job.

Signature

Date

Location

Medical Evaluation for Respirator Use Procedure HS-132

Appendix B

Medical Determination Form HS-132B

MEDICAL DETERMINATION

Name: _____ Date [mm/dd/yy]: _____

Employee ID/SSN: _____ Date of Birth [mm/dd/yy]: _____

Department: _____

This is an exit exam This is an initial exam This is an annual exam

Check type or types of respirator(s) to be used:

- | | |
|--|--|
| <input type="checkbox"/> Air-Purifying (non-powered) | <input type="checkbox"/> Combination Air-Line and SCBA |
| <input type="checkbox"/> Powered Air Purifying Respirator (PAPR) | <input type="checkbox"/> Open Circuit SCBA |
| <input type="checkbox"/> Continuous-Flow Air-Line Respirator | <input type="checkbox"/> Closed Circuit SCBA |
| <input type="checkbox"/> Pressure Demand Air-Line Respirator | <input type="checkbox"/> Combination Air-Line and SCBA |
| <input type="checkbox"/> Combination Continuous-Flow Air-Line and Air-Purifying Respirator | |
| <input type="checkbox"/> Combination Pressure Demand Air-Line and Air-Purifying Respirator | |

Select Level of Work Effort:

- Light
- Moderate
- Heavy
- Strenuous

Duration and Frequency of Respirator Use:

- On a daily basis
 - Occasionally - but more than once a week
 - Rarely - or for emergency situations only
- Length of Time of Anticipated Effort (Hours): _____

Respirator Use:

- No restrictions on respirator use
 - Some specific use restrictions (specify below)
 - No respirator use permitted
- Follow-up evaluation needed Yes No

Hazardous Materials Work:

- No restrictions on full participation in hazardous materials/hazardous waste work.
- Has medical limitations that restrict full participation in hazardous materials/hazardous waste work. See work function limitations listed in "Restrictions".

Hearing:

- Hearing loss not noted.
 - Comparison with prior audiogram shows no significant change.
 - There is no prior audiogram for comparison.
- Hearing loss noted. There is a significant change from prior audiogram.
 - This represents an STS in speech frequencies.
 - This represents an STS in the 4K to 6K high frequency range.

Restrictions: _____

The above employee has been provided a copy of this evaluation: Yes No

Name and Title of evaluator: _____

Signature: _____

Respirator Program Administrator: _____ Date: _____

Energy Fuels Resources Piñon Ridge Mill Montrose County, Colorado	AIR QUALITY SURVEYS NON-RADIOLOGICAL PROCEDURE	Number: HS-140 Page: 1 of 2 Revision: 0 Date: 10/07/09
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1.0 PURPOSE

The purpose of this procedure is to identify procedures and surveys necessary to assess the adequacy of control measures in the workplace

2.0 SCOPE

The procedure is designed to comply with MSHA Part 56 standards for air quality and will be applicable to all areas of the facility.

3.0 RESPONSIBILITY

- 3.1 Managers shall be responsible for implementing the Air Quality Surveys Non-Radiological Procedure.
- 3.2 Supervisors shall ensure that control equipment is maintained and kept functional at all times.
- 3.3 The Safety Department shall develop and maintain the Air Quality Surveys Non-Radiological Procedure and perform the necessary sampling and observations to ensure compliance with the procedure

4.0 PROCEDURE

- 4.1 Initial surveys to determine potential exposure to dusts, mists and fumes will be conducted throughout the milling facility. Contaminants to be sampled for include, but are not limited to:
 - 4.1.1 Silica Dust
 - 4.1.2 Nuisance Particulates
 - 4.1.3 Sulfur Dioxide
 - 4.1.4 Carbon Dioxide
 - 4.1.5 Ammonia Fumes
 - 4.1.6 Welding Fumes
 - 4.1.7 Vanadium Compounds
- 4.2 All methods of sampling will be consistent with established scientific principles such as NIOSH recommended methods.
- 4.3 If initial sampling does not indicate exposures levels that exceed the permissible limits found in the 1973 ACGIH TLV booklet, then repeat sampling will only be necessary at six (6) month intervals.
- 4.4 All control measures must be maintained in a condition to assure that employees are not exposed to harmful concentrations of airborne contaminants. If feasible, engineering controls do not reduce exposure to acceptable levels a respiratory protection program will be initiated.

APPROVALS	<i>Signature</i>	<i>Date</i>
RSO		
Plant Manager		

4.5 ***TOTAL DUST MEASUREMENTS (Includes Vanadium Compounds)***

- 4.5.1 Total dust measurements are taken using a personal dust sampler without the cyclone assembly in the sampling train.
- 4.5.2 All airborne particles or “total dust” are measured.
- 4.5.3 The TLV for total dust is 10 mg/m³.
- 4.5.4 If dusts associated with this sampling have a free silica content of 1% or more the sampling must be done using the respirable dust sampling procedure.
- 4.5.6 Analysis for other contaminants of concern can be done on the dust captured on the filter and the appropriate TLV’s can be assigned.

4.6 ***SAMPLING FOR SILICA DUST (Respirable Dust Sampling)***

- 4.6.1 The Threshold Limit Value (TLV) is 1% of total dust in the sample and the amount of total dust in sample will vary from sample to sample. The TLV will generally be in the range of 0.1 to 3.3 mg/m³.
- 4.6.2 Personal respirable dust sampling must be conducted to determine the concentration of dust in the breathing zone of the worker.
- 4.6.3 The respirable dust collected on the filter will be analyzed for free silica content and the appropriate TLV will be determined from this analysis.
- 4.6.4 For respirable dust sampling a cyclone assembly is required in the sampling train.

4.7 ***WELDING FUME SAMPLING***

- 4.7.1 Sampling will be done during welding operations by placing the filter cassette in a position that will be inside the welding helmet when the helmet is placed down.
- 4.7.2 The potential contaminants include metal fumes and toxic gases and the material collected on the filter can be analyzed for the contaminants of concern and the appropriate TLV determined from that analysis.

4.8 ***OTHER AIR QUALITY MONITORING***

- 4.8.1 Sampling to determine adequate oxygen levels will be done using an oxygen monitor and must be performed anytime confined space entries will be made.
- 4.8.2 Sampling for toxic gases, flammable gases, carbon dioxide, carbon monoxide, etc. will be performed using equipment adequate to determine the hazardous levels of these gases.
- 4.8.3 Sampling for ammonia and sulfur dioxide will also be performed using the appropriate sampling equipment.