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**SITE SPECIFIC HAZARD ASSESSMENT FOR
BORINGS 2028 AND 2033 LOCATED IN THE K-65
CONTROL AREA MARCH 27, 1990**

**ASI/DOE/
40
REPORT**

SITE SPECIFIC HAZARD ASSESSMENT

For

BORINGS 2028 AND 2033 LOCATED

IN THE K-65 CONTROL AREA

March 27, 1990

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1.0 INTRODUCTION

This site specific safety plan contains information that is unique to borings 2028 and 2033. Considerations unique to this location are presented in the body of the text; those that apply to the entire facility are included as appendices.

2.0 K-65 BACKGROUND INFORMATION

Contents of the Silo

The K-65 silos contain waste from the Manhattan Project, the World War II program that produced the first atomic bombs. For this work, a uranium-rich ore called pitchblende was imported from the Belgian Congo. Pitchblende was treated with nitric acid to dissolve the uranium away from the ore. The remaining residues were mixed with water and pumped into the silos, where the solids settled. The liquids at the surface were pumped back out of the silos into a treatment facility. What remains in the silos now is about 9,700 tons of residual solids.

The residues in the silos emit radiation. The radioactivity levels of the residues are higher than ordinary tailings from uranium mining and milling. Like other uranium ore tailings, these residues produce radon gas, although in considerably larger quantities.

Boring 2033 is located approximately 100 feet due east of K-65 silos 1 and 2. Boring 2028 is located in the northwest corner of the waste pit area. Boring 2028 is located near well 128 and in an area where fly ash and lime sludge was buried.

3.0 TASKS TO BE PERFORMED

A drill rig will be used to make 2 borings. Soil cuttings will be monitored and soil sampling conducted during this operation. Following drilling, casings will be placed in the holes. These borings will be conducted as time permits during calendar year 1990.

Will Site Activities:

<u>yes</u> Disturb Surface Soil	<u>no</u> Sample Surface Water
<u>yes</u> Disturb Subsurface Soil	<u>no</u> Sample Lagoons
<u>yes</u> Use Heavy Equipment	<u>no</u> Use Boat
<u>no</u> Enter Confined Space	<u>yes</u> Involve Radioactivity
<u>no</u> Disturb Containerized Matter	<u>no</u> Involve Trenches

4.0 TASK SPECIFIC HAZARD ANALYSIS

The following hazard assessment is based on historical information and previous sample results in the area. Boring logs for holes 128 (near 2028) and 133 (near 2033) were reviewed and neither showed detectable volatile organics or radioactivity above the established action limits. The field team routinely reassesses the hazards before starting work to insure that conditions have not changed. All newly identified hazards will be addressed with the ASI health and safety department to determine the degree of hazard and if any changes to the safety plan are needed.

4.1 Physical Hazards

- Radiological Hazards
 - External
 - Internal
- Drill Rig Operation
- Noise
- Heat Stress
- Overhead Hazards
- Underground Utilities

RADIOLOGICAL ASSESSMENT

(On-Site Measurements (contamination readings for boring surface and exposure rate readings at 3 foot height):

Boring 2028

Alpha	0-10 cpm	<110 dpm/100 cm ²
Beta Gamma	50 cpm (Bkgd)	<1.25 E3 dpm/100 cm ²
Exposure Rate	0.04 mR/hr	

Boring 2033

Alpha	0-10 cpm	<110 dpm/100 cm ²
Beta Gamma	<1500 cpm (Bkgd)	<3.75 E4 dpm/100 cm ²
Exposure Rate	2.0 mR/hr	

Long Lived Activity Concentrations: Not done, low activity, open environment

Radon Daughter Working Level: Not done, low activity, open environment

Thoron Daughter Working Level: Not done, low activity, open environment

4.2 Chemical Hazards

<u>Contaminant</u>	<u>PEL</u>	<u>Action Limit</u>
Thorium-232	5 E-13uCi/ml (DAC)	3 E-13uCi/ml
Ra-226	3 E-10uCi/ml (DAC)	2 E-10uCi/ml
Uranium-238	2 E-11uCi/ml (DAC)	1.E-11uCi/ml
Organics (Unknown)	Default Values	See Monitoring
Lime sludge	15 mg/M3 (total)	7.5 mg/M3
	5 mg/M3 (resp.)	2.5 mg/M3
Methanol (For eqpt. decontamination)	200 ppm	100 ppm

4.3 Routes of Entry

All of the potentially significant site contaminants are particulate in nature. The primary routes of entry are inhalation and ingestion. Direct contact may result in exposure if the uranium compounds are water soluble. No soluble uranium compounds are expected outside of the production area, but the soils/water will be handled as if soluble compounds could be present. Methanol will be used to decontaminate split spoons. This will be done in an open tub for short periods with little or no skin contact.

5.0 MONITORING AND ACTION LIMITS

Air monitoring will be performed to insure that contaminant concentrations in the breathing zone do not exceed the concentrations specified by established exposure levels. The action levels include an additional safety factor of two to account for potential inaccuracies associated with the use of field measurements. If identities of airborne organic concentrations are unknown, default values will be used.

ASI policy requires engineering controls or the use of PPE to limit onsite exposures to the action limits values. It is advisable to keep exposures to chemicals as low as possible since there is insufficient data to predict the combined effects of most chemical mixtures.

5.1 Action Limits

Instrument	Need	Interval	Limit	Action
Alpha Probe	Y	Pre-Job & Intermittent ³	500 cpm ¹	APR ²
Beta/Gamma Probe	Y	Pre-Job & Intermittent	5000 cpm ¹	APR
HNU Meter (Breathing Zone ⁴)	Y	Intermittent	Detection to 10 ppm ⁵ 10-25 ppm >25 ppm	APR SAR ⁶ Withdraw
Radiation (split- spoon sample ⁷)	Y	Continuous		
Radon Monitor ⁸	Y	Intermittant	>30 pCi/L	APR
TLD Badge	Y	Continuous		
Airborne Radiation (Breathing zone Sampler)	Y	Continuous	1E-11 uCi/ml (U-238)	

Detection is defined by ASI/IT as an HNU reading of 1ppm above the background reading. The reading must persist for one minute or more. For HNU monitoring around drilling operations the breathing zone is defined as two to three feet above the hole.

¹ Above background.

² Full-face air purifying respirators with organic vapor, acid gas, fume cartridges. Disposable protective clothing, such as saranax coveralls and a step-off decontamination will also be required at any time APR are used.

³ At intervals of 30 minutes or less at the split spoon and in the breathing zone.

⁴ Two to three feet from borehole for drilling, <14" in front of employee's shoulder for other operations.

⁵ 1 ppm above background.

⁶ Supplied Air Respirator.

⁷ Split spoon samples/tailings monitored for alpha contamination and beta/gamma contamination using hand-held alpha scintillator and Geiger Mueller detectors respectively.

⁸ For location 2033 only

6.0

TASK SPECIFIC PERSONAL PROTECTIVE EQUIPMENT

All employees at the Fernald site will wear at least Level D protection. All employees in the task exclusion area will wear the following personal protective equipment.

<u>ITEM</u>	<u>PPE NEED</u>	<u>JUSTIFICATION</u>
APR	N	Required if action levels are exceeded.
Cartridges - Combination OV,AG, HEPA	N	
Hearing Protection	Y	For Drilling
Hard Hat	Y	Minimum Requirement
Latex Boots	Y	Potential Contamination
Gloves	Y	
Inner Gloves	N	
Leather-Palm Gloves	Y	For drilling
Nitrile Gloves	Y	For methanol decontamination of eqpt.
Process Coveralls	Y	
Plain Tyvek	Y	Possible Radioactive Contamination
PE Tyvek	N	
Process Coverall	N	
PVC Gloves	N	
SAR	N	
Safety Glasses	Y	Minimum Requirement
Safety Goggles	N	Optional
Safety Shoes	Y	Minimum Requirement
Saranex Tyvek	N	
Site Specific Safety Plan Well Borings 2028 and 2033 April 23, 1990		

7.0 SITE ACCESS

7.1 Access

Access to the Feed Materials Production Facility is limited by Westinghouse Security. All site personnel and visitors must register and be issued a pass to enter the DOE property.

7.2 Bioassay Samples

A sample of urine is required to be submitted for assay prior to each work period and at the end of the ten day work period.

7.3 Medical Monitoring

In accordance with 29 CFR 1910.120 OSHA requirements, all ASI and subcontractor field personnel are required to participate in a medical monitoring program which includes:

- A baseline medical examination
- Annual medical examination
- Medical examinations may be required after potential exposures.
- Exit medical examination
- WMCO respirator physical

7.4 Training Requirements

All ASI and ASI subcontractor personnel assigned to the site tasks will, as a minimum, meet OSHA training requirements including:

- 40-hour OSHA training
- 8-hour annual refresher training
- 8-hour supervisory training (for supervisors)
- 24-hour supervised field experience
- Review of site specific hazards and procedures (tailgate safety meetings)
- WMCO radiation safety training
- WMCO respiratory training and fit test

7.5 Contamination Zones

The Exclusion Zone is the zone of high potential hazard due to physical or chemical dangers. Access to the Exclusion Zone is restricted to employees who are required to enter in order to perform their job functions.

7.0 SITE ACCESS (continued)**7.5 Contamination Zones (continued)**

A minimum radius of four feet from the rotating auger will be considered to be the Exclusion Zone. The zone may be expanded if airborne hazards are detected. The Exclusion Zone will be marked with cones or other easily recognizable devices. All areas requiring the use of respiratory protection are included in the exclusion zone.

Experience at FMPC has shown that the areas away from the production facility generally contains very low levels of uranium and does not warrant a formal contamination reduction zone. No formal zone for contamination reduction will be required unless contamination is detected above the action limits.

8.0 SITE ENTRY PROCEDURES

- X Each site crew will radio CONTROL daily to establish; radio contact, location, start time and stop time.
- X Procure radiation work permit from WMCO for drill rig operations.
 - Identifies degree of radiological hazard.
 - May limit allowable work time.
 - May specify minimum PPE requirements.
- X Procure penetration permit from WMCO for drill rig operations.
 - Identifies potential underground hazards such as utilities and buried tanks.
- X Procure utilities clearance from WMCO subcontractor.
- X All heavy equipment is required to undergo a safety inspection by WMCO Fire and Safety personnel upon initial entry to the FMPC.
- X Perform tailgate meeting to familiarize team with site specific hazards. Identify exclusion zone and break area. Discuss alternate communications signals (if applicable).
- X Calibrate instruments and log calibrations.
- X Visually scan the site for signs of contamination.
- X Perform respirator check out and fit test prior to use.
- X Monitor for volatile organics using real time instruments such as an HNU.
- X Monitor for radiation using radiation meters for alpha and beta/gamma.
- X Use buddy system.
 - Teams of at least two individuals will be used for all activities within an exclusion zone. Team members will monitor each other for signs of heat stroke or other distress and will render aid.

Note: The ASI Site Safety Officer and any member of the ASI field team have the authority to stop work when imminent or serious safety hazards or conditions exist. Restart of work will be allowed only after the hazard or condition has been abated or reduced to a level deemed acceptable by the SSO (or his designated representative) and Project Manager. If there is a question about what is acceptable, the work should be discontinued and the matter discussed with the Director of Health and Safety, Waste Management Division: William Kwoka, (615) 483-1274 - Work; (615) 482-2885 - Home. In Mr. Kwoka's absence, please call the Director of Health and Safety, Corporate Office: Greg McAnarney, (505) 889-3038 - Work; (505) 293-0794 - Home.

9.0 SITE EXITING PROCEDURE

9.1 Contamination Detection

All site personnel are required to decontaminate themselves and then confirm the effectiveness of the decontamination. The effectiveness will be determined by frisking with a hand held radiation monitor.

The monitor must be held within 1/2 inch of the surface to measure radiation. If frisking count exceeds DETECTABLE, additional decontamination is required. This field decontamination will be conducted by scrubbing with soap and water. Frisk at 1" per second over the surface being monitored.

In the event that contamination can not be removed to below the action level (100 cpm beta/gamma or detectable alpha above background), notify JOSEPH POLIZIANI.

Vehicles and other equipment used onsite must be monitored for contamination (and decontaminated if necessary) before moving them to non-contaminated areas. WMCO personnel will determine when the equipment is safe to move to clean areas.

9.2 Decontamination

Decontamination reduces contaminant concentrations to acceptable levels, but does not generally remove it totally. Try to avoid contamination where possible by making minimum contact with the contaminant.

Personnel: Dry removal of disposable protective equipment, wash hands, face and any other exposed skin. Detergent and water should be used to scrub skin surfaces which have contacted potentially contaminated wastes.

The effectiveness of decontamination must be confirmed by frisking or the use of hand and foot monitors.

Monitoring Equipment: Any exposed areas of the monitoring equipment surface will be wiped with a damp paper towel/cloth to remove contamination. Wiping with cloth dampened with detergent solution may be necessary to remove greasy materials

Heavy Equipment: Heavy equipment generally requires decontamination at the equipment pad for non-production area environmental work. Frisking and/or wipe tests will be performed to confirm the effectiveness of decontamination.

10.0 INVESTIGATION DERIVED WASTES

Investigation derived wastes are wastes generated in the performance of onsite activities. These wastes include, but are not limited to:

- Auger cuttings
- Disposable PPE such as Tyvek coveralls, gloves booties.
- Excess sample materials such as soil or water.
- Decontamination solutions such as methanol.

All potentially contaminated waste materials resulting from ASI site activities will be collected and placed in drums or other containers specified by the client. Protective clothing will be placed in plastic bags and disposed of as compactible, potentially contaminated waste through WMCO. Wastes will be segregated, specifically waste solvent such as methanol will not be combined with other wastes such as disposable protective clothing.

Investigation derived wastes are the property of the client and are to be left onsite unless otherwise specified in the written contract.

The client will be responsible for proper transport, shipment or disposal unless otherwise specified in the written contract.

11.0 CONTINGENCY PLANS

WMCO Has an established Emergency Response Plan and this organization will be utilized for any emergency other than minor injuries. ASI personnel will not attempt to treat injuries, fight significant fires or control chemical spills.

Injuries

In the event of injuries, site personnel will try to reduce or eliminate the consequences when possible. The process of determining what is appropriate to do requires that each situation be evaluated on a case by case basis. Workers are not to enter an unknown atmosphere in a confined space without proper respiratory equipment even if a person has collapsed.

If it is safe for the worker to attempt rescue, it should be done without delay to minimize the victim's injuries.

11.1 Minor Injuries

Minor injuries (sprains, strains, and cuts) are expected to be controlled by onsite personnel using standard first aid practices. ALL INJURIES WILL BE TREATED BY WMCO MEDICAL AND REPORTED TO ASI PROJECT HEALTH AND SAFETY (JOE POLIZIANI).

11.2 Serious Injuries Radio CONTROL

The WMCO Medical Department maintains an emergency life squad crew and ambulance on all shifts, seven days a week. This crew will be notified immediately of any serious injury. The ASI crew will use standard first aid procedures to stabilize the injury pending arrival of WMCO response personnel.

CPR should be administered only by persons currently certified in CPR. Prior to performing CPR, the rescuer should consider what caused the victim to collapse. Chemicals around the nose and mouth can endanger the rescuer.

11.3 Injuries Complicated by Contamination Radio CONTROL

All injuries within the process area will be assumed to involve contamination until proven otherwise by WMCO. Injuries complicated by chemical contamination will be evaluated after considering the hazards associated with the contamination. In most instances, the site contamination is of concern only if long term exposures occur. In these instances, the injury will be given the highest priority and contamination reduced as soon as practical.

11.0 CONTINGENCY PLANS (CONTINUED)

11.3 Injuries Complicated by Contamination (continued)

Injuries of persons contaminated with acutely toxic chemicals will be treated so as to minimize the hazard to both the rescuer and the victim. If the rescuer can not safely attempt rescue, he/she should not attempt it.

- The victim should be moved into an uncontaminated area and given a preliminary decontamination.
- Preliminary decontamination generally consists of flushing with water to dilute and remove most of the chemical. It also includes removal of contaminated clothing.
- As soon as the chemical hazard has been reduced to an acceptable level, the rescuer should stabilize the victim.
- More thorough decontamination can be performed at a later time.
- Care should be taken to minimize the spread of contaminant through run off.
- Notify the ambulance dispatcher of the chemical involvement.
- Extent of injuries.
- What treatment has been performed (including decontamination)
- Number of victims.
- Your location.
- Telephone number.
- You HANG UP LAST. The dispatcher is trained to be calm and ask for the appropriate information in the order that it appears on his/her form. In some instances, the facility may be complex and require additional information such as cross streets or an escort from the entrance to the site.
- If you call the hospital, notify the emergency room of the chemical involvement so that they can prepare for the arrival.

11.4 Fire Hazards Radio CONTROL

Fire hazard operations include field activities such as drilling near pipelines, using flammable decontamination solutions, etc. All uncontrolled fires will be reported to WMCO, and the fire brigade requested before attempting any fire suppression activity. Emergency requests will be made by radio to CONTROL.

Small fires which appear to be controllable by field personnel should be controlled only if the safety of the field personnel is not jeopardized. Resources such as water, fire extinguishers, and soil may be used to contain or extinguish small grass or solvent fires.

11.5 Chemical/Radiological Releases Radio CONTROL

If a release in the form of a spill, leak or vapor cloud is observed, ASI personnel will withdraw at least 300 feet upwind and immediately notify authorities in the following order:

1. Radio to "CONTROL"
Control will dispatch the necessary personnel to handle the situation.

If possible, the following information should be included in the notification:

- Cause of release if known
- Location of release
- Time of release
- Chemical identify
- Quantity involved
- If there is radioactive involvement
- If materials are leaving the area as a vapor/gas
- If there is fire involvement
- The number of known exposures or injuries (if any)

Additional information may be requested such as:

- What has been/is being done to minimize the hazard.
- Degree of hazard to responders based on your knowledge of the contaminants.

11.0 CONTINGENCY PLANS (CONTINUED)

11.6 Chemical SplashesEyes

Move the victim to an uncontaminated area. Hold the victims eyes open and flush eyes for 15 minutes with water (or isotonic saline).

- Notify Control.
- Tell the Control the name of the chemicals, if known. Tell them what was done to treat the patient(s).
- Tell how many patients to expect.

Skin

Move the victim to an uncontaminated location. Remove contaminated clothing and wash the affected skin areas. Flush the skin for 15-30 minutes and notify Medical.

ROUTE TO HOSPITAL FROM SITE

First aid station and ambulance service is available onsite. Radio contract CONTROL. WMCO maintains an emergency response capability which includes an ambulance and EMT medical personnel.

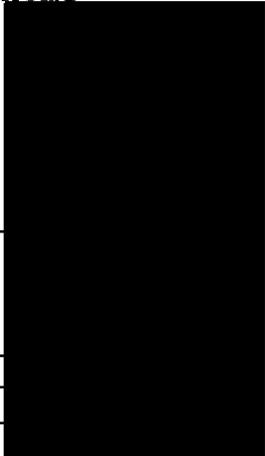
HOSPITALS

The nearest medical facility is the WMCO Medical Facility. It is the primary choice for onsite injuries. The WMCO ambulance will transport the injured to the nearest hospital if necessary.

- 1 The natural response to eye pain is to close the eyes. The rescuer must keep the eyes open to remove chemical from under the eyelids. The flushing solution can cause extreme discomfort if it is too hot or too cold. Try to maintain solution near body temperature.

11.7 Emergency Telephone Numbers

Ambulance: Radio to Control
 Hospital: Radio to Control
 Fire: Radio to Control

	Work	Home	Radio
Bill Kwoka, Dir. H&S (WMD):	(615)483-1274		
Alvin Luttrell, V.P. (WMD):	(615)483-1274		
Harry Windecker:	(513)738-3100		
Ray Meyer, Site Manager:	(513)738-3100		
Randall, Odell, SHSO:	(513)738-3100		822
Joe Poliziani, H.P., PHSO:	(513)738-3100		810
Bob Galbraith,	(513)738-3100		
Wm. Hertel, Field PM (IT):	(513)738-3100		817
Susan Birner, Personnel:	(505)883-0959		
Greg McAnarny, H&S (Corp.):	(505)883-0959		
Leo Singleton, WMCO:	(513)738-8908		
Dick Kasperek, WMCO:	(513)738-6899		
Mark Turner, H.P.:	(513)738-6899		824
Oba Vincent (DOE)	(513)738-6937		
EMERGENCY RESPONSE	(513)738-6511		or CONTROL
Industrial Hygiene:	(513)738-6207		357
Radiation Safety (WMCO):	(513)738-6889		355
Fire and Safety (WMCO):	(513)738-6235		303
Utility Engineer (WMCO):	202

12.0

CONFINED SPACE ENTRY

No Confined Space Entry is Permitted.

13.0 PERSONAL PROTECTIVE EQUIPMENT

This discussion of personal protective equipment is generic in nature. Specific site requirements are presented in the site specific section.

13.1 Level-B

Hardhat (optional)
 Face Shield (optional)
 Self contained breathing apparatus (Air line or bottled air)
 Disposable coveralls: Saranex, Tyvek or equivalent
 Inner gloves: Latex or PVC
 Outer gloves: (chemical resistant): Nitrile, butyl etc.
 Chemical resistant boots
 Latex booties (optional)
 Level-B PPE is to be worn in any of the following environments:

- Atmospheres containing chemicals having poor warning properties.
- Unknown atmospheres
- IDLH atmospheres
- Air concentrations exceeding 3X exposure standard
- Contaminants do not pose significant threat of exposure through skin absorption.

13.2 Level-C

Hardhat (optional)
 Face Shield (optional)
 Air purifying respirator cartridges (organic vapors, acid gas, pesticides, radionuclides, particulates)
 5-minute escape apparatus (optional *1)
 Disposable coveralls: Saranex, Tyvek or equivalent
 Inner gloves: Latex or PVC
 Outer chemical resistant: Nitrile, butyl etc.
 Chemical resistant boots
 Outer Disposable booties: latex
 Level-C is intended to be used where:

- Contaminants have good warning properties
- Cartridges are approved for use with the contaminant
- Oxygen concentrations are between 19.5 and 25%
- Toxic contaminant concentrations are not IDLH
- Concentrations are known and continuously monitored
- Contaminant concentrations do not exceed 3X exposure

13.0 PERSONAL PROTECTIVE EQUIPMENT (CONTINUED)

Cartridges will be changed:

- Daily.
- If color indicator shows that the cartridge is spent.
- If breakthrough is detected.

13.3 Level-D

Hardhat (optional)

Eye protection: safety glasses or goggles

Coveralls

Work boots

Work gloves

Level D PPE is basically a work uniform and provides no protection against chemicals. Level D is intended for sites where there is no risk from contaminants which can enter the breathing zone. Since most nonvolatile chemicals can adhere to particulates and be resuspended in the air, Level D is generally not permitted on contaminated sites. Level D can be used to work in areas where there is no risk of contamination such as upgradient installation of "Background" monitoring wells. Level D is not street clothes.

14.0 CALIBRATION OF SITE ENTRY EQUIPMENT

It is the designated Site Safety Officer's duty to check the log book(s) before site entry to verify that the site entry equipment was calibrated. If the following information is not present, the SSO should notify the team leader who is ultimately responsible for the overall operation. The team leader is then responsible for getting the items corrected.

14.1 HNU Photoionization Detector

Calibrate daily before entry

Record the following information for each calibration:

- Date
- Time
- Site name

Calibration gas: Concentration and identity

Span potentiometer setting

Difficulties

Calibrator's name (printed)

Probe type

14.2 Radiation Meter

Semi-annual calibration by manufacturer or NBS traceable standard.

Daily field function check using check source or gas mantle bags.

Record:

- Date
- Time
- Radiation source

Results: Note that the readings should be stable. If the results start to change while testing under the same conditions, notify the ASI Health and Safety Department.

15.0 DRILL RIG OPERATIONS

All drilling operations are dangerous. Several safety tips will make monitoring safer.

UNDERGROUND HAZARDS

No ground penetration employing heavy equipment is permitted until public/facility representatives have determined that underground utilities are not present.

Electricity

Gas

Sewer

Telephone (metallic and fiberoptical cables)

Water

Steam

Cave-in hazards may be present in Karst topography or near storage tanks

Fire and explosion hazards are also present if containerized chemicals are present underground.

(geophysical testing should be performed if there is doubt about the presence or location of underground structures.)

OVERHEAD HAZARDS

Wires

- 10 feet from a 50 KV line;
- 20 feet from a 50 KV to 345 KV line; and
- 34 feet from a 345 KV to 750 line.

Buildings (25' clearance needed to raise boom)

Tree limbs (25' clearance needed to raise boom)

MISCELLANEOUS HAZARDS

Lightening

Rain on Cathead

Weak cables, ropes or hydraulic lines

Loose fitting clothing tends to snag on the rotating auger

Volclay contains crystalline silica which can cause silicosis.

Noise

PROCEDURES

No one but the drillers should be within 4 feet of the rotating auger. Monitoring should be performed during periods of auger change or when the auger is stopped.

The drilling crew is responsible for maintaining the drill rig and stopping work if unsafe conditions develop.

15.0 DRILL RIG OPERATIONS (CONTINUED)

The designated health and safety personnel are expected to be familiar with the chemical and radiological hazards associated with the site operations, but are not experts in drill rig operations. If they notice something that appears to be a hazard, they will notify the drillers so that the drillers can assess the condition. Actions taken (including no action) will be documented. The safety personnel will also assure that:

1. The drilling crew demonstrates to the field team, that the kill switch is functional, and shows its location. No drilling is to be permitted if the kill switch is not operational or if the field crew is not familiar with its location and operation.
2. A minimum of two persons will be present at the drill rig at all times of operation.
3. Respiratory protection is worn when conditions warrant it. Personal protective equipment impairs the operator's vision. Gloves and other safety equipment can make "normal operations" more difficult to perform. Unnecessary use of respiratory equipment should not be required. If a driller feels more comfortable using respiratory protection to reduce exposures which will not exceed the published exposure levels, he must be aware of the increased physical hazards.
4. That at least five (5) feet of clearance is maintained on all sides of the drill rig for emergency egress.

NOISE

Noise can exceed the levels set by OSHA during certain operations such as driving a split spoon. Hearing protection should be worn.

15.0 DRILL RIG OPERATIONS (CONTINUED)

PERSONAL PROTECTIVE EQUIPMENT (PPE)

Personal protective equipment should include:

Hard Hat

Eye protection such as safety glasses or goggles.

Safety boots

Hearing protection

Gloves

DECONTAMINATION

Decontamination of drill rigs generally requires the use of power cleaners such as pressure sprayers or steam cleaners. Wipe tests are required to confirm the effectiveness of decontamination efforts. No contaminated heavy equipment is to leave the site without the written permission of the site operator (Westinghouse).

CHEMICAL AND RADIOLOGICAL HAZARDS

Will be dealt with in the hazard assessment section.

16.0 HEAT STRESS

Heating of the body occurs from three sources:

1. Radiant heating from heat sources or sunlight.
2. Convective heating from contact with a warmer object or fluid.
3. Metabolic heating caused by activity.

Cooling occurs through three mechanisms:

1. Respiration: The air we exhale is warm. As the body overheats, the respirations become more rapid.
2. Radiation: Heat is released at the surface of the skin. As the body overheats, the surficial blood vessels dilate and allows more heat to be lost.
3. Evaporation: Perspiration is released to the skin surface and evaporates. The skin is cooled by evaporative cooling.

Personal protective equipment reduces the body's ability to shed excess heat through radiation and evaporation. Personal protective equipment (for chemicals) can also act like a greenhouse and collect radiant heat.

These facts mean that heat stress can be a serious problem to hazardous waste site workers. The following discussion is intended to familiarize personnel with the symptoms of heat stress.

Heat stress is a progressive condition. Its mildest form is a slight elevation of body temperature. Normal body temperature is generally near 98.6 F. Working in high temperatures may elevate the temperature to 100-101 F. By the time that the body temperature reaches 101 F, the worker generally has a headache. This is not a serious condition and can be treated through increased rest periods and cool fluid intake. The worker should not be allowed to work until the body temperature has been reduced to below 99F.

If work continues when the first symptoms occur, the person may develop Heat Cramps. Heat Cramps are brought about by long exposure to heat. The outside temperature does not have to be much higher than the "normal" environment. The person perspires heavily, often drinking large quantities of water. As the sweating continues, salts are lost by the body bringing about painful muscle cramps.

Treatment: Any heat related emergency will be immediately reported to the WMC0 medical department for subsequent treatment. The worker should be given rest, cool fluids, and removed from work for at least the remainder of the day. The person is likely to have an increased susceptibility to heat for the next few days.

16.0 HEAT STRESS (CONTINUED)Heat Exhaustion

Heat exhaustion symptoms include a near normal body temperature and profuse sweating. The temperature may reach 103 F.

Treatment of Heat Exhaustion

Remove the person from field work. Have the person rest in a cool area such as an air conditioned car or shaded area. Provide cool liquids to drink. Avoid beverages which contain caffeine or alcohol. Do not allow the victim to go back to work for at least one or two days.

Heat Stroke

Heat stroke is a life threatening condition. The person's body temperature regulating mechanism fail and his body can not rid itself of excess heat. Heat stroke symptoms include high body temperatures and HOT DRY SKIN. Most cases of heat stroke are reported on hot humid days.

HEAT STROKE VICTIMS MUST BE TRANSPORTED TO A HOSPITAL FOR IMMEDIATE TREATMENT. The individual must not be allowed to drive himself, since cases are on record where the victim's condition worsens, he lapses into unconsciousness and dies. Heat stroke victims are not to return to field work without the physician's consent.

PREVENTION OF HEAT STRESS

Become acclimatized to heat for several days whenever possible. Work in the cooler portions of the day. Early morning hours and evening hours are cooler.

Take frequent breaks and consume at least one pint of cool fluid every hour. Replenish electrolytes through the consumption of diluted drinks. The body loses more water than electrolytes. Concentrated salt, electrolyte, or juices can make you more susceptible to heat stress.

Monitoring:

Heat Stress Monitoring should be performed whenever temperatures exceed 80 F and respiratory protection is required. Oral temperatures and pulse rates will be taken at the end of each break. Elevated temperatures or elevated pulse rates will be handled as follows:

Oral Temp.: less than 99:	Continue Work
Oral Temp: 99-100.3 F	Reduce rate of work or take more frequent breaks.
Consume	more cool fluids.
Oral Temp: > 100.4 F	Remove from work until temp. reduced to 99 F or less a.
Pulse Rate: > 110 bpm	Remove from work until pulse rate falls below 110 beats per minute.

If the body temperature exceeds 100.4, the pulse rate exceeds 110 bpm at rest the person must not continue to work. These conditions have been found to prevent most heat related illnesses. Occasionally, high heat conditions combined with poor eating, sleeping and drinking habits has resulted in heat stroke occurring in less than 20 minutes.

Heat stress monitoring must be performed at least once per hour for documentation, but may have to be increased under severe circumstances.

Table 3 Signs and Symptoms of Heat Stress

- **Heat rash** may result from continuous exposure to heat or humid air.
- **Heat cramps** are caused by heavy sweating with inadequate electrolyte replacement.

Signs and symptoms include:
 - muscle spasms
 - pain in the hands, feet, and abdomen
- **Heat exhaustion** occurs from increased stress on various body organs including inadequate blood circulation due to cardiovascular insufficiency or dehydration. Signs and symptoms include:
 - pale, cool, moist skin
 - heavy sweating
 - dizziness
 - nausea
 - fainting
- **Heat stroke** is the most serious form of heat stress. Temperature regulation fails and the body temperature rises to critical levels. Immediate action must be taken to cool and body before serious injury and death occur. Competent medical help must be obtained. Signs and symptoms include:
 - red, hot, usually dry skin
 - lack of/or reduced perspiration
 - dizziness and confusion
 - strong, rapid pulse
 - coma

Because the incidence of heat stress depends on a variety of factors, all workers, even those not wearing protective equipment, should be monitored.

17.0 APPROVAL AND COMPLIANCE STATEMENT

This site specific safety plan was produced for the use of ASI employees and ASI subcontractors. It was intended for the Feed Materials Production Center, Fernald, Ohio.

The undersigned persons have read and understand the attached site specific safety plan and agree to follow its provisions*1:

Name (lettered)	Signature	Date
TEAM LEADER		
DESIGNATED SITE SAFETY OFFICER		
EQUIPMENT OPERATOR		

The following individuals are not obligated, by contract, to follow ASI safety policies, but have read and understood the safety plan:

*1 Compliance with the provisions of this HASP may be audited through announced or unannounced site visits. Be sure that you are implementing the provisions of the safety plan and documenting the reasons for field actions/changes when they are necessary. Site visits may be performed:

- ___ By ASI
- ___ By Client
- ___ By OSHA

SITE SPECIFIC HAZARD ASSESSMENT

For

BORINGS 2028 AND 2033 LOCATED

IN THE K-65 CONTROL AREA

April 23, 1990

APPROVALS

W. Kwoka, ASI

J. F. Poliziani

J. Poliziani IT

DOE Representative

Date Rec'd APR 24 1990
Log D-1783
File 34
Library _____

MEMORANDUM

To: Oba Vincent
From: Joe Poliziani *JFP*
Date: 23 April 1990
Subject: Resolution of Comments for Site Specific
Safety Plans for Borings 2028 and 2033

Please find attached to this memo the responses to your comments and WMC0's comments concerning borings 2028 and 2033. Please note the location of the well borings. I suspect there may have been some confusion on the location of the wells. One well (2028) is located in the northwest corner of the waste pit control area. The other well (2033) is located several hundred feet east of the K-65 silos. A map has been included in the plan.

If you have any questions, feel free to contact me at 738-3100.

jf

90M0356.JP

Attachment

cc: Project File Task 7.3
Steve Davis, IT

COMMENTS ON SSSP FOR
BORINGS 2028 AND 2033 LOCATED IN THE K-65 CONTROL AREA

1. A site map is required to be in the site access section, please mark bore hole locations and exclusion zones.
2. This plan should not be for horizontal borings only vertical. If this is true, please change the statement at the bottom of each page that says "horiz. boring". If this is not true we need to talk.
3. What is the potential for exposure to lead during this drilling?
5. Please change the date on the bottom of this document from 12 Jan 90.
6. Urine sampling is not a good biological indicator for exposure to thorium or radium. Have you considered taking any radon breath or fecal samples during this project.
7. Will there be any ALARA actions ~~be~~ initiated for work around boring 2033.
8. For personnel working in this area have exposure limits (weekly or monthly) been established?
9. Worker contamination while working in the K-65 area should be reported to DOE or to CONTROL during off hours.
10. Add my name and phone number to the list of people to be notified after an accident/contamination problem occurs.
Oba Vincent, DOE Health and Safety Engineer, 738-6937 (work) 513-779-6210 (home)

FMPC
 ENVIRONMENT, SAFETY & HEALTH DEPARTMENT
DOCUMENT REVIEW AND RECORD FORM

ORIGINATING DEPARTMENT: **69**

DOCUMENT ORIGINATOR

COMMENTS DUE BY:

REVIEWING DEPARTMENT: (Name & Date Received)

DOCUMENT TITLE AND IDENTIFYING NUMBER:
00 SSI Hazard Assessment for Benz 2028 & 2033

ITEM NO.	REVIEWER'S NAME	DOC. PAGE OR SEC. NO.	SRC	COMMENT	REVISION DATE:	COMMENT RESOLUTION
1	DH-Elving	pg 5 & 8	<input checked="" type="checkbox"/>	<p>Safety goggles need to be used when handling methanol whenever there is a potential for splash (especially dangerous to eyes)</p> <p>you <input checked="" type="checkbox"/> consider need for skin protection for methanol use if a flammable concentration.</p>		

Checked Comments must be resolved as "SIGNIFICANT REVIEW COMMENTS".

Comment Resolutions(s) Accepted By:

REVIEWER OR REVIEWING DEPARTMENT REPRESENTATIVE
 (Signature required on SRC - comments only)

DATE

FMPC-ES&H-2827 (8/22/06)

Resolve to Comments for SSSP 2028 and 2033

Response to O. Vincent's DOE comments:

1. A site map is included in the final draft.
2. The plan is for vertical borings only. The footer will be corrected in the final draft.
3. Previous analyses of samples from similar boreholes have detected lead concentrations in the range from 20 mg/kg to several hundred mg/kg. The airborne exposure limit (PEL) for lead is 50ug/m³. Assuming a lead concentration in soil of 600mg/kg, a total dust concentration in air of 83.3 mg/m³ would be required to reach an airborne lead concentration of 5 ug/m³. This would be perceived visually as a dust cloud. Visual observation of current drilling operations indicates that very little dust is generated so the lead concentration should be well below the PEL. However, since the issue has been raised, samples will be collected and analyzed for airborne lead (NIOSH method 7082) at one of the boreholes.
4. There was no Comment 4.
5. The date will be changed to be to be current in the final draft.
6. Based on past breathing zone and general air sampling results during operations in the waste pit control area, long-lived activity concentrations have remained well below the derived air concentration (DAC) for the most conservative nuclide, namely Th-232 which has a DAC value of 5E-13 uCi/ml. Ra-226 has a DAC value of 3E-10 uCi/ml, nearly 600 times higher than Th-232. Based on ICRP-30 a worker exposed to 2000 DAC-hrs per year receives his annual limit on intake (ALI). Based on this air sampling data and the above information, the institution of a fecal or radon breath sampling program is unwarranted.

Also, WMC0 has instructed ASI to follow their bioassay and dosimetry program for work on the FMPC site. WMC0 does not perform routine fecal and/or breath analysis as part of their radiation protection program.

7. A formal ALARA review is typically not written unless exposure rates exceed 2 mR/hr. The primary reason for this action guide is that a worker in a 2 mR/hr radiation field will receive approximately 4000 mrem in a working year of 2000 hours, or 80% of the applicable limit. I am not aware of any specific guidance that recommends ALARA-reviews for total collective dose (man-rems).

Workers will be instructed to minimize their exposure time in the area by not lingering, conducting meetings, or taking breaks near the drilling site. No other ALARA methods are planned.

8. We are limited by "stay-times" derived to meet the exposure guides set by the WMC0 Radiation Work Permit of 150 mrem whole body/week and 300 mrem skin/week.
9. Agree. WMC0 and DOE will be notified of all accidents or contamination incidents.
10. O. Vincent will be added to emergency notification in the final draft.

Response to D.A. Fleming; WMC0's Comments:

1. Small spray bottles containing less than 0.5 L of methanol are used in split spoon decontamination. These bottles are filled before going on site. Very small quantities of the solution are used to decontaminate each spoon. Thus, there is no significant probability of splash entering the eyes.

Following ingestion or inhalation of a sufficient dose of methanol, the resulting metabolites, formaldehyde and formic acid, may damage the optic nerves. Methanol placed on the exterior surface of the cornea causes mild irritation and is not extremely dangerous (Patty's Industrial Hygiene and Toxicology, 3rd revised edition, Volume 26, page 453). Safety glasses are determined to be adequate for this operation.

2. The need for fire protection has been considered. Total methanol on site will be less than 1 L. The spray bottles are used in an open environment. Our conclusion is that this does not represent a significant fire hazard.