

◆ROYAL OAK MINES INC.

Yellowknife Division - Giant Mine

MEMO TO: H. Starkes/S. Hamilton/J. Keenan

CC: D. Dickson/Safety Department/Mill Shifters/
Cottrell/T. Burkholder

FROM: G. Halverson

DATE: April 13, 1993

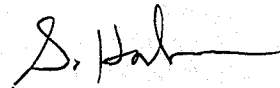
SUBJECT: ACCESS TO COTTRELL AND BAGHOUSE - ARSENIC TRIOXIDE
SAFETY PROCEDURES

Please ensure your employees review the procedures for working in the Cottrell/Baghouse area in a safety huddle. These procedures have been developed to meet concerns with regard to personnel not from the Mill Department and also to assist the Mill personnel.

It is important also that your employees fully understand the need for these guidelines and that they must follow them when work is to be performed in the above areas. Authorization must be given by the Mill Supervisor prior to any work being started and employees briefed to the special requirements of the area.

Any employees found in these areas and not authorized, will be considered leaving their work area and could be subject to discipline by their supervisor who would be notified by Mill Supervision.

Thank you for your co-operation in this matter.



G. B. Halverson
Mill Superintendent

GBH/cjs

ROYAL OAK MINES INC.
Yellowknife Division - Giant Mine

Arsenic Trioxide
Safety Procedures
and
General Information
for
Mine and Mill Personnel

ORIGINAL - November 1986
REVISION 1 - December 1986
REVISION 2 - June 1987
REVISION 3 - February 1992

Copies of this document will be distributed to the following areas:

- 1) Mill Superintendent
- 2) Safety Superintendent
- 3) Mine Superintendent
- 4) Maintenance Foreman
- 5) Cottrell/Baghouse
- 6) Mill Shift Supervisor's Office
- 7) Manager of Environmental Affairs

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Cottrell and Baghouse Safety Procedures - Arsenic Trioxide

1.0 Arsenic Trioxide General Information:

See MSDS sheets for more detail than the following information.

1.1 General Description:

White powder - odourless

The two forms of arsenic trioxide are:

Organic - naturally occurring in fish, shellfish, vegetables, etc.

Inorganic - rock, soil, etc.

1.2 Fire:

Not combustible, but when heated over 200° C, it gives off gas/fumes as arsenic trioxide.

1.3 Reactivity:

Does not react with water but is highly soluble. It reacts with acids to form arsine (AsH_3), a highly toxic gas.

1.4 Environmental:

Must not be allowed to enter waterways, bodies of water, or water intakes. Accumulation in shellfish is a known example of food chain concentration potential.

1.5 Hazard:

Arsenic is considered a poison and ingested in sufficient quantities may cause illness and/or death. Suitable precautions must always be taken to avoid accidental contamination of foods and beverages. Be aware that tobacco is a source of arsenic and is synergistic.

1.6 Adsorption:

The dust of arsenic trioxide is irritating to the skin and mucous membranes. Should dust get directly on the skin, especially moist skin or areas where clothing rubs, irritation will develop and the skin will become red and sore. It can be absorbed through broken skin, but normally it does not absorb well.

1.7 Inhalation:

Should the dust be inhaled repeatedly, a sore spot may develop inside the nose, on the septum, the partition between the nostrils. If the dust is inhaled through the mouth there may be irritation to the throat. Because arsenic trioxide is irritating, it would be highly unlikely that a person would ever inhale enough dust to cause poisoning of the whole body. There have been no reports of inhalation poisoning by arsenic in all the years arsenic trioxide has been used in industry.

1.8 Injection:

N/A.

1.9 Ingestion:

80% of the arsenic we ingest we absorb through the GI tract by exposure to dust, contaminated food, beverages, smoking, nail biting, poor personal hygiene with regard to work clothing not being kept clean, washing habits, etc.

1.10 First Aid Measures:

Absorption (skin contact) - change clothing, wash skin where affected, shower if required (cool shower first and then warm, use lots of soap, and dry thoroughly).

Inhalation (severe) - remove person from area (ensure respiratory protection is worn). Maintain breathing passages are kept open, keep person warm, transport to physician immediately.

Ingestion (severe) - cause vomiting by using water, milk, or Milk of Magnesia, take person to physician immediately.

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Cottrell and Baghouse Safety Procedures

2.0 Personal Protective Equipment List:

The following is a reference list of protective equipment available and in use in the Cottrell and Baghouse.

- 2.1 Style 6142 P-11 Zipper Coveralls: No side openings, no belt, but with front and rear pocket.

Supplier: Reynolds Manufacturing, Edmonton, Alberta

- 2.2 Polarmate Dust Suite TD 1881: Zippered cuffs and pant leg bottom with a parka style hood.

Supplier: Safety Supply Canada, Edmonton, Alberta

- 2.3 Dust Hood TD 2768: Air supplied, waist length, bib front, and back with tie and velcro fasteners. Fibre head gear with hose attachment for air and kwik-clip connector.

Supplier: Safety Supply Canada, Edmonton, Alberta

- 2.4 Bullard Compressed Air Hood: Complete with regulator, used when sandblasting.

Supplier: Levitt Safety Limited, Edmonton, Alberta

- 2.5 Welding Hood 3M Welding #2-5003: Includes liftable faceshield, Nomex inner shroud, leather outer shroud, head suspension, comes with air supply hose.

Supplier: Safety Supply Canada, Edmonton, Alberta

- 2.6 Gas and Dust Respirator Survivair: Half mask respirator, series 2000, in large, medium, and small sizes. Filter retainer #1400-76. Pre-filter for dusts and mists #1010-00/TC-2K-232. Chemical cartridges for vapours and gases MSHA/MIDSM approved #TC-23C-318.

Supplier: Levitt Safety Limited, Edmonton, Alberta

- 2.7 3M Disposal Dust Masks #8710:

- 2.8 Cotton Gloves:

2.9 Skin Protection:

2.9.1 Barrier Cream:

Barriere A&H/silicone skin creme
Atrix/triple action hand creme
Nivea Creme/softens and protects
Ply #6/skin protection creme
Fend/protection from contact irritants

2.9.2 Rash Relief Cream:

Rhuli Cream/relieves skin irritations
Collinum/soothing eye lotion
Ozonol Ointment/burns and rashes

2.10 Racal Air Stream Helmet: Includes: pre-filter #AS22-3, main filter #AS23-3, visor #AS75, standard face seals #AS117, small face seals #AS118, motor housing #AS4-3, air flow indicator #AS144, battery pack #AS-3.

2.11 Air Supply Del Monox Air Filtration System: Consists of pre-filter #150, catalyst purifier #C-20, air dryer desiccant, final filter #BA12.

Supplier: Leslie Air Inc.

Headers are located at:

- Del Monox System - bottom floor Cottrell
- bottom floor Cottrell
- top floor Cottrell
- outside Cottrell (for sandblasting)
- Baghouse bottom floor
- Baghouse north and south catwalks
- inside arsenic silo building
- inside load out building
- temporary line run to roaster for clean outs

2.12 Personal Protective Equipment:

To keep dust off the skin, long cotton underwear, coveralls, cotton gloves, and high shoes or boots should be worn. The sleeves and legs of the coveralls should be taped or wrapped around wrists and ankles respectively, without being too tight. Rhuli Cream or Calamine Lotion (without phenol) or zinc oxide powder or suitable commercial protective creams afford some protection to the face and other exposed areas of skin. Workmen must have showers after removing their work clothes and before donning their street clothes. Also, anytime during the shift, should shower and change work clothes if contaminated.

To prevent dust inhalation, workers should use dust respirators and air supply dust hoods. Respirators with rubber face pieces rub on the skin and encourage perspiration and skin irritation. The extent of personal protective measures will depend on the amounts of dust to which workmen are exposed and on the length of time of such exposure. Skin and nose irritations, even minor ones, are a signal that protective measures are not good enough and care should be taken.

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Cottrell and Baghouse General Personal Hygiene Instructions

- 3.0 Cottrell Lunchroom: Provided as a clean area for work breaks. This area must be kept thoroughly clean on a daily basis. The ante room is designed to provide an air lock type seal, provided the lunchroom door is kept closed while the ante room door is opened. The lunchroom is pressurized with filtered air. The air filter equipment is maintained by the Cottrell Operator.
- 3.1 Food and/or beverages must be consumed in the lunchroom only.
- 3.2 Smoking in the Cottrell/Baghouse areas is not recommended. Tobacco has been found to be synergistic. It may cause the toxic effects of any contaminants to be multiplied.
- 3.3 Before leaving the work area and/or entering the lunchroom, remove coveralls and clean foot wear thoroughly. Do not shake your coveralls out, it could contaminate your clean work clothes. Wash your hands, face, neck, and dry thoroughly. Shower if necessary.
- 3.4 Wear cottrell issue coveralls in these areas at all times to keep your work clothes clear of contaminants and to avoid carrying dust from one area to another. Seal cuffs and pant legs.
- 3.5 Do not wear contaminated coveralls, clothing, or boots to other areas of the plant or surface departments.
- 3.6 Wash all exposed skin well should it become contaminated, or shower in the Cottrell dry if required. Do not wait until the end of the shift or transport dust to another area. Wear barrier creams during your work. Re-apply as required after washing.
- 3.7 Employees who work or have worked in the Cottrell/Baghouse areas must shower before going home at the end of their shift, cool water first and then warm water, using lots of soap. Should these workers come from another department, and showering is going to occur at the Cottrell dry, make arrangements with your immediate supervisor prior to start of the shift or work.
- 3.8 Keep your work clothes clean. They must be changed and washed daily if working in this area.
- 3.9 Keep your street clothes and work clothes separate.
- 3.10 When removing and washing your work clothes/coveralls, AVOID shaking them. This is to avoid potential dust from being disturbed and inhaled.

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Cottrell/Baghouse General Safety Instructions

- 4.0 When working inside the Cottrell and Baghouse compartments, dust hoods with air supply, coveralls or dust suits, and gloves, must be worn until the dust conditions are reduced to where a respirator and coveralls provide adequate protection. Baghouse overhaul, Cottrell overhaul, all other conditions would require air supply dust hoods, coveralls/suits, gloves, etc.
- 4.1 Ensure dust hoods, suits, and all related apparatus are maintained in good condition, and replacement parts are ordered in time. The Cottrell Operator is responsible to ensure this is done.
- 4.2 Clean the area on a regular basis by vacuuming/washing frequently to minimize any dust, etc., and reduce contamination potential.
- 4.3 Minimize airborne dust when doing repair work. Clean up prior to start of a job, as required during the job, and after the job is complete.
- 4.4 When working on arsenic contaminated parts from the Baghouse/Cottrell, a dust mask must be worn or Survivair respirator for protection.
- 4.5 Always wear a dust respirator when entering the Baghouse building to avoid entering into a potentially contaminated atmosphere unknowingly and being subjected to exposure. Be safe - be sure.
- 4.6 Arsenic/dust/SO₂ emissions could be present during and after a power outage. Wear a cartridge respirator during and for at least one hour after the power has been restored to avoid exposure.
- 4.7 Sandblasting: Always wear the appropriate Bullard hood, coveralls, gloves (leather). All hoses should have whip-check installed on the ends.
- 4.8 Coveralls and gloves are laundered on a daily basis by the Cottrell Operator and by other personnel as required.
- 4.9 Del Monox air purifier system is maintained on a scheduled basis by the Cottrell Operator as per manufacturer recommendations.
- 4.10 Wear coveralls over your work clothes at all times. This will minimize or stop potential contamination of work clothes. Hang up/store coveralls in the area when you leave. Do not carry dust from this area to another.
- 4.11 Operating reports should indicate conditions during which arsenic dust may be excessive. All arsenic exposure hazards should be eliminated and reported as soon as possible.

- 4.12 No eating or drinking or storing of food or beverages is allowed in this area. Use the lunchroom.
- 4.13 Unauthorized personnel should not be entering the Cottrell/Baghouse areas without approval from their supervisor and notification of the Mill Supervisor prior to their working in the area. Conditions may warrant special procedures, check with Mill Supervisor first.

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5.0 Cottrell Safety Instructions

Confining remarks only to gas, arsenic, and dust and shutdown of the E.S.P.

- 5.1 On a minor maintenance problem such as fixing a short, door hammer, etc., the employee must wear coveralls, gloves, respirator for acid, gas, and dust. Heat resistant mitts may also be required. (Ground out procedure to be followed at all times.)
- 5.2 On major overhauls which require entry into the units, electrode replacement, insulators, etc. Prior to the unit being cleaned, coveralls, dust hoods, and gloves must be worn. Dust and gas respirators may also have to be worn in conjunction with the dust hood.
- 5.3 Major overhaul after the unit is cleaned - coveralls, respirators (not dust masks) with gas and dust cartridges must be worn also gloves.
- 5.4 Personal working outside the unit should be dressed as per 5.1.
- 5.5 Working on screw conveyors: Prior to the conveyor and surrounding area being cleaned and the potential of dust being dumped from the access hatch, dust hoods, coveralls, and gloves must be worn. Once the area is cleaned of contaminants, coveralls, respirators, and gloves may be worn provided conditions allow this. Should it be necessary to continue to wear dust hoods, they must be worn. Racal helmets can sometimes be worn once the area is cleaned.
- 5.6 Clean the high vacuum system: Wear coveralls, gloves, and a respirator. Seal the drums and identify its contents.

Cottrell ELECTRICAL safety instructions for shutdown of the E.S.P.

- 5.7 The high voltage necessary for the operation of a electrostatic precipitator or ESP is dangerous and must be treated with extreme care and caution. An arc of 6" - 8" can be drawn from any part of the high voltage system. It is not necessary to make actual contact with these parts to receive a fatal shock. Stable charges accumulate in the high voltage electrical system and remain there after the power is shut off the equipment.

Before performing any work or approaching any danger point, the following procedures must be followed:

- 5.8 De-energize all rectifier systems as per page 3 - 3.1 of the Cottrell operating instruction manual under section TO SHUTDOWN THE PRECIPITATOR.

- 5.9 Disconnect the 550 V transfer power source by setting the knife gate disconnect in the neutral position (center) and lock it out.
- 5.10 Throw the high voltage switch to the ground position lock the switch in the ground position.
- 5.11 Ground the high voltage system by means of portable ground chains/cable at all locations where equipment is to be approached. First clamp the chain or cable to grounded steel work, then using the fibreglass pole attach or hook the other end of the chain or cable to the part requiring grounding.

These precautions must be observed at all times before:

- a) Entering rectifier and transformer enclosure.
- b) Cleaning line insulation.
- c) Cleaning precipitator insulation.
- d) Making adjustments inside of the precipitator.
- e) Making contact with any of the high voltage parts (I.E.: dust shorts, electrode shorts, etc.)

Once the high voltage system is properly/thoroughly grounded, it is safe to proceed to do work on it.

- 5.12 Never enter a precipitator while alone in the plant. Always have someone in attendance.
- 5.13 A safety belt and life line must be worn and securely fastened before entering a precipitator.
- 5.14 Be sure all workmen are out of the precipitator, failure to do this may be fatal.

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6.0 Baghouse Safety

Confining remarks to gas, dust, arsenic, and lockout.

- 6.1 Prior to entering this area, dust and gas protection must be worn. Potential for unknown hazards exist. Ensure this is done.
- 6.2 When entering a Baghouse compartment for inspection, dust evacuation, bag removal, machining, etc., employees must have someone in attendance to observe and assist if needed.
- 6.3 Employees entering a Baghouse compartment must wear a dust hood, dust suit or coveralls, gloves, sealed cuffs and ankles, and boot covers if needed.
- 6.4 Employees working outside the compartment assisting personnel inside the compartments or performing other required tasks (greasing, lubrication, damper checks, etc.) must wear coveralls, gloves, and acid/dust respirator.
- 6.5 Once the compartment is ready to receive new machinery and bags into, the same equipment as 6.3 must be worn.
- 6.6 When working on screw conveyors (replacement of bearings, couplings, conveyors) employees must wear equipment as per 5.5 Cottrell Screw Conveyors.
- 6.7 Fuller Kinyon Pump - employees must wear dust hood, coveralls, gloves, and boot covers when pump is first opened. Use the high vacuum system to clean and remove arsenic. The dust respirator, coveralls, and gloves may be worn with barrier cream.
- 6.8 Employees must shower at the end of their shift prior to going home and may be required to shower during the shift if contaminated. See section on Personal Hygiene.
- 6.9 No eating, drinking, storage of food or beverages is allowed in this area.
- 6.10 Follow proper lockout procedures where required at all times as per current policy.

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7.0 Cottrell/Baghouse Safety Procedures - Mechanical

Prior to any work being started, whenever possible, the Cottrell Operator will clean up any spillage as required.

7.1 Authorization to enter and work in this area must be given by the immediate supervisor and Mill Supervisor prior to any work being performed.

7.2 Mechanics must be educated in the properties and hazards of arsenic, P.P.E. required, personal hygiene procedures, etc., in this manual. This will be done by their immediate supervisor prior to working in these areas.

7.3 Mechanics will follow the procedures as indicated in sections 2, 3, 4, 5, and 6 with regard to dust, gas, and arsenic and follow proper lock out procedures for any equipment they are working on that requires a lock out.

7.4 When assigned to these areas for two hours or more, mechanics will take their scheduled work breaks at the Cottrell lunchroom. Once the work and/or shift is completed or should it be necessary to leave the area, follow rules 3.7, and 3.8. Do not use this as an excuse to have your work break elsewhere. Footwear must also be clean, should you be required to leave the area.

7.5 Ensure your tools are cleaned properly before removing them from the work area, at the completion of the work and/or shift, to avoid contamination of other areas.

7.6 Showering see section 3.8.

7.7 No unauthorized personnel allowed in these areas. Prior to starting work in these areas, approval must be given by your supervisor and the Mill Supervisor. Conditions may be present which could require special procedures.

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8.0 Cottrell/Baghouse Safety Procedures - Electrical

This is to assist any electrical department employee to avoid exposure to dust, gas, and/or arsenic in these areas.

Prior to any work being started, whenever possible, the Cottrell Operator will clean up any spillage as required.

- 8.1 Authorization to enter and work in these areas must be given by the immediate supervisor and Mill Supervisor, PRIOR TO ANY WORK BEING PERFORMED.
- 8.2 Electricians must be educated in the properties and hazards of arsenic, P.P.E. required, personal hygiene procedures, etc., in this manual. This will be done by their immediate supervisor prior to working in these areas.
- 8.3 Electricians will follow the procedures as indicated in sections 2, 3, 4, 5, and 6 with regard to dust, gas, and/or arsenic and follow proper lock out procedures as required.
- 8.4 When assigned to these areas for two or more hours, electricians will take their scheduled work breaks at the Cottrell lunchroom. Once the work and/or shift is completed, or should it be necessary to leave the area, follow rules 3.7 and 3/8. Do not use this as an excuse to have your break elsewhere. Footwear must also be clean.
- 8.5 Ensure all tools, equipment, etc., are cleaned before removing from the work area at the completion of the work and/or shift.
- 8.6 Showering see section 3.8.
- 8.7 No unauthorized personnel allowed in these areas. Prior to starting work in these areas, approval must be given by your supervisor and the Mill Supervisor. Conditions may be present which could require special procedures.

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9.0 Cottrell/Baghouse Safety Procedures - Welding

This is to assist any welder working in this area to avoid exposure to dust, gas, and/or arsenic.

Prior to the start of any work, whenever possible, the Cottrell Operator will clean up any spillage as required to ensure a clean safe work area.

- 9.1 Authorization to enter and work in this area must be given by the immediate supervisor and Mill Supervisor, PRIOR TO ANY WORK BEING PERFORMED.
- 9.2 Welders must be educated in the properties and hazards of arsenic, P.P.E. required, personal hygiene procedures, etc., in this manual prior to their working in this area. This will be done by their immediate supervisor.
- 9.3 Welders will follow the procedures outlined in sections 2, 3, 4, 5, and 6 as they apply to them with regard to dust, gas, and/or arsenic and follow proper lock out procedures for any equipment they are working on that requires a lock out.
- 9.4 The welder will wear in addition to the required P.P.E. coveralls, gloves, etc., the 3M #2-5003 welding hood and ear plugs when working in the Baghouse area and where required in the Cottrell areas. Air supplied Del Monox air purification system - adjust helmet to fit your head prior to use, wear 8710 mask.
- 9.5 The welder is responsible to ensure the welding hood is maintained and, at the end of each shift, it is thoroughly cleaned and stored properly.
- 9.6 When assigned to these work areas for two or more hours, welders will take their work breaks at the Cottrell lunchroom. Once the work and/or shift is completed or should it be necessary to leave the area, follow rules 3.7 and 3.8. Do not use this as an excuse to have your work break elsewhere. Footwear must also be clean.
- 9.7 Ensure all tools and equipment is cleaned properly before removing from these areas at the completion of the work and/or shift.
- 9.8 Showering see section 3.8.
- 9.9 No unauthorized personnel allowed in these areas. Prior to starting work in these areas, approval must be given by your supervisor and the Mill Supervisor. Conditions may be present which could require special procedures.

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10.0 Safety Procedures For Working On Arsenic Lines

Based on plans to start to work on lines in stope at 8:00 a.m.

- 10.1 Finish pumping out Baghouse by 4:00 a.m. *→ Blow AS. line 10 mins* and shut off all air, lock out Baghouse blower with department lock and break four inch line outside Baghouse to vent line approximately 1 - 2 hours after completion of pumping. Mark on sheet and leave sheets in control room.
- 10.2 At 7:45 a.m., Cottrell Operator checks pressure on fill line and return line to see if zero. Note on report sheet.
- 10.3 Underground Foreman to notify Mill Foreman that underground personnel will pick up necessary safety gear at Cottrell. Check with Cottrell Operator to see if it is safe to work on line prior to starting work. Or, if gear is not required, notify Mill Foreman prior to starting work.
- 10.4 Underground crew is to loosen a bolt on the inspection cover to the stope to see if any pressure is present. If okay, work may proceed on the arsenic line.
- 10.5 Line to be pressure tested to 100 psig prior to start up by capping last coupling worked on in line. Line must be inspected by the underground crew for leaks while under pressure.
- 10.6 The Underground Department is responsible to inform the Mill Supervisor that the work is complete so the Baghouse blower can be unlocked and pumping of arsenic can commence.
- 10.7 After starting, the underground personnel should walk the line to check, especially where it was capped.
- 10.8 Underground Shift Supervisor to ensure safety gear is worn, including dust masks, coveralls, and gloves while working on lines.
- 10.9 Any personnel required to inspect or visit the arsenic areas must be authorized by the Mine Foreman.

It will require hard work and close co-operation to eliminate all arsenic exposure hazards, but we are determined that it shall be done. It the interest of your health and safety, these rules will be strictly enforced.

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11.0 Safety Procedures For Plugged Lines

- 11.1 The General Mill Foreman or his designate is to call the Mine Foreman on line plugs.
- 11.2 If a line plugs and is blown successfully, underground must be informed prior to recommencing of pumping.
- 11.3 The General Mill Foreman will inform the Mine Foreman of the line plug that has been blown with 100 psig. Use the bypass system to do this.
- 11.4 Pumping will recommence after the Mine Foreman informs the General Mill Foreman that the underground line has been inspected and found to be in satisfactory condition to recommence pumping.
- 11.5 After blowing a line plug, the Underground Department should be informed before restarting in order that they may walk the line to check for leaks or breaks.

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12.0 Safety Procedures For New Lines

- 12.1 Prior to utilizing new lines for pumping of arsenic, all lines are to be pressure tested with 100 psig air at the Cottrell building and checked by the Underground Shift Supervisor.
- 12.2 Close liaison will be required between the General Mill Foreman and the Mine Foreman.
- 12.3 Prior to start up of any new underground lines, the lines will be inspected by the Underground Supervisor for any possible deficiency before use.
- 12.4 If 90° bends are required, only long sweep elbows are to be used. Prior to any arsenic line being work on:
- the line must be blown clean of arsenic
 - wait 4 hours for the line to depressurize
 - take the line apart on surface to check item #2
 - underground is to check the inspection port for zero pressure

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13.0 Procedure For Pumping The Baghouse

- 13.1 Check oil level and cooling water for flow. Add oil as needed.
- 13.2 Start blower for Fuller Kinyon pump. Open 2" valve to PRV (pressure regulating valve) which adds air to the 4" arsenic line. The PRV should be preset at approximately 15 psi, and the 2" discharge valve should be approximately half open (preset).
- 13.3 Start Fuller Kinyon pump. Start cross conveyor.
- 13.4 Start #4 conveyor. NOTE: the lever on Fuller Kinyon pump should rise indicating that pumping has started.
- 13.5 Run the #4 conveyor until lever drops (approximately 30 minutes).
- 13.6 Stop #4 conveyor and start #3 conveyor. Follow step 5.
- 13.7 Stop #3 conveyor. Start #2 conveyor, run for approximately 5 minutes. Stop cross conveyor. Allow the Fuller Kinyon pump to clear, then shut down the blower and Fuller Kinyon pump. Close the 2" valve to the PRV.
- 13.8 Take a sample. Always wear the appropriate mask, Survivair or 8710. Slowly open the sample port. Take a sample using the cutter and place an adequate amount into the sample bag. Mark the date on the bag. Close the port.
- 13.9 Start the blower, Fuller Kinyon pump, cross conveyor, #2 conveyor, and open 2" air line to PRV. Pump until empty (lever drops).
- 13.10 Repeat step 5 for #1 conveyor.
- 13.11 When #1 conveyor is empty, start rapping cycle diagonally (2 only). When pump lever drops, start opposite rappers diagonally. Allow lever to drop. Stop #1 conveyor.
- 13.12 Repeat step 11 for conveyors #2, #3, and #4 respectively.
- 13.13 When all hoppers are empty, stop the cross conveyor, Fuller Kinyon pump, and rotary blower. Close the 2" air valve feeding the PRV.
- 13.14 Check oil level in blower and add oil to reservoir if required.
- 13.15 Record the start and stop times, any mechanical or electrical problems, etc., on the Cottrell report sheet, on the shifts which the Baghouse is being pumped.

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14.0 Procedures For Wearing Self-Contained Head Gear

- 14.1 Make sure hoses are connected to the air purifying system.
- 14.2 When using an extension hose (over to the roaster) be sure the extension is clean. Do not use any hose that has been used anywhere else but on the air purifying system.
- 14.3 Connect clean head gear to air system. Use helmets that come with head gear. Align the faster kwik connectors to remove.
- 14.4 To turn on the air purifying system, turn on the air first and then the power switch. Check air pressure on gauge. The pressure should be between 60 - 80 psi.
- 14.5 Do not use any more than three head gear at the same time. There will not be enough air pressure to do so.
- 14.6 Put in ear plugs. Adjust helmet to size. Use dust respirator for secondary protection.
- 14.7 Ensure the hoses are straight and out of travel ways to prevent blockage or damage and tripping hazards.
- 14.8 Put on head gear. Use a belt over good coveralls and air hose. This helps to stabilize the head gear and prevents head gear from being jerked off. Have strings tied securely around hood. Secure wrists and ankles on coveralls.
- 14.9 Clean head gear and helmet after each shift or more often if necessary. If the shield is marked up badly, replace it. If there are holes in the head gear, patch or replace it. Store in proper place.
- 14.10 If you have any questions, ask your Shift Supervisor.

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15.0 Arsenic Trioxide Leaks and Spill Procedures

Arsenic Trioxide Leaks

15.1 Personnel required to handle arsenic trioxide shall be trained in the proper actions to be taken in the event of a leak or spill. They shall be instructed to use the proper equipment in the event of an emergency. Cottrell Operators are trained to clean up leaks and spills.

15.2 If a leak occurs personnel shall:

- see that personnel not required to deal with the problem are kept clear of the area
- put on suitable personal protective equipment
- tape the leak
- shovel up the product, putting it into a plastic bag and placing it inside the trailer
- remove protective equipment and put it into a plastic bag and place it in the trailer
- wash thoroughly with soap and water
- the manager or his designate is responsible for reporting the spill

Arsenic Trioxide Spills

15.3 See that personnel not required to deal with the emergency are kept well clear of the contaminated area and up wind.

15.4 Contact the nearest emergency departments, informing them of the problem as outlined in the Emergency Spill Action Plan report sheet.

15.5 Prevent the arsenic trioxide from contaminating waterways.

15.6 Large spills should be covered and contained until proper clean up equipment arrives, by building earthen dykes around the spill and covering with a plastic tarp. Do not leave the area unattended until clean up is completed. Do not use water to flush the product.

Fire

15.7 Keep containers cool by spraying with water. Efforts should be made to contain the water runoff. Toxic gas is emitted over 200° C. Remain up wind and wear self-contained breathing apparatus.

Environmental Concerns

- 15.8 Even small amounts of arsenic trioxide spilled as a result of a leak must be dealt with immediately, to prevent soil and water contamination. Clean up must be completed by removal of any contaminated soil and the area restored to its original state. The Manager or his designate is responsible for reporting spills.

Emergency Action

- 15.9 Should an incident arise where there is spillage, the primary efforts must be placed on containment and preventing casual observers and emergency personnel from walking through the contaminated area, or coming into contact with the dust.

It may be necessary to arrange for a backhoe to get out to the scene so that dirt can be mounded around the spill and then covered with a plastic tarp until clean up procedures are initiated.

Personnel will wear respirators, tight fitting goggles, gloves, protective coveralls, and boots.

- 15.10 The spill will have to be evaluated on an individual basis, however, most dry bulk accidents do not involve catastrophic ruptures of the tank. Small amounts of spillage should be collected in a simple way, that is, by vacuum cleaner, or carefully shovelled into open top drums or plastic bags. This material may be placed back into the trailer for processing.

A catastrophic spill may also require the use of a large vacuum truck to transfer the arsenic trioxide into a sift-proof trailer with final clean up conducted either by shovelling dirt into approved containers or possibly through the use of a front end loader into sift-proof trucks for transportation to an approved disposal site.

DO NOT use water to flush the site. This action may result in contamination of waterways or municipal water systems