CHEMICAL HYGIENE PLAN

(Coversheet 1 of 2)

Laboratories covered under this Plan:

Kentucky Water Science Center Water-Quality Laboratory, Room 27

Laboratory Supervisor: Angela S. Crain, 502-493-1943

Laboratory Personnel: Gregory K. McCombs, 502-493-1921
Charles J. Taylor, 502-493-1931
Michael D. Unthank, 502-493-1932
Douglas D. Zettwoch, 502-493-1922

Approved By: _____
(Signature of Water-Quality Lab Supervisor)

Date: March 2008

Emergency Numbers and other Safety Contacts

Organization: USGS, WRD, Kentucky Water Science Center

Collateral Duty Environmental Program Coordinator: Douglas D. Zettwoch, 502-493-1922

Collateral Duty Safety Coordinator: Douglas D. Zettwoch, 503-493-1922

Regional Safety and Occupational Health Manager: Clyde J. Sholar, 502-493-1911

Emergency Number: Douglas D. Zettwoch [cell #], 502-693-4037

It is mandatory that all lab workers read the enclosed Chemical Hygiene Plan and sign the Training Log.

CHEMICAL HYGIENE PLAN

(Coversheet 2 of 2)

Laboratories covered under this Plan:

Kentucky Water Science Center Sediment Laboratory, Room 30

Laboratory Supervisor: Elizabeth A. Shreve, 502-493-1916

Laboratory Personnel: Aimee C. Downs, 502-493-1944
Daniel R. Allen, 502-493-1870

Approved By: _____
(Signature of Sediment Lab Supervisor)

Date: March 2008

Emergency Numbers and other Safety Contacts

Organization: USGS, WRD, Kentucky Water Science Center

Collateral Duty Environmental Program Coordinator: Douglas D. Zettwoch, 503-493-1922

Collateral Duty Safety Coordinator: Douglas D. Zettwoch, 503-493-1922

Regional Safety and Occupational Health Manager: Clyde J. Sholar, 502-493-1911

Emergency Number: Douglas D. Zettwoch [cell #], 502-693-4037

It is mandatory that all lab workers read the enclosed Chemical Hygiene Plan and sign the Training Log.

Path to electronic version of the KY WSC Chemical Hygiene Plan:
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Laboratory Operation (1):

Name of Lab: Kentucky Water Science Center Water-Quality Laboratory Room No: 27

The Kentucky Water Science Center Water-Quality Laboratory is used to prepare preservatives for surface-water and ground-water samples collected in the field as a part of our project work. Typically, samples are preserved with nitric, sulfuric, or hydrologic acids. Also, strong bases may be used, such as sodium hydroxide. Bottles and containers are rinsed with dilute acid and sealed in bagged containers as part of our special clean hands/dirty hands protocol.

Dye-trace samples are analyzed by mixing an elutant and extracting rhodamine-wt, blue dye indicators, fluoroscene, or other types of dye-trace materials. Samples are analyzed using a spectrofluorometer.

Strong acids are diluted in the fume hood using established protocol and required personal protective equipment (PPE). Hazardous materials such as stroing acids, strong bases, mercury, or other chemicals are stored in appropriate designated cabinets. Some water samples may be filtered using pump and filter systems in the lab.

Potential Hazards for the laboratory:

- Spills from strong acids and bases
- Skin burns and caustic fumes from highly concentrated chemicals
- Slip or trip on wet floor from spills
- Danger from explosion or fire from improperly mixed chemicals
- Eye injury from chemical splashes

Laboratory Operation (2):

Name of Lab: Kentucky Water Science Center Sediment Laboratory Room No: 30

The Kentucky Water Science Center Sediment Laboratory performs analyses of suspended-sediment concentrations and suspended-sediment sand-fine breaks for project personnel from 23 Science Centers of the U.S. Geological Survey (USGS). These analyses can be used to estimate silt transportation and deposition in streams, rivers, and reservoirs. The Quality-Assurance Plan for the Analysis of Fluvial Sediment by the U.S. Geological Survey Kentucky Water Science Center Sediment Laboratory [OFR 2005-120] is available online as a PDF file on the Internet at: *http://pubs.usgs.gov/of/2005/1230/*.

Potential Hazards for the laboratory:

- Skin burns from hot ovens
- Spills from acid during dilution process
- Glass breakage of beakers, jars, etc.
- Radioactive material in automatic weight balance
- Inhalation/ingestion of bacteria or substance in water samples
- Slip or trip on wet floor

CHEMICAL HYGIENE PLAN

A. Standard Operating Procedures for Handling Hazardous Chemicals

1. Protective apparel and equipment:

It is the individual's responsibility to wear the correct clothing and use the necessary safety-related apparel and equipment. The use of loose-fitting clothing or having unconfined long hair is not permitted in the laboratories. The use of open-toed shoes or sandals is also not permitted. The supervisor must complete a Job Hazard Analysis (JHA) with employees working in the laboratories (appendix A).

In all the Material Safety Data Sheets (MSDS), the section titled "Precaution to be taken in handling and storage" will indicate the appropriate safety apparel and equipment needed for each chemical. Please be sure to familiarize yourself with the MSDS for each of the chemicals you will be using. Chapters 8 and 9 of the USGS Safety and Environmental Health Handbook (445-2-H) provide guidance for selecting safety equipment. There are no specific specialized safety audible or visual alarms in the laboratory.

Safety glasses or adequate eye protection may be required. Please be aware of the safety considerations for the particular laboratory operation you perform (see USGS Safety and Environmental Health Handbook 445-2-H, chapter 26.4 (B)).

Contact lenses should not be worn when working with specific chemicals in the laboratory. The employee should be aware of the hazards of their work situation with respect to the type of contacts they wear. If contacts are worn, the employee should seek advice from his/her physician. To avoid complications in case of an accident, the supervisor and coworkers should be made aware when an individual finds the use of contacts necessary.

If noise in the workspace will be in excess of 85 decibels, hearing protection is required (see USGS Safety and Environmental Health Handbook 445-2-H, chapter 19.3 scope and 19.4 requirement).

Use the recommended gloves when handling materials that are hazardous, irritants, or biologically active.

2. Signs and labels:

Emergency telephone numbers are posted by the telephone, on the inside cover of the CHP, on the outside and inside of the entrance doors, and on the right side of the hood. Waste receptacles are labeled for glass only or for trash. A combined safety shower and eyewash station is located in the far left corner of the water-quality laboratory.

The containers of reagents, solutions, and preparations must be clearly and properly labeled. Containers used to store other than the intended material must be cleaned, its label removed or obscured, and relabeled identifying its current use. Containers must never be cross-used with incompatible materials (see USGS Safety and Environmental Health Handbook 445-2-H, chapter 21.4).

3. Spills and accidents:

Spills are to be contained with absorbent materials compatible with the chemical as specified in the appropriate MSDS. Spills within the hood and exhaust failures are discussed in Section C.3 of this plan. Accidents are to be reported to the employee's supervisor, properly recorded in the Safety Management Information System (SMIS), and reported to the regional WRD safety manager within 5 working days. In the event of an accident during the week, notify the proper civil authority, immediate supervisor, laboratory supervisor, and management. If permission has been obtained to work in the laboratory outside normal working hours and an accident occurs, notify the proper civil authority, and as soon as possible contact the

immediate supervisor, the Collateral Duty Environmental Program Coordinator, the Collateral Duty Safety Coordinator, and management.

4. Emergency procedures:

Conduct annual fire drills and other emergency evacuations.

See Kentucky District Emergency Procedures Handbook (appendix B) for the safety and evacuation procedures to be followed in the event of a fire, tornado, or earthquake.

5. Laboratory storage:

There is limited space for the storage of chemicals in the laboratories. The storage areas for flammables and other chemicals are located in the laboratories, warehouse, and in the enclosed parking area. Storage instructions and compatibility of chemicals are explained in the MSDS's and in Chapter 8.1 in 445-2-H.

6. Waste disposal:

For the disposal of waste and the use of sanitary sewer systems for disposal please contact Douglas D. Zettwoch. For direct information on the use of the sanitary sewer systems contact the Louisville/Jefferson County Metropolitan Sewer District (540-6000).

7. Working alone:

No one is allowed to work alone when using extremely toxic or highly flammable chemicals, such as Class 1A flammables or Hydrofluoric Acid.

Working alone in the laboratory is allowed if the person has approval from the immediate supervisor and management is informed.

8. Unattended operations:

Laboratory activities requiring water and (or) power will cease when any utility is disrupted. An evaluation of the utility disruption will be performed by the immediate supervisor over the activity and the Collateral Duty Environmental Program Coordinator to determine specific action. In the event of an emergency, a list of responsible personnel is found on the inside cover of the CHP, on the outside and inside of the entrance doors, on the right side of the hood, and by the telephone.

9. General rules or procedures:

No horseplay, suctioning by mouth, or eating, drinking, or smoking will be permitted in the laboratory. Report all unsafe practices or conditions to the responsible supervisor or other authority.

B. Criteria to be used for Implementation of Measures to Reduce Exposures

1. Procurement and distribution: Before an extremely hazardous substance (e.g., high acute or chronic toxicity, class 1A flammable liquid, highly reactive chemical) is ordered, the supervisor will inform those who will be using the material on proper handling, storage, and disposal. Request a Material Safety Data Sheet (MSDS) each time a different chemical is ordered. MSDS's also are available on the USGS Intranet Safety Home Page. Accept no container without an identifying label. If not in their original shipping containers, chemicals will be transported using a container such as a rubber acid bucket or other suitable device.

All requests for chemical orders will be routed through the Collateral Duty Environmental Program Coordinator. The Collateral Duty Environmental Program Coordinator will check the chemical inventory to ensure that the chemical is not already in stock. In addition he will ensure that proper personal protection equipment and laboratory safety devices are available for any chemical(s) ordered. The quantity of chemicals

ordered should be limited to the amount expected to be used in order to avoid waste disposal/storage problems.

2. Environmental monitoring: Conduct environmental monitoring when there is any mechanical failure of the exhaust hood(s) or after any uncontrolled release of a hazardous chemical. The 24-hour telephone contact number for environmental monitoring through the U.S. Environmental Protection Agency is 1-800-424-8802. They in turn will contact the local agency responsible for chemical spills.

3. Chemical inventories: **The Collateral Duty Environmental Program Coordinator will conduct an annual inventory of laboratory chemicals.** A copy of the inventory will be kept in the laboratory, and electronic copies distributed to the Collateral Duty Environmental Program Coordinator and the Regional Safety and Occupational Health Manager. The inventory will follow the format provided by the Regional Safety and Occupational Health Manager. The inventory will include the chemical name, quantity, custodian, and location. The monitoring of chemical expiration dates and the proper disposal of expired chemicals is the responsibility of Collateral Duty Environmental Program Coordinator. When chemicals are disposed of, ensure the inventory reflects the change appropriately.

C. Fume Hood Performance

1. Use of laboratory hoods: The 48-inch basic hood in the **water-quality laboratory** is rated at 100 linear feet per minute (720-735 cubic feet per minute) airflow. It has a two-piece baffle that permits airflow adjustments for a variety of applications. The exhaust is 10 inches in diameter and externally vented by a 6-foot long, 12-inch diameter, 24-gauge galvanized steel pipe. The hood features a vertical-rising tempered safety-glass sash, an explosion-proof blower and light, and automatic by-pass system assuring containment and efficient removal of fumes caused by face-velocity fluctuations as the sash is lowered.

The 28-inch basic hood in the **sediment laboratory** is rated at 340 cubic feet per minute of airflow (100 linear feet per minute (LFM)). The exhaust is 6.7 inches in diameter and externally vented by a 7-inch diameter, galvanized steel pipe. The hood features a vertical-rising tempered safety-glass sash.

Proper hood function requires that the airflow is not obstructed by blocking the bottom of the baffle. The hood should not be used as a storage area. All equipment used within the hood shall be secured in some form in order to prevent it from being drawn into the exhaust system.

2. Recommended hood face velocity: Determine hood face velocities no less than once per year. Average facevelocities should be between 60 and 100 LFM; however, velocities up to 150 LFM are acceptable. Averages are determined by measuring the flow at the face, using no less than 3 uniform quadrants. Record on the hood the average LFM, date, maximum and minimum glass-sash height, and the initials of the person making the determination.

Hoods with average face velocities of less than 60 LFM will not be used for any toxic chemical. If hood average face velocities exceed 150 LFM, then smoke tubes or equivalent smoke generators will be used to determine if air turbulence exists within the hood. Unacceptable hood performance is when the smoke is thrown back into the breathing zone of the user. When unacceptable turbulence is noted, identify the reason for the turbulence and take steps to improve the hood's performance. If the hoods performance cannot be improved it may be necessary to halt activities requiring its use until it is repaired or replaced.
3. Spills within the hood: If there is an exhaust failure during normal working hours, stop operations and notify the immediate supervisor and the Collateral Duty Environmental Program Coordinator. If a chemical spill occurs within the hood, contain the material with absorbent materials compatible with the chemical as specified in the appropriate MSDS. If the hood exhaust fails during the spill, evacuate all those within the laboratory not essential to the containment and have one person contact the appropriate authority, the immediate supervisor, and the Collateral Duty Environmental Program Coordinator. All contact persons are noted on the right side of the hood.

4. Special ventilation areas: There are no special ventilation areas in either laboratory.

D. Employee Information and Training

1. Chemical Hygiene Plan: It is required that all lab personnel read (appendix C), discuss with the lab supervisor, practice safety procedures listed within the CHP, and sign the training log within the CHP, signifying that they have read and understand the procedures and rules. All lab personnel must understand what to do in the event of an emergency, and where within the CHP to find hazard and (or) chemical information, including MSDS information.

The CHP will be kept in the laboratory in the wall-mounted box above the telephone. All laboratory workers will be given training on this CHP prior to being allowed to perform activities in the laboratory. Laboratory workers will sign and date the back page of the CHP, stating that they have read and understand the plan.

2. Frequency of training: Conduct CHP training on a regular basis, integrating the training into the overall safety program. Employees using hazardous laboratory equipment or extremely hazardous chemicals will receive specialized training. Present laboratory activities do not require special safety training.

A. It is recommended that all persons working in this laboratory take a Laboratory Safety Course.

E. Requirements for Prior Approval of Laboratory Activities

The following water-quality- and sediment-laboratory activities have been approved.

- Acid-rinse of containers/glassware
- Analysis of samples for volatile organic compounds using a portable gas chromatograph
- Analysis of water samples, chemical elutriants, and passive detectors for fluorescent dyes used in water-tracing studies
- Preparation of 5 percent Hydrochloric acid (HCl) solution used in water-quality studies

Before an activity is approved, an evaluation of the safety implications and laboratory capabilities is required (appendix D). Participating in the evaluation will be the immediate supervisor, the Collateral Duty Environmental Program Coordinator, and management. Some examples of concern when making an evaluation for approval are:

- Especially dangerous materials known or suspected to be carcinogenic (appendix E), mutagenic, or teratogenic
- Flammable chemicals, irritants, or corrosives (appendix F)

F. Medical Consultation and Surveillance: The laboratory activities previously described may not require immunization. Immunization must be offered if laboratory personnel are to be required to handle samples from known polluted sources such as raw water, landfill leachates, and known sources of biological active contamination.

Seek medical consultation when an employee is exposed to a hazardous chemical due to failure of a laboratory hood or personal protective equipment, spill or other release, or environmental monitoring has determined the presence of an airborne contaminant above the recommended permissible exposure limit.

When medical consultation is required, provide the physician with specific information on the identity of the chemical, conditions under which the exposure occurred, and a description of the signs and symptoms of exposure. Ask the attending physician to provide a written opinion for recommended follow-up examination and test results; any detected medical conditions of the employee that place the employee at increased risk; and a statement that the employee was informed of the results.

A medical surveillance program will be established for an employee when any employee is exposed to any chemical regulated by the Occupational Safety and Health Administration (appendix G) and the employee's exposure was deemed to be above the chemical's permissible exposure limit. Laboratory workers are responsible for making the lab supervisor and others in authority aware of a changing health/medical condition, which would make it necessary to reevaluate the laboratory Job Hazard for them. EXAMPLE- pregnancy. For voluntary medical surveillance programs available to employees, contact the CDEPC.

G. Special Precautions for Work with Particularly Hazardous Substances

None of the chemicals used in the permitted activities will be at concentrations where special procedures are needed. Specific procedures will be required when working with concentrations of chemicals that meet the following: (1) the chemical is an allergen or embryotoxin (e.g., organomercurials, lead compounds, formamide); (2) the chemical has a moderate chronic or a high acute toxicity (e.g., hydrofluoric acid, hydrogen cyanide); or (3) the chemical has a high chronic toxicity (e.g., select carcinogens - see appendix E). The supervisor must complete a job hazard analysis for those working with select carcinogens to be filed with the Collateral Duty Environmental Program Coordinator. Any of those particularly hazardous chemicals must be used in designated areas that are clearly marked. Complete a written job-hazard analysis and standard operating procedures for each operation that uses any of those substances. Describe decontamination procedures in the event of a spill or other release, as well as the safe removal of the contaminated waste (for radiation, see appendix H). Definitions of terms are shown in appendix I.

Follow the job hazards analyses and operating procedures outlined in the appendixes.

TRAINING LOG

I, the undersigned, have read or reviewed the General Laboratory rules for the **Kentucky District Water-Quality Laboratory, Room 27,** the Emergency Plan, and read and understand the Job Hazard Analysis and procedure description for the task I am to perform. I realize it is my responsibility to:

1. Follow and obey the rules, which are part of the regular operation.
2. Handle equipment properly, follow all safety recommendations, and use the equipment for the task intended.
3. Use and maintain all the required personal protective equipment prescribed for the task.
4. Report accidents and injuries, no matter how minor, to the lab supervisor and to obtain first aid and (or) medical treatment.
5. Perform my job in the correct manner to reduce loss incidents to others, lab, the equipment, and myself.
6. Report all unsafe or hazardous conditions to the lab supervisor as soon as possible.

Print Name	**Signature**	**Date**	**HAZCOM** *(or other training)*	**Date**

TRAINING LOG

I, the undersigned, have read or reviewed the General Laboratory rules for the **Kentucky District Sediment Laboratory, Room 30,** the Emergency Plan, and read and understand the Job Hazard Analysis and procedure description for the task I am to perform. I realize it is my responsibility to:

1. Follow and obey the rules, which are part of the regular operation.
2. Handle equipment properly, follow all safety recommendations, and use the equipment for the task intended.
3. Use and maintain all the required personal protective equipment prescribed for the task.
4. Report accidents and injuries, no matter how minor, to the lab supervisor and to obtain first aid and (or) medical treatment.
5. Perform my job in the correct manner to reduce loss incidents to others, lab, the equipment, and myself.
6. Report all unsafe or hazardous conditions to the lab supervisor as soon as possible.

Print Name	**Signature**	**Date**	**HAZCOM** *(or other training)*	**Date**

APPENDIX A

JOB HAZARD ANALYSIS	JOB ACTIVITY: Methanol use	
BASIC JOB STEPS	**HAZARDS**	**SAFE JOB PROCEDURE**
Carrying methanol from flammable-liquids cabinet to work area	Dropping or bumping the glass container causing it to break	Use a rubber bottle carrier to transport methanol
Pouring or using methanol	Fire Hazard – Static electrical discharge may ignite vapors	Use a grounding strap to discharge static energy
	Fire Hazard – other ignition sources	Work in an area away from all possible ignition sources. Work in an explosion proof exhaust hood. Know where the fire extinguishers are located. Have a planned escape route; always work with your back to an exit.
	Breathing vapors	Work inside a hood or a well-ventilated area. Do not breath vapors.
	Skin contact	Wear appropriate personal protective equipment.
	Eye contact	Wear safety goggles.
	Cuts from broken glass	Do not pick up the broken pieces of glass with your hands. Use a broom to sweep up broken glass.
	Spill	Insure you have the proper equipment to contain and clean up a spill.
Storing methanol	Improper storage	Store methanol in a flammable liquids cabinet.
	Fire hazard	When using methanol, keep it in a stainless-steel safety can and not in the glass container.
	Hazardous vapors	Flammable-liquids cabinet should be vented.
Carrying methanol from work area to flammable liquids cabinet	Dropping or bumping the glass container causing it to break	Use a rubber bottle carrier to transport methanol.

APPENDIX B

U.S. GEOLOGICAL SURVEY
Kentucky Water Science Center
9818 Bluegrass Parkway
Louisville, Kentucky 40299 –1906

EMERGENCY PROCEDURES

FIRE ‡ POLICE ‡ AMBULANCE	⇨	9-911
FBI	⇨	(502) 583-3941
Doug Zettwoch, Safety Officer	⇨	(502) 493-1922
		(502) 693-4037 [cell]

NOTE: Emergency Procedures should be read by each employee. A copy is posted on the KY WSC Intranet for easy reference.

March 2008

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First Aid and Medical Care

In the event of injury or illness……

1. Call 911, if necessary — Give location and nature of illness or injury.
2. ***Do not move person*** unless there is imminent danger.
   Stop any bleeding.
   Start *artificial respiration* if person is not breathing.
   Connect AED and follow instructions.
   Start *CPR* if person has no pulse.
   Give *FIRST AID* based on your qualifications.
3. *FIRST AID KITS* and *CPR* supplies are located in:

Mail room:	Mounted on wall to left as you enter the room.
WQ Lab:	Mounted on center of back wall.
Break room:	Mounted on wall to left of sink.
Warehouse:	Mounted at work table in the middle of the room.

   AED is located on the wall outside the mail room.

4. Call for additional help, if needed.
5. Comfort person until assistance arrives.

Fire

In the event of a fire….

1. Pull **FIRE ALARM** (located at each exit).
   The Fire Department will automatically be notified.

2. If possible, call 911 and give location and nature of the fire.

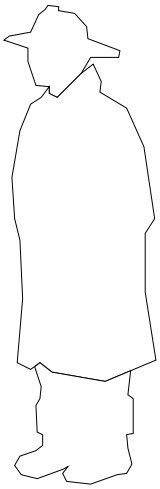
3. Evacuate the building through nearest safe exit (see ***floor plan*** on ***page 24*** of this booklet) and assemble on north lawn. Yellow lines in warehouse indicate exit routes through warehouse. **DO NOT AT ANY TIME block the exit routes.**

Fire extinguishers and alarms …….

are located at each exit.
See ***floor plan*** on ***page 24*** of this booklet to familiarize yourself with exit routes, fire alarms, and extinguisher locations.

False alarm…….

In the event of a false alarm, follow all emergency procedures until the alarm is cancelled.



Hazardous-Material/Nuclear/ Biological/Chemical Threats

In the event of a hazardous material-nuclear-biological-chemical spill or leak or threat outside the building….

Safety Officer or designee will switch on the NOAA weather radio and AM radio at the 1610 frequency to monitor what type of evacuation may be necessary. You will be notified to either:

1. Evacuate to a shelter in place and (a) shut, lock, and tape doors and windows; (b) turn AC/heat/hoods off (anything that can exchange air from the outside); and (c) shut and tape warehouse doors. When clear, open up everything and ventilate. ***OR***
2. Evacuate to area as instructed by authorities over AM 1610.

In the event of a hazardous-material spill or leak inside the building….

1. Cordon off affected area.
2. For dangerous or unidentified material, evacuate the affected area.
3. Immediately notify a supervisor, the Safety Officer (Doug Zettwoch – x1922) or Angie Crain – x1943.
4. Determine extent of the hazard.
5. Refer to MSDS (Material Safety Data Sheets) for emergency procedures.
6. Chemical-spill cleanup should be directed by the Chemical Hygiene Officer (Doug Zettwoch).

7. "Spill Kits" are located in the WQ Lab and in each WQ van.
8. If you have any material spilled on your body or clothes:
   - Use the safety shower/eye wash station located in the WQ Lab.
   - Use the eye wash bottle located in the warehouse.
   - Report your involvement to a supervisor.

Employee Emergency Guidance

Employee and manager responsibilities in the event of a natural disaster or nuclear, chemical, or biological threat.

Several publications are available for employees and managers that provide general guidance in the event of significant natural disasters or terrorist warnings or attacks. The Federal Employees Emergency Guide is posted on the Personnel Board in the lunchroom or you may view this and other publications on the Office of Personnel Management (OPM) website at

http://www.opm.gov/emergency/index.asp#manager

These publications provide helpful information but they do not specifically address the question: "What am I, as a government employee, supposed to do if a terrorist attack or natural disaster occurs when I am off-duty?"

Answer: The Kentucky Water Science Center has a written Continuity of Operations (COO) Plan that describes what managers and employees need to do in case of a major incident. Several excerpts from the plan are listed below.

During duty hours, if an incident occurs that requires the identification or location or status of employees or visitors, key officials would use the paging system or a portable public-address system to have employees convene at a central location, followed by a room-by-room search. If an immediate evacuation of the building was required, or if a lock-down of facility doors, windows, heating and ventilation systems became necessary, all employees and visitors would be notified by the paging system or portable address system and directed to an appropriate location inside the facility. As directed, physically impaired employees and (or) visitors would be assisted. In the event of an evacuation, employees would convene in the parking lot on the north end of the building and await further instructions from a key official.

During off-duty hours, the Senior Facility Manager (Director or designee) is the responsible person to inform management in the event of an emergency. In the aftermath of an incident or event interrupting operations of the USGS facility, **management would be responsible for communicating with their subordinates in the threat of and (or) aftermath of an attack or emergency. Employees are encouraged to check-in with their supervisor after an incident or emergency.**

In the event that the USGS could not occupy its normal headquarters office space, the Director, designee, and (or) successors would relocate to the Federal Building, 600 Dr. Martin Luther King Place, Louisville, Kentucky 40202. **All other employees would be directed to remain home until contacted by supervisors, managers, or other key officials.**

Earthquake

In the event of an earthquake .....

If you are indoors, stay in the building.

- Proceed to nearest designated “safe” area (see ***floor plan*** on ***page 24*** of this booklet).
- Take shelter under tables or desks, in doorways, or in corners.
- Keep away from windows, filing cabinets, and bookcases.
- Enforce “NO SMOKING” policy inside and outside the building.

1. Activate 2-person teams...
   - One team will check exit(s) with chair or broom handle.
   - One team shuts off gas/water valves (NOT electric).
   - Other teams check for injuries and perform necessary first aid.
2. If you are outside, stay outside.
   - Get into an open area, away from buildings, trees, and power lines.
3. Keep calm — Wait for emergency instructions.

If building is to be evacuated ....

1. Proceed calmly.
2. Beware of falling debris or electrical wires as you exit.
3. Evacuate the building through the nearest safe exit (see ***floor plan*** on ***page 24*** of this booklet).

NOTE: There is a chance that the fire alarm could be activated by an earthquake. If the alarm sounds during or immediately after an earthquake, do not evacuate until the shaking stops, unless there is an indication of fire.

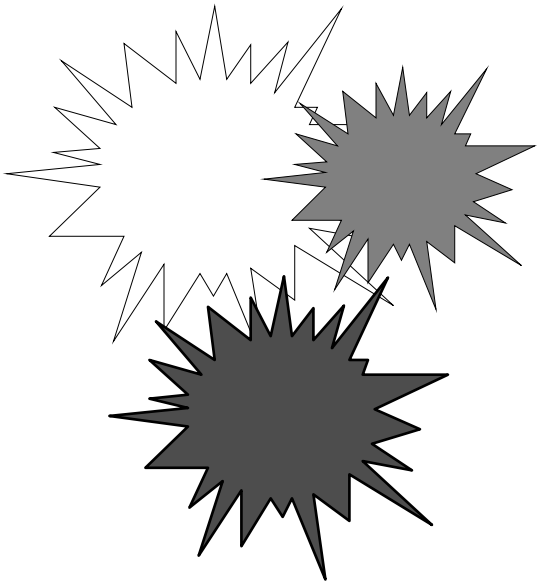
Explosion

In the event of an explosion in the building…..

Take cover under tables or desks.

- Protect yourself against flying glass and debris until effects of the explosion have subsided.
- Call 911 — Give location and details of the explosion.

1. Evacuate the building through nearest safe exit (see ***floor plan*** on ***page 24*** of this booklet).



Evacuation

At the sound of the FIRE ALARM, the building is to be evacuated…

Always use nearest emergency exit.

- Take any personal valuables and coats with you.
- Help any handicapped persons.
- See ***floor plan*** on ***page 24*** of this booklet.
- In the event of an earthquake or explosion, watch for falling debris and live electrical wires (see ***Earthquake*** section on ***page 20*** of this booklet).

1. Everyone should scan their area…
   - To see that no one gets left behind.
   - To spot suspicious packages in a bomb threat.
   - Admin personnel will take sign-in/out book with them as they exit the building.
2. Assemble on the north lawn—along Bluegrass Parkway.
   - Segregate by section so each section can account for missing persons.
   - If you decide to leave, be sure to let people know in your section/unit.
   - Wait for further instructions.
   - Do not re-enter the building until advised by police or fire department personnel.

Tornado Watch

In the event of severe weather, the Safety Officer or designee will stay tuned to NOAA Weather Radio with tone alert and battery backup.

Also, the Safety Officer or designee will tune to AM radio 1610.

An intercom message will be issued to warn you that a tornado watch is in effect, and you should be ready to evacuate to a designated “safe” area (see ***floor plan*** on ***page 24*** of this booklet).

Tornado Warning

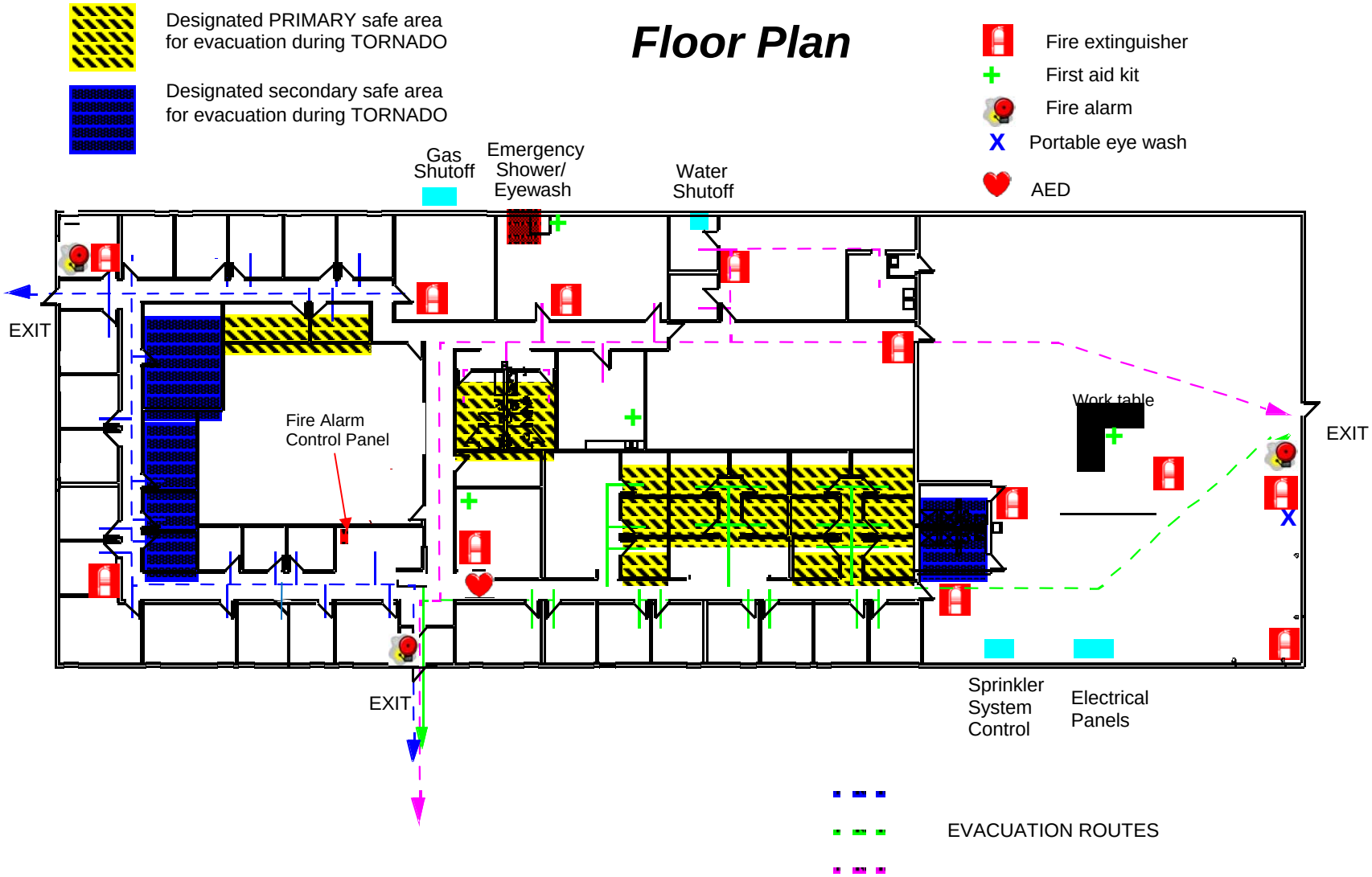
An air horn will be sounded to alert you of approaching tornado.

PLEASE EVACUATE AT THIS POINT TO NEAREST “SAFE” AREA (see **floor plan** on **page 24** of this booklet).

Thunderstorms

Follow procedures for ‘Tornado Watch.’

Floor Plan


Designated PRIMARY safe area for evacuation during TORNADO
Designated secondary safe area for evacuation during TORNADO
Fire extinguisher
First aid kit
Fire alarm
Portable eye wash
AED
Gas Shutoff
Emergency Shower/ Eyewash
Water Shutoff
EXIT
Fire Alarm Control Panel
Work table
EXIT
EXIT
Sprinkler System Control
Electrical Panels
EVACUATION ROUTES

Field Search Procedures

Everyone doing field work is required to call their supervisor at the beginning of each workday and a designated alternate at the end of every field workday. If your supervisor is not available, call the front desk (502) 493-1907 with information.

Calls to supervisor must be made ***before*** 9:00 a.m.

Message must include:

Name of caller
The day's itinerary, if revised

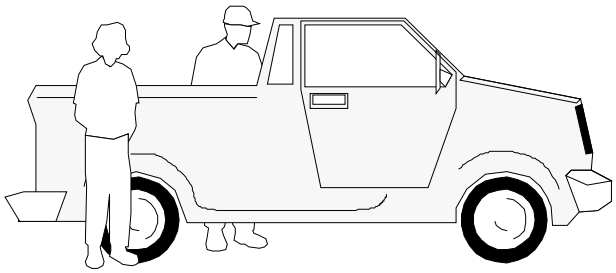
If someone does not call in by designated time….

Contact person may call the following, in listed order, until safety of field person is confirmed:

1. Motel
2. Home or emergency contact (as designated by employee)
3. Supervisor or assistant

If "lost" person is found and safe, inform all persons contacted.

If "lost" person is not found, contact local sheriff/police department.



The Homeland Security Advisory System

1. **Low Condition (Green)**. This condition is declared when there is a low risk of terrorist attacks.

2. **Guarded Condition (Blue)**. This condition is declared when there is a general risk of terrorist attacks.

3. **Elevated Condition (Yellow)**. An Elevated Condition is declared when there is a significant risk of terrorist attacks.

4. **High Condition (Orange)**. A High Condition is declared when there is a high risk of terrorist attacks.

5. **Severe Condition (Red)**. A Severe Condition reflects a severe risk of terrorist attacks.

http://www.dhs.gov/dhspublic

USGS Homeland Security Operations Center

Main/Secure Phone:……..(703) 648-7588
(STU-III, 24/7 operation)
E-mail:……*GS-HSOC@usgs.gov*
Fax:…… (540) 542-2359

What Do You Report to GS-HSOC?

1. **Report requests from anyone for USGS data, information, or assistance**, which is related to any terrorist event or in direct support of any antiterrorist activity or critical infrastructure protection activity.

2. **Report suspicious requests or activity.** It is difficult to define this specifically. Any case in which the information or the requestor is unusual should be reported. Note that if suspicious activity is directly observed, your local security office or law enforcement agency should be notified first.

3. **Report media or congressional requests** for specific information related to terrorist events or anti-terrorist activities. Do not respond to these requests. All media and congressional requests will be forwarded to the USGS Office of Communication for appropriate action.

4. **Report requests for USGS policy** on various related subjects. Some examples have been requests for updated policies on data distribution, security levels, and related items. These will be answered, if possible, or forwarded for further policy development.

Building Security

Security at the Kentucky Water Science Center consists of an intrusion- detection system which, when armed, will send an alarm signal to Alliant Security System whenever one of the protected “zones” has been violated.

On Workdays…

The front door is locked every afternoon at 4:30 p.m.

The last person to leave each day, locks the building and sets the alarm.

The warehouse doors and the wareyard gate should remain closed and locked at all times, unless they are in use.

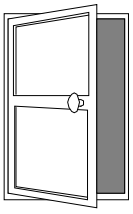
On Weekends and Holidays…

The building is locked, and the alarm is set.

Locking doors…

At the end of each workday, the last employee leaving the ADP room, the WQ lab, the sediment lab, and the warehouse should turn off the lights and lock the door(s) behind them.

ALSO, the two front doors are to be locked and the alarm set as the last employee leaves for the day.



Building Security—Continued

Arming and disarming the alarm…

To ARM…

Ensure all persons are out of the building, and all doors are locked.

The indicator light on the keypad should be green.

Press “away” on the keypad for 2 seconds.

You now have 60 seconds to exit the building.

After 60 seconds the system will arm, and the indicator light will change to red.

To DISARM…

Enter the building through the front door only.

You now have 30 seconds to disarm the system.

Enter the system code.

When the light changes from red to green, the system is disarmed.

FALSE ALARMS…

If you accidently trip the alarm, ANSWER THE PHONE IN THE MAILROOM when the alarm company calls the office. Give them your name and the password to cancel the alarm. **If you do not answer the phone in time, CALL the alarm company as soon as possible using the preset AutoDial button on the receptionist’s phone labeled “Alarm Command Center”** (1-800-318-9486) **so they will not call the police and (or) USGS personnel.**

Wareyard Security

Security for the Kentucky Water Science Center wareyard...

Consists of an alarm system with electronic beams that will sound a siren and turn on a flashing blue light when tripped.

Key USGS personnel will then be notified by Alliant Security System that the alarm has been tripped. *The* **POLICE WILL NOT BE NOTIFIED AT THIS TIME***.*

The alarm will be armed each evening as the last person leaves the office. The alarm will be disarmed each morning as the first person arrives at the office.

Alarm will be armed 24 hours a day on weekends and holidays.

If you accidently trip the alarm, ***ANSWER THE PHONE*** when the alarm company calls the office. Give them your name and the password to cancel the alarm.

If you do not answer the phone in time, CALL the alarm company as soon as possible at 1-800-318-9486, so they will not call the police and (or) USGS personnel.

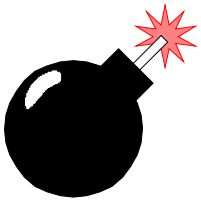
You must identify yourself with the password to cancel the alarm.

In case of a valid alarm—when the building has been entered illegally— the police will be automatically notified and the alarm company will call the first available person from the following list to meet the police at the site:

Doug Zettwoch

- Brian Moore
- Mike Unthank
- Mark Ayers

Bomb Threat



Bomb threat….

Bomb threats are *generally* received by telephone.

They also can be received orally, by mail, or as written messages.

See specific instructions and complete the questionnaire on the following pages.

If a bomb is found….

1. DO NOT TOUCH IT!

   Make mental notes of the following:

Exact location and size of object

- Type of container or wrappings
- Any sound(s) coming from object

2. Evacuate the building through the nearest safe exit
   (see ***floor plan*** on ***page 24*** of this booklet).
   - Pull FIRE ALARM
   - Leave doors open
   - Call 911 — Give location and details of what you found

How to Handle a Bomb Threat

Oral threat….

This includes persons claiming to be carrying a bomb, as well as those claiming to know that a bomb has been placed.

1. To the extent possible, go through the motions of meeting any demands. Do not offer resistance.
2. Get a good mental picture of the person:

   Face and hair …… ✓

   Clothes…… ✓

   Speech…… ✓

3. Anyone in background who can move away from area unnoticed:

   Call 911 — Give location and details of the threat

   Notify a supervisor

Written threat….

1. Remain calm — Leave message where you found it.
2. Call 911 — Give location and details of the threat.
3. Notify a supervisor.

If threat is imminent….

1. Evacuate the building through the nearest safe exit.
   (see ***floor plan*** on ***page 24*** of this booklet)
2. Pull *FIRE ALARM.*
3. Call 911 — Give location and details of the threat.

Bomb Threat Questionnaire

KEEP CALM… Do not get excited… Do not excite others…

Time call is RECEIVED_____ TERMINATED_____

DATE_____

YOUR NAME_____

Exact words of caller: _____

_____ (Delay—Ask caller to repeat.)

QUESTIONS to ask:

- *At what time is bomb set to explode?_____*
- *Where is it located?_____ Floor_____ Area_____*
- *What kind of bomb is it? _____*
- *Describe the bomb: _____*
- *Why do you want to kill or injure innocent people? _____*

  _____

  _____

Bomb Threat Questionnaire—*Continued*

DESCRIPTION OF VOICE:

Male____ Female____ Calm____ Nervous____

Young____ Middle-aged____ Old____

Rough____ Refined____

Accent____ Speech Impediment____

Other description: _____

Unusual phrases? _____

Recognize the voice? _____ If so, who? _____

Did caller indicate knowledge of facility?____

If so, how? _____

BACKGROUND NOISE:

Music_____ Running motor (type?)_____

Traffic____ Whistles_____ Bells_____ Horns_____ Aircraft_____

Tape recorder_____ Machinery_____ Other_____

Office Phone System Operating Instructions

To retrieve *general* voice-mail messages:

Dial **493-1899**
Enter ext. **1907 #**
Enter password + '# '

To retrieve *night-box* voice-mail messages:

Dial **493-1899**
Enter ext. **2099 #**
Enter password + '#'

To retrieve *personal* voice-mail messages:

Dial **493-1899**
Enter your extension
Enter your password

To send a *voice-mail message to all employees*:

Dial **493-1899**
Enter ext. **1907 #**
Enter password + ' **#'**
Enter **1**
Record message **#**
Enter ***5**
Enter **1907 #**
Enter **568 #**
Enter **#**
Enter **2**
Enter **#**

To use phone as *Intercom*:

Use **PAGE** feature on mailroom phone ***or*** warehouse phone.

APPENDIX C

CHEMICAL HYGIENE PLAN (CHP) RESPONSIBILITIES

1. **Laboratory supervisor: The laboratory supervisor is assigned and has overall responsibility for chemical safety in the laboratory. The supervisor has the following specific responsibilities, as a minimum:**

   a) Ensures that a CHP is prepared for the laboratory, employees know and follow the Plan, appropriate and proper personal protective equipment is available and used, and training has been conducted.

   b) Ensures that regular inspections are conducted and that substandard or hazardous acts or conditions are corrected.

   c) Ensures that good-housekeeping practices are in effect and that equipment such as hoods, showers, and eyewashes are in working order.

   d) Knows the current legal requirements of regulated chemicals and ensures that hazardous wastes are disposed of properly.

   e) Ensures that a chemical inventory is completed annually for those areas assigned.

   f) Reviews the Chemical Hygiene Plan annually to ensure that the Plan is up-to-date.

2. **Collateral Duty Environmental Program Coordinator (CDEPC):**

   (a) The CDEPC is responsible to verify that the laboratory supervisor performs all responsibilities.

   (b) Assists employees in obtaining Material Safety Data Sheets.

   (c) Identifies all unattended, overnight laboratory operations, reviewing and recommending failsafe devices or procedures designed to prevent an accident in the event of a component failure.

   (d) Review and report all laboratory accidents involving hazardous materials and recommends steps to prevent recurrence of similar accidents.

3. **Laboratory employee:**

   (a) Plans and conducts all laboratory operations in accordance with the Chemical Hygiene Plan for the laboratory.

   (b) Participates in the completion of the annual chemical inventory.

   (c) Practices good personal hygiene when working with hazardous chemicals, using required personal protective equipment and engineering controls.

   (d) Make supervisor and others in authority aware of changing health/medical condition, which would make it necessary to reevaluate the Job Hazard for them. EXAMPLE- pregnancy.

APPENDIX D

ANNUAL ENVIRONMENTAL RISK ASSESSMENT LOG

AERAL FY _____

ORGANIZATION: USGS _____

ADDRESS (BLDG. #): _____

LAB NAME AND RM. #: _____

LAB CLASSIFICATION (circle appropriate description): biological; chemical; electronic; instrument; mechanical/rock crusher; photographic; physics; machine shop

CHIEF SCIENTIST: _____ LAB SUPERVISOR: _____

TEAM COLLATERAL DUTY SAFETY COORDINATOR: _____

NAMES OF WORKERS _____

_____

Is a Chemical Hygiene Plan in place and up to date?	Circle Yes or No
Are written waste-disposal policies in place?	Circle Yes or No
Are drains connected to a neutralization sump?	Circle Yes or No
Are drains connected to a sediment trap / sump?	Circle Yes or No

MATERIALS ENTERING DRAINS

CHEMICALS: (List each by name and approximate monthly usage)

METALS (in sol'n or solid) _____

_____

ORGANICS (insoluble solvents and compounds) _____

_____

_____

ACIDS: _____

_____

BASES: _____

_____

RADIOACTIVE MATERIALS: _____

_____

GEOLOGIC SAMPLE RESIDUES: Circle Yes (Y) or No (N)

Clays: Y N Sand/Silt: Y N Rock Debris: Y N Rock Saw Oils: Y N

Trace Metals: Y N Drilling Mud: Y N Rock Suspensions: Y N

VOLATILE MATERIALS EXHAUSTED BY HOODS

CHEMICALS: (List each by name or formula and approximate monthly usage)

ORGANICS (volatile solvents and compounds): _____

_____

INORGANICS (compounds / solutions):

_____

ACIDS: _____

BASES: _____

RADIOACTIVE MATERIALS (is hood filtered? Y N): _____

_____

_____ _____

Chief Scientist or Representative's Signature Lab Supervisor's Signature

APPENDIX E

LIST OF SELECT AND SUSPECTED CARCINOGENS (Revised 01/1996)

This list is provided as a guide and is not all-inclusive. Carefully review material safety data sheets before working with chemicals.

A-alpha-C (2-Amino-9H-pyrido {2,3-b]indole)
26148-68-5

Acetaldehyde
76-07-0

Acetamide
60-35-5

Acetochlor
34256-82-1

2-Acetylaminofluorene
53-96-3

Acifluorfen
62476-59-9

Acrylamide
79-06-1

Acrylonitrile
107-13-1

Actinomycin D
50-76-0

Adriamycin (Doxorubicin hydrochloride)
23214-92-8

AF-2; [2-(2-furyl)-3-(5-nitro-2-furyl)]acrylamide
3588-53-7

Aflatoxins

Alachlor
15972-60-8

Aldrin
309-00-2

Allyl chloride
107-05-1

2-Aminoanthraquinone
117-79-3

p-Aminoazobenzene60-09-3

ortho-Aminoazotoluene
97-56-3

4-Aminobiphenyl (4-aminodiphenyl)
92-67-1

3-Amino-9-ethylcarbazole hydrochloride
6109-97-3

1-Amino-2-methylanthraquinone
82-28-0

2-Amino-5-(5-nitro-2-furyl)-1,3,4-thiadiazole
712-68-5

Amitrole
61-82-5

Aniline
62-53-3

ortho-Anisidine
90-04-0

ortho-Anisidine hydrochloride
134-29-2

Antimony oxide (Antimony trioxide)
1309-64-4

Aramite
140-57-8

Arsenic (inorganic arsenic compounds)

Asbestos
1332-21-4

Auramine
492-80-8

Azaserine
115-02-6

Azathioprine
446-86-6

Azacitidine
320-67-2

Azobenzene
103-33-3

Benz[a]anthracene
56-55-3

Benzene
71-43-2

Benzidine [and its salts]
92-87-5

Benzo [b] fluoranthene
205-99-2

Benzo [j] fluoranthene
205-82-3

Benzo [k] fluoranthene
207-08-9

Benzofuran
271-89-6

Benzo [a] pyrene
50-32-8

Benzotrichloride
98-07-7

Benzyl chloride
100-44-7

Benzyl violet 4B
1694-09-3

Beryllium and beryllium compounds

Betel quid with tobacco

Bis(2-chloroethyl)ether
111-44-4

N,N,-Bis(2-chloroethyl)-2-naphthylamine (Chlornapazine)
494-03-1

Bischloroethyl nitrosourea (BCNU) (Carmustine)
154-93-8

Bis (chloromethyl) ether
542-88-1

Bitumens, extracts of steam-refined and air-refined

Bracken fern

Bromodichloromethane
75-27-4

Bromoform
75-25-2

1,3-Butadiene
106-99-0

1,4-Butanediol dimethanesulfonate (Busulfan)
55-98-1

Butylated hydroxyanisole
25013-16-5

beta-Butyrolactone
3068-88-0

Cadmium and cadmium compounds

Captafol
2425-06-1

Captan
133-06-2

Carbon tetrachloride
56-23-5

Carbon-black extracts

Ceramic fibers

Chlorambucil
305-03-3

Chloramphenicol
56-75-7

Chlordane
57-74-9

Chlordecone (Kepone)
143-50-0

Chlordimeform
115-28-6

Chlorendic acid
115-28-6

Chlorinated paraffins
108171-26-2

Chlorodibromethane
124-48-1

Chloroethane (Ethyl chloride)
75-00-3

1-(2-Chloroethyl)-3-cyclohexyl-1-nitrosourea
13010-47-4

1-(2-Chloroethyl)-3-(4-methylcyclohexyl)-1-nitrosourea (Methyl-CCNU)
13909-09-6

Chloroform
67-66-3

Chloromethyl methyl ether
107-30-2

3-Chloro-2-methylpropene
563-47-3

4-Chloro-ortho-phenylenediamine
95-83-0

p-Chloro-o-toluidine
95-69-2

Chlorothalonil
1897-45-6

Chlorozotocin
54749-90-5

Chromium (hexavalent)

Chrysene
218-01-9

C. I. Acid Red 114
6459-94-5

C. I. Basic Red 9 monohydrochloride
569-61-9
Ciclosporin (Cyclosporin A; Cyclosporine)
59865-13-3;79217-60-0

Cinnamyl anthranilate
87-29-6

Cisplatin
15663-27-1

Citrus Red No. 2
6358-53-8

Cobalt metal powder
7440-48-4

Cobalt [II] oxide
1307-96-6

Conjugated estrogens

Creosotes
---

para-Cresidine
120-71-8

Cupferron
135-20-6

Cycasin
14901-08-7

Cyclophosphamide (anhydrous)
50-18-0

Cyclophosphamide (hydrated)
6055-19-2

D&C Orange No. 17
346-83-1

D&C Red No. 8
2092-56-0

D&C Red No. 9
5160-02-1

D&C Red No. 19
81-88-9

Dacarbazine
4342-03-4

Daminozide
1596-84-5

Dantron (Chrysazin; 1,8-Dihydroxyanthraquinone)
117-10-2
Daunomycin
20830-81-3

DDD (Dichlorodiphenyldichloroethane)
72-54-8

DDE (Dichlorodiphenyldichloroethylene)
72-55-9

DDT (Dichlorodiphenyltrichloroethane)
50-29-3

DDVP (Dichlorvos)
62-73-7

N,N'-Diacetylbenzidine
613-35-4

2,4-Diaminoanisole
615-05-4

2,4-Diaminoanisole sulfate
39156-41-7

4,4'-Diaminodiphenyl ether (4,4'-Oxydianiline)
101-80-4

2,4-Diaminotoluene
95-80-7

Diaminotoluene (mixed)

Dibenz[a,h]acridine
226-36-8

Dibenz[a,j]acridine
224-42-0

Dibenz[a,h]anthracene
53-70-3

7H-Dibenzo[c,g]carbazole
194-59-2

Dibenzo[a,e]pyrene
192-65-4

Dibenzo[a,h]pyrene
189-64-0

Dibenzo[a,i]pyrene
189-55-9

Dibenzo[a,l]pyrene
191-30-0

1,2-Dibromo-3-chloropropane (DBCP)
96-12-8
p-Dichlorobenzene
106-46-7

3,3'-Dichlorobenzidine
91-94-1

1,4-Dichloro-2-butene
76441-0

3,3'-Dichloro-4,4'-diaminodiphenyl ether
28434-86-8

1,1-Dichloroethane
75-34-3

Dichloromethane (Methylene chloride)
75-09-2

1,2-Dichloropropane
78-87-5

1,3-Dichloropropene
542-75-6

Dieldrin
60-57-1

Dienestrol
84-17-3

Diepoxybutane
1464-53-5

Diesel engine exhaust

Di(2-ethylhexyl)phthalate
117-81-7

1,2-Diethylhydrazine
1615-80-1

Diethyl sulfate
64-67-5

Diethylstilbestrol
56-53-1

Diglycidyl resorcinol ether (DGRE)
101-90-6

Dihydrosafrole
94-58-6

3,3'-Dimethoxybenzidine (ortho-Dianisidine)
119-90-4

3,3'-Dimethoxybenzidine dihydrochloride (ortho- Dianisidine dihydrochloride)
20325-40-0
Dimethylcarbamoyl chloride
79-44-7

1,1-Dimethylhydrazine (UDMH)
57-14-7

1,2-Dimethylhydrazine 540-73-8

Dimethylvinylchloride
513-37-1

1,6-Dinitropyrene
42397-64-8

1,8-Dinitropyrene
42397-65-9

2,4-Dinitrotoluene
121-14-2

1,4-Dioxane
123-91-1

Diphenylhydantoin (Phenytoin)
57-41-0

Diphenylhydantoin (Phenytoin), sodium salt
630-93-3

Direct Black 38 (technical grade)
1937-37-7

Direct Blue 6 (technical grade)
2602-46-2

Direct Brown 95 (technical grade)
16071-86-6

Disperse Blue 1
2475-45-8

Epichlorohydrin
106-89-8

Erionite
12510-42-8

Estradiol 17ß
50-28-2

Estrone
53-16-7

Ethinylestradiol
57-63-6

Ethyl acrylate140-88-5

Ethyl methanesulfonate
62-50-0

Ethyl-4-4'-dichlorobenzilate
510-15-6

Ethylene dibromide
106-93-4

Ethylene dichloride (1,2-Dichloroethane)
107-06-2

Ethylene oxide
75-21-8

Ethylene thiourea
96-45-7

Ethyleneimine 151-56-4

Folpet
133-07-3

Formaldehyde
50-00-0

2-(2-Formylhydrazino)-4-(5-nitro-2-furyl)thiazole
3570-75-0

Furazolidone
67-45-8

Furmecyclox
60568-05-0

Glu-P-1 (2-Amino-6-methyldipyrido[1,2-a:3',2'- d]imidazole)
67730-11-4

Glycidaldehyde
765-34-4

Glycidol
556-52-5

Griseofulvin
126-07-8

Gyromitrin (Acetaldehyde methylformylhydrazone)
16568-02-8

HC Blue 1
2784-94-3

Heptachlor76-44-8

Heptachlor epoxide
1024-57-3

Hexachlorobenzene
118-74-1

Hexachlorocyclohexane (technical grade)

Hexachlorodibenzodioxin
34465-46-8

Hexachloroethane
67-72-1

Hexamethylphosphoramide
680-31-9

Hydrazine
302-01-2

Hydrazine sulfate
10034-93-2

Hydrazobenzene (1,2-Diphenylhydrazine)
122-66-7

Indeno [1,2,3-cd]pyrene
193-39-5

IQ (2-Amino-3-methylimidazp[4,5-f]quinoline)
76180-96-6

Iron dextran complex
9004-66-4

Isosafrole
120-58-1

Lactofen
77501-63-4

Lasiocarpine
303-34-4

Lead acetate
301-04-2

Lead phosphate
7446-27-7

Lead subacetate
1335-32-6

Lindane

Mancozeb
8018-01-7

Maneb
12427-38-2
Me-A-alpha-C (2-Amino-3-methyl-9H-pyrido[2,3-b]indole)
68005-83-7

Medroxyprogesterone acetate
71-58-9

Melphalan
148-82-3

Merphalan
531-76-0

Mestranol
72-33-3

8-Methoxypsoralen with ultraviolet A therapy
298-81-7

5-Methoxypsoralen with ultraviolet A therapy
484-20-8

2-Methylaziridine (Propyleneimine)
75-55-8

Methylazoxymethanol
590-96-5

Methylazoxymethanol acetate
592-62-1

3-Methylcholanthrene
56-49-5

5-Methylchrysene
3697-24-3

4,4'-Methylene bis(2-chloroaniline)
101-14-4

4,4'-Methylene bis(N,N-dimethyl)benzenamine
101-61-1

4,4'-Methylene bis(2-methylaniline)
838-88-0

4,4'-Methylenedianiline
101-77-9

4,4'-Methylenedianiline dihydrochloride
13552-44-8

Methylhydrazine and its salts
13552-44-8

Methyl iodide
74-88-4

Methyl methanesulfonate
66-27-3
2-Methyl-1-nitroanthraquinone
129-15-7

N-Methyl-N'-nitro-N-nitrosoguanidine
70-25-7

N-Methylolacrylamide
924-42-5

Methylthiouracil
56-04-2

Metiram
9005-42-2

Metronidazole
443-48-1

Michler's ketone
90-94-8

Mirex
2385-85-5

Mitomycin C
50-07-7

Monocrotaline
315-22-0

5-(Morpholinomethyl)-3-[(5-nitro-furfurylidene)-amino]-2 -oxalolidinone
139-91-3

Mustard Gas
505-60-2

Nafenopin
3771-19-5

1-Naphthylamine
124-32-7

2-Naphthylamine
91-59-8

Nickel and certain nickel compounds

Nickel carbonyl
13463-39-3

Nickel subsulfide
12035-72-2

Niridazole
61-47-4

Nitrilotriacetric acid
139-13-9
Nitrilotriacetric acid, trisodium salt monohydrate
18662-53-8

5-Nitroacenaphthene
602-87-9

5-Nitro-o-anisidine
99-59-2

4-Nitrobiphenyl
93-93-3

6-Nitrochrysene
7496-02-8

Nitrofen (technical grade)
1836-75-5

2-Nitrofluorene
607-57-8

Nitrofurazone
59-87-0

1-[5-Nitrofurfurylidene)-amino]-2-imidazolidinone
555-84-0

N-[4-(5-Nitro-2-furyl)-2-thiazolyl]acetamide
531-82-8

Nitrogen mustard (Mechlorethamine)
51-75-2

Nitrogen mustard hydrochloride (Mechlorethamine hydrochloride
55-86-7

Nitrogen mustard N-oxide
126-85-2

Nitrogen mustard N-oxide hydrochloride
302-70-5

2-Nitropropane
79-46-9

1-Nitropyrene
5522-43-0

4-Nitropyrene
57835-92-4

N-Nitrosodi-n-butylamine
924-16-3

N-Nitrosodiethanolamine
1116-54-7

N-Nitrosodiethylamine
55-18-5
N-Nitrosodimethylamine
62-75-9

p-Nitrosodiphenylamine
156-10-5

N-Nitrosodiphenylamine
86-30-6

N-Nitrosodi-n-propylamine
621-64-7

N-Nitroso-N-ethylurea
759-73-9

3-(N-Nitrosomethylamino)propionitrile
60153-49-3

4-(N-Nitrosomethylamino)-1-(3-pyridyl)1-butanone
64091-91-4

N-Nitrosomethylethylamine
10595-95-6

N-Nitroso-N-methylurea
684-93-5

N-Nitroso-N-methylurethane
615-53-2

N-Nitrosomethylvinylamine
4549-40-0

N-Nitrosomorpholine
59-89-2

N-Nitrosonornicotine
16543-55-8

N-Nitrosopiperidine
100-75-4

N-Nitrosopyrrolidine
930-55-2

N-Nitrososarcosine
13256-22-9

Norethisterone (Norethindrone)
68-22-4

Ochratoxin A
303-47-9

Oxadiazon
19666-30-9

Oxymetholone
434-07-1
Panfuran S

Pentachlorophenol
87-86-5

Phenacetin
62-44-2

Phenazopyridine
94-78-0

Phenazopyridine hydrochloride
136-40-3

Phenesterin
3546-10-9

Phenobarbital
50-06-6

Phenoxybenzamine
59-96-1

Phenoxybenzamine hydrochloride
63-92-3

Phenyl glycidyl ether
122-60-1

Phenylhydrazine and its salts
---

o-Phenylphenate, sodium
132-27-4

Polybrominated biphenyls

Polychlorinated biphenyls

Polygeenan
53973-98-1

Ponceau MX
3761-53-3

Ponceau 3R
3564-09-8

Potassium bromate
7758-01-2

Procarbazine
671-16-9

Procarbazine hydrochloride
366-70-1
Progesterone
57-83-0

1,3-Propane sultone
1120-71-4

beta-Propiolactone
57-57-8

Propylene oxide
75-56-9

Propylthiouracil
51-52-5

Reserpine
50-55-5

Saccharin
81-07-2

Saccharin, sodium
128-44-9

Safrole
94-59-7

Selenium sulfide
7446-34-6

Silica, crystalline

Streptozotocin
18883-66-4

Styrene oxide
96-09-3

Sulfallate
95-06-7

Talc' containing asbestiform fibers

Testosterone and its esters
58-22-0

2,3,7,8-Tetrachlorodibenzo-para-dioxin (TCDD)
1746-01-6

1,1,2,2-Tetrachloroethane
79-34-5

Tetrachloroethylene (Perchloroethylene)
127-18-4

p-a, a, a-Tetrachlorotoluene
5216-25-1
Tetranitromethane
509-14-8

Thioacetamide
62-55-5

4,4' - Thiodianiline
139-65-1

Thiourea
62-56-6

Thorium dioxide
1314-20-1

Toluene diisocyanate
26471-62-5

ortho-Toluidine
95-53-4

ortho-Toluidine hydrochloride
636-21-5

para-Toluidine
106-49-0

Toxaphene (Polychorinated camphenes)
8001-35-2

Trasulfan
299-75-2

Trichlormethine (Trimustine hydrochloride)
817-09-4

2,4,6-Trichlorophenol
88-06-2

Triphenyltin hydroxide
76-87-9

Trichloroethylene
79-01-6

Tris (aziridinyl)-para-benzoquinone (Triaziquone)
68-76-8

Tris (1-aziridinyl) phosphine sulfide (Thiotepa)
52-24-4

Tris (2-chloroethyl) phosphate
115-96-8

Tris (2,3-dibromopropyl) phosphate
126-72-7

Trp-P-1 (Tryptophan-P-1)
62450-06-0
Trp-P-2 (Tryptophan-P-2)
62450-07-1

Trypan blue (commercial grade)
72-57-1

Uracil mustard
66-75-1

Urethane (Ethyl carbamate)
51-79-6

Vinyl bromide
593-60-2

Vinyl chloride
75-01-4

4-Vinyl-1-cyclohexene diepoxide (Vinyl cyclohexene dioxide)
106-87-6

Vinyl trichloride (1,1,2-Trichloroethane)
79-00-5

2,6-Xylidine (2,6-Dimethylaniline)
87-62-7

Zineb
12122-67-7

Appendix F

INCOMPATIBILITIES OF COMMON LABORATORY CHEMICALS

When certain hazardous chemicals are stored or mixed together, violent reactions may occur because the chemicals are unsuitable for mixing, or are *incompatible*. Classes of incompatible chemicals should be segregated from each other during storage, according to hazard class. Use the following general guidelines for hazard-class storage:

- Flammable/Combustible Liquids and Organic Acids
- Flammable Solids
- Mineral Acids
- Caustics
- Oxidizers
- Perchloric Acid
- Compressed Gases

Before mixing any chemicals, refer to this partial list, the MSDS of each chemical, or call the ORCBS to verify compatibility:

CHEMICAL	INCOMPATIBLE CHEMICAL(S)
Acetic Acid	aldehyde, bases, carbonates, hydroxides, metals, oxidizers, peroxides, phosphates, xylene
Acetylene	halogens (chlorine, fluorine, etc.), mercury, potassium, oxidizers, silver
Acetone	acids, amines, oxidizers, plastics
Alkali and alkaline earth medals	acids, chromium, ethylene, halogens, hydrogen, mercury, nitrogen, oxidizers, plastics, sodium chloride, sulfur
Ammonia	acids, aldehydes, amides, halogens, heavy metals, oxidizers, plastics, sulfur
Ammonium nitrate	acids, alkalis, chloride salts, combustible materials, metals, organic materials, phosphorous, reducing agents, urea
Aniline	acids, aluminum, dibenzoyl peroxide, oxidizers, plastics
Azides	acids, heavy metals, oxidizers
Bromine	acetaldehyde, alcohols, alkalis, amines, combustible materials, ethylene, fluorine, hydrogen, ketones (acetone, carbonyls, etc.), metals, sulfur
Calcium oxide	acids, ethanol, fluorine, organic materials
Carbon (activated)	alkali metals, calcium hypochlorite, halogens, oxidizers
Carbon tetrachloride	benzoyl peroxide, ethylene, fluorine, metals, oxygen, plastics, silanes
Chlorates	powdered metals, sulfur, finely divided organic or combustible materials
Chromic acid	acetone, alcohols, alkalis, ammonia, bases

CHEMICAL	INCOMPATIBLE CHEMICAL(S)
Chromium trioxide	benzene, combustible materials, hydrocarbons, metals, organic materials, phosphorous, plastics
Chlorine	alcohol's, ammonia, benzene, combustible materials, flammable compounds (hydrazine), hydrocarbons (acetylene, ethylene, etc.), hydrogen peroxide, iodine, metals, nitrogen, oxygen, sodium hydroxide
Chlorine dioxide	hydrogen, mercury, organic materials, phosphorous, potassium hydroxide, sulfur
Copper	calcium, hydrocarbons, oxidizers
Hydroperoxide	reducing agents
Cyanides	acids, alkaloids, aluminum, iodine, oxidizers, strong bases
Flammable liquids	ammonium nitrate, chromic acid, hydrogen peroxide, nitric acid, sodium peroxide, halogens
Fluorine	alcohol's, aldehydes, ammonia, combustible materials, halocarbons, halogens, hydrocarbons, ketones, metals, organic acids
Hydrocarbons (Such as butane, propane benzene, turpentine, etc.)	acids, bases, oxidizers, plastics
Hydrofluoric acid	metals, organic materials, plastics, silica (glass), (anhydrous) sodium
Hydrogen peroxide	acetylaldehyde, acetic acid, acetone, alcohol's carboxylic acid, combustible materials, metals, nitric acid, organic compounds, phosphorous, sulfuric acid, sodium, aniline
Hydrogen sulfide	acetylaldehyde, metals, oxidizers, sodium
Hypochlorites	acids, activated carbon
Iodine	acetylaldehyde, acetylene, ammonia, metals, sodium
Mercury	acetylene, aluminum, amines, ammonia, calcium, fulminic acid, lithium, oxidizers, sodium
Nitraties	acids, nitrites, metals, sulfur, sulfuric acid
Nitric acid	acetic acid, acetonitrile, alcohol's, amines, (concentrated) ammonia, aniline, bases, benzene, cumene, formic acid, ketones, metals, organic materials, plastics, sodium, toluene
Oxalic acid	oxidizers, silver, sodium chlorite
Oxygen	acetaldehyde, secondary alcohol's, alkalis and alkalines, ammonia, carbon monoxide, combustible materials, ethers, flammable materials, hydrocarbons, metals, phosphorous, polymers
Perchloric acid	acetic acid, alcohols, aniline, combustible materials, dehydrating agents, ethyl benzene, hydriotic acid, hydrochloric acid, iodides, ketones, organic material, oxidizers, pyridine
Peroxides, organic	acids (organic or mineral)
Phosphorous (white)	oxygen (pure and in air), alkalis
Potassium	acetylene, acids, alcohols, halogens, hydrazine,

CHEMICAL	INCOMPATIBLE CHEMICAL(S)
	mercury, oxidizers, selenium, sulfur
Potassium chlorate	acids, ammonia, combustible materials, fluorine, hydrocarbons, metals, organic materials, sugars
Potassium perchlorate (also see chlorates)	alcohols, combustible materials, fluorine, hydrazine, metals, organic matter, reducing agents, sulfuric acid
Potassium permanganate	benzaldehyde, ethylene glycol, glycerol, sulfuric acid
Silver	acetylene, ammonia, oxidizers, ozonides, peroxyformic acid
Sodium	acids, hydrazine, metals, oxidizers, water
Sodium nitrate	acetic anhydride, acids, metals, organic matter, peroxyformic acid, reducing agents
Sodium peroxide	acetic acid, benzene, hydrogen sulfide metals, oxidizers, peroxyformic acid, phosphorous, reducers, sugars, water
Sulfides	acids
Sulfuric acid	potassium chlorates, potassium perchlorate, potassium permanganate

APPENDIX G

LIST OF SUBSTANCES REGULATED BY OSHA

1,2-dibromo-3-chloropropane. (1910.1044)

2-Acetylaminofluorene. (1910.1014)

3,3'-Dichlorobenzidine (and its salts) (1910.1007)

4-Aminodiphenyl. (1910.1011)

4-Dimethylaminoazobenzene. (1910.1015)

4-Nitrobiphenyl. (1910.1003)

Acrylonitrile. (1910.1045)

alpha-Naphthylamine. (1910.1004)

Asbestos, tremolite, anthophyllite, and actinolite. (1910.1001)

Asbestos. (1910.1101)

Benzene. (1910.1028)

Benzidine. (1910.1010)

Beta-Naphthylamine. (1910.1009)

beta-Propiolactone. (1910.1013)

bis-Chloromethyl ether. (1910.1008)

Coal tar pitch volatiles; interpretation of term. (1910.1002)

Coke oven emissions. (1910.1029)

Cotton dust. (1910.1043)

Ethylene oxide. (1910.1047)

Ethyleneimine. (1910.1012)

Formaldehyde. (1910.1048)

Inorganic arsenic. (1910.1018)

Lead. (1910.1025)

Methyl chloromethyl ether. (1910.1006)

N-Nitrosodimethylamine. (1910.1016)

APPENDIX H

RADIATION SAFETY GUIDELINES

Radiation

Humankind has been exposed to radiation, in one form or another, since they first inhabited the earth. Ordinary light and heat are common forms of radiation.

In the laboratories, you may encounter other types of radiation. They occur as tiny streams of particles or "rays," which are also referred to as photons (packets of energy) carrying energy from radiation sources. They cannot be seen, felt, or heard. Their presence can be detected, however, with special instruments.

As with toxic substances, exposure to excessive quantities of radiation can be harmful. Such exposures can be prevented by properly following protective procedures. These procedures provide assurance that no deleterious body effects will result from radiation work at the USGS.

Types of Radiation

The most common types of radiation you may encounter in the laboratories are as follows:

Alpha — Alpha radiation is the least penetrating of all types of radiation. Alpha radiation is stopped by clothing or the outer layer of the skin and is of no concern for external exposure. Material emitting alpha radiation may be harmful if taken into your body— by breathing, through cuts or scratches, or in food. Uranium and plutonium are typical emitters of alpha radiation.

Beta — Beta radiation is effectively stopped by plywood or thin sheet metal; however, it does penetrate to the sensitive skin tissue. Simply stepping back a few feet from a beta source will greatly reduce beta exposure to the body. Excessive doses of beta radiation may be harmful to exposed body surfaces. Materials emitting beta radiation also may be harmful when taken into the body in sufficient amounts. Tritium, carbon-14, and strontium-90 are examples of materials that emit beta radiation.

Gamma — Gamma radiation and X-rays penetrate through the skin and often through the body. Dense materials such as concrete, lead, or steel are required for shielding. Gamma radiation, and to a lesser extent X-rays, may be emitted from some radioactive materials; however, X-rays are most often associated with generating machines. Excessive doses received externally may be harmful to the internal organs of the body as well as the skin. Materials emitting these radiations also may be harmful if taken into the body. Cesium-137 and Cobalt-60 are examples of materials that emit gamma radiation.

Radioactive Contamination

Radioactive materials are substances that emit any of the above-mentioned radiations. When radioactive material has escaped from its normal containment, it is called radioactive contamination. Radioactive contamination is often in a form that can be spread to air, liquids, or surrounding surfaces. Radioactive material can be especially harmful if it is taken into the body, so precautions must be taken to prevent bodily intake. For example, wearing protective clothing is one precaution that is taken to protect personnel from becoming contaminated.

Radiation Terminology

You will hear some new words and phrases that relate to radiation and the measurement of radiation. Some of these are as follows:

Rad: Rad is the basic unit of an absorbed dose of radiation. It is simply a label for a specific quantity of any type of radiation, just as the word “foot” describes a specific distance. One-thousandth of a rad, or a millirad, is a more appropriate unit; you will hear that term used more often. Millirad is written as mrad.

Roentgen: The roentgen also is a unit of radiation measurement except that it is limited to X-ray or gamma radiation. A roentgen is commonly written and referred to an as R. A milli-roentgen, or one-thousandth of a roentgen, is written as mR.

Rem: “Rem” is the quantity of any type of radiation that causes the same biological effect as one rad of X-ray or gamma radiation. A millirem is written as mrem.

Dose and Dose Rate: Often you will hear the terms “dose” and “dose rate.” There is an important difference between the two terms. A dose of radiation is the quantity of radiation you have received over a certain period of time. Your dose rate is the rate at which you are receiving radiation at any given time. For example, if you are exposed to a dose rate of 50 mrad/hr, after half an hour the dose you receive would be 25 mrad; after an hour, 50 mrad; after two hours, 100 mrad. It works like the speedometer in your car. It tells you how fast you are traveling (dose rate, speed) and how far you have gone (dose, distance).

Radiation Symbol: Wherever radiation or radioactive contamination exists, or is likely to exist, you will see a radiation warning symbol—usually a magenta-colored or occasionally black “propeller” on a yellow background. It appears on doors, on packages, and on signs. Always heed the warning of this symbol, which indicates there is a source of radiation. It is for your protection!

Radiation Zones: Wherever significant levels of radiation or radioactive contamination are known to exist, a “Radiation Zone” is established. Radiation Zone boundaries are clearly marked by signs bearing the radiation symbol. Eating, smoking, or drinking is not permitted in a radiation zone.

Controlled Zones: Controlled Zones include corridors (exclusive of the administrative area), shop labs not using radioactive materials, locker rooms, and other designated areas wherein protective clothing, excluding shoe covers, is permitted but not mandatory. Food and drink is not permitted in a Controlled Zone. Smoking, unless otherwise posted, is allowed after appropriate self-monitoring.

Uncontrolled Zones: Uncontrolled Zones include all space not identified as a Radiation Zone or Controlled Zone, i.e., lunch rooms and administrative areas. These areas shall be maintained free of contamination or potential contamination at all times. Radiation sources of greater than 1 mrem/hr at any approach are not permitted. Protective clothing is not permitted. Eating, smoking, or drinking is allowed in Uncontrolled Zones.

Radiation Monitoring: Radiation Monitoring is the organization that provides applied radiation protection services in radiation facilities. Many of the staff members who work directly with you to provide this service are called Radiation Monitors.

Dosimeters

Thermoluminescent Dosimeter

Each permanent site employee and selected other individuals (based upon duration of stay and work assignment) are assigned a thermoluminescent dosimeter (TLD). This dosimeter is used to measure the total beta and gamma dose received by the wearer. The dosimeter is exchanged monthly and shipped for analysis by an outside vendor. The result of this analysis is available as indicated later in this plan. This dosimeter, as all dosimeters, shall be worn on the front of the body between the neck and wrist.

Direct Reading Dosimeter

All individuals entering the restricted area and other visitors are assigned direct reading dosimeters (DRD) or pocket ion chambers (PIC), which can be read at any time. You will be given instructions on the method used to read these devices and to properly record your exposure in a personal log. These dosimeters are used to measure the gamma dose received by the wearer.

Direct reading dosimeters are sensitive to shock, so make sure that you read your dosimeter if it is dropped. If the reading is off-scale, report to the site radiation safety officer immediately.

Use and Care of Dosimeters

Personal dosimeters and direct reading dosimeters provide the best available methods of measuring personal exposure. They are not to be tampered with, i.e., opening or exposing to radiation sources other than by normal use.

Your thermoluminescent dosimeter should never be exposed to excessive heat. If your TLD or direct reading dosimeter should ever be damaged or lost, contact the site radiation safety officer immediately to obtain a replacement. Your personal dosimeter should be worn at all times on the job. To give an accurate record of dose, all dosimeters should be worn between the neck and waist on the front of your body. Under no circumstances should your personal dosimeter be worn backwards, i.e., the lettering facing the body. When worn in this manner, the dosimeter cannot properly measure the dose you receive.

Exposure Records

Radiation exposure information pertaining to each individual visiting or working on site is accumulated in “individual exposure records.” These records are maintained as strictly private information. Each employee is given an annual statement of his/her occupational exposure status.

Protective Apparel

Radioactive material dissolved in liquids or reduced to dust particles is capable of spreading in the air or onto surrounding objects. In areas where this radioactive contamination may exist, everyone is required to wear protective apparel to prevent contamination from getting on their skin or personal clothing or into their body.
Protective apparel is furnished as required.

The color of clothing used for protection against radioactive contamination is white or yellow. No other colors of clothing should be substituted, nor should colors of clothing be mixed in dirty-clothes hampers.

Monitoring Instruments

Radiation, as well as some other hazardous materials, cannot be detected by the body senses. Special instruments are used to detect their presence. Some of the instruments used for radiation protection purposes are as follows:

Geiger-Mueller Counter (GM): The GM is sensitive to both beta and gamma radiation. Beta or gamma radiation that penetrates the thin wall of the Geiger-Mueller tube causes pulses of electric current to pass across the tube. The pulse rate is indicated by the dial reading on the GM and also can be heard with the use of a sound emission system. The GM does not measure dose rate.

Cutie Pie (CP): This instrument is used to determine dose rates. Its pistol-like barrel is an ionization chamber that measures beta and gamma radiation. To permit its user to distinguish between beta and gamma responses, there is a movable shield at the end of the barrel to shield out beta radiation. The response is read from a dial on the face of the instrument.

Scintillation Counter: This instrument is sensitive to both beta and alpha radiation. The instrument operates by the production of electrical pulses when radiation causes scintillations of special materials in the instrument probe. The dial reading on the face of the instrument indicates the pulse rate. This instrument generally is used for alpha-radiation surveys.

Bioassay

To provide the best possible protection and control it is necessary to periodically check for internal as well as external exposure. Radioactive materials taken into the body through the mouth, lungs, or breaks in the skin are totally or partially eliminated from the body and normally can be detected in the urine. The purpose of the bioassay program is to provide urinalysis of people who work with radioactive materials.

Bioassay samples may be requested on a routine or special basis depending on the work location and the type and quantity of radioactive materials and your involvement with them. Routine samples are obtained generally on a weekly basis for tritium analysis because of its rapid elimination from the body. Less frequent periodic analyses are performed for radionuclides. Special samples may be obtained during the course of unusual jobs and (or) contamination releases.

APPENDIX I

DEFINITIONS

a. Caustics - a substance that capable of destroying or eating away by chemical action.

b. Combustible Liquids - A liquid having a flash point at or above 100 degrees F (37.8 degrees C) but below 200 degrees F (93.3 degrees C).

c. Compressed Gases – 1. A gas or mixture of gases having in a container, an absolute pressure exceeding psi at 70 F (21.1 C) or; A gas or mixture of gases having, in a container, an absolute pressure exceeding 104 psi at 130 F (54.4 C) regardless of the pressure at 70 F (21.1 C) or; A liquid having a vapor pressure exceeding 40 psi at 100 F (37.8 C) as determined by ASTM D-323-72.

d. Extremely Hazardous Chemical – Any of the 406 chemicals identified by the EPA on the basis of toxicity, and listed under SARA Title III.

e. Flammable Liquid, Class 1A - Any chemical with a flashpoint below 73 degrees Fahrenheit and a boiling point below 100 degrees Fahrenheit.

f. Flashpoint - The minimum temperature at which a liquid gives off a vapor in sufficient concentration to burn in the presence of any ignition source.

g. Hazardous Chemicals - Any chemical that, upon exposure, is known or can reasonably be expected to produce acute or chronic physiological harm. EXAMPLES - corrosives, carcinogens, combustibles, water reactive, etc.

h. Hazardous Materials – Chemicals that fit within any of the hazard classes: Explosives, flammables, oxidizing materials, corrosives, gases, poisons, radioactive substances and agents capable of causing disease.

i. Hazardous Substances – Substances which are deemed to pose imminent and substantial danger to public health and welfare; for example hazardous wastes, water pollutants, air pollutants, and substances that risk damage to the environment.

j. Hazardous Waste – Hazardous waste displays any of the four regulated hazardous characteristics: ignitability, corrosivity, reactivity, and toxicity.

k. JHA (Job Hazard Analysis) – A listing of the job activities, basic job steps, hazards, and safe job procedures of the laboratory which is included in the CHP.

l. Laboratory - Any workplace where relatively small quantities of chemicals are used in a nonproduction basis, multiple chemical procedures or chemicals are used, and protective practices and equipment are available and in common use to minimize exposure to chemicals.

m. Oxidizers - A chemical other than a blasting agent or explosive that initiates or promotes combustion in other materials, thereby causing fire either of itself or through the release of oxygen or other gases.

n. Perchloric Acid - a fuming corrosive strong acid $HClO_4$ that is the most highly oxidized acid of chlorine and a powerful oxidizing agent when heated.

o. Permissible Exposure Limit (PEL) - The concentration of a chemical that one can be exposed for 8 hours per day, 40 hours per week. (See 29 CFR 1910.1000 for existing PEL's.)

p. Select Carcinogen - Any chemical or substance that is known or reasonably expected to cause cancer in humans as recognized by the National Toxicology Program (Department of Health and Human Services) or the International Agency for Research Cancer Monographs.

APPENDIX J Chemical Inventory, Kentucky Water Science Center office, December 2007

[WQL, water-quality laboratory; FC, flammables cabinet; BC, base cabinet; SC, standard cabinet; AC, acid cabinet; Sed. Lab, sediment laboratory; frig., refrigerator]

Chemical Name	Amount Count	Measure	Location	Project(s)	Responsible individual (initials	Expiration date	Inventory date	Remarks
Acetone, 100 percent	750	milliliters	WQL FC	Label removal	CJT/EAS	--	12/03/07	1-500 ml glass bottle; 1-250 ml plastic bottle
Alkaline-Iodide-Azide powder pillows	170	grams	WQL SC	All	ASC	August 2007	12/03/07	Two 50-packs in foil, 85 grams each
Ammonium Hydroxide	9	liters	WQL BC	Dye tracing	CJT	--	12/03/07	Six 2.5-liter glass bottles
Ammonia in Isopropanol Dye Elutant solution	3	liters	WQL FC	Dye tracing	CJT	--	12/03/07	5-percent ammonia in Isopropanol in 1-gallon container
Cobalt Chloride	25	grams	WQL SC	All	ASC		12/03/07	Zero DO Buffer
Formizon Turbidity standard	6.5	liters	WQL SC	NASQAN	ASC	August 2009	12/03/07	Thirteen 500-milliliter amber plastic bottles
Hydrochloric Acid, 5 percent	48	liters	WQL AC	NASQAN/SedLab	ASC/EAS	--	12/03/07	Twelve 4-L plastic jugs to rinse equipment
Hydrogen Peroxide, 30 percent	3.5	liters	WQL BC	Sed Lab use	EAS	--	12/03/07	Seven 500-ml plastic bottles
Isopropanol, 99 percent	3	liters	WQL FC	Dye tracing	CJT	--	12/03/07	Three 1-liter glass bottles
Isopropyl alcohol, 70 percent	4.5	liters	WQL FC	Dye tracing	CJT	--	12/03/07	One 4-liter and one 500-milliliter plastic bottles
Manganous Sulfate powder pillows	220	grams	WQL SC	ALL	ASC	August 2009	12/03/07	Two 50-packs in foil, 110 grams each
Methanol	9	liters	WQLFC	NASQAN	ASC	--	12/03/07	Two 4-liter glass jugs; one 1-liter glass bottle
Nitric Acid, 7.7N	96	milliliters	WQL AC	NASQAN	ASC	05/29/08	12/03/07	Two boxes of 24 each 2-milliliter poly vials
Potassium Hydroxide pellets	25	kilograms	WQL BC	Dye tracing	CJT	--	12/03/07	Five 500-gram jars
Salicylic Acid/Starch Indicator	100	milliliters	WQL SC	All	ASC	August 2009	12/03/07	One 100-ml bottle
Sodium bicarbonate	33	kilograms	WQL locker	To neutralize acid	DDZ	--	12/03/07	47 1-lb boxes; 2 12-lb bags
Sodium carbonate	1000	grams	Sed. Lab cabinet	Sed Lab use	EAS	--	12/03/07	Two 500-gram plastic bottle
Sodium Hexametaphosphate	500	grams	Sed. Lab cabinet	Sed Lab use	EAS	--	12/03/07	One 500-gram jar
Sodium Sulfate	500	grams	WQL SC	All	ASC	12/01/07	12/03/07	Zero DO Buffer
Sodium Thiosulfate solution	2	liters	WQL SC	NASQAN	ASC	--	12/03/07	Two 1-liter amber plastic bottle

Chemical Name	Amount Count	Measure	Location	Project(s)	Responsible individual (initials	Expiration date	Inventory date	Remarks
Sulfamic Acid powder pillows	250	grams	WQL SC	All	ASC	August 2009	12/03/07	50 pillows in plastic jar
Sulfuric Acid, .16N	78	milliliters	WQL NASQAN cabinet	NASQAN	ASC	10/07 08/08 03/09	12/03/07	Six 13-milliliter plastic titration cartridges
Sulfuric Acid, 4.5N (1:7)	48	milliliters	WQL AC	NASQAN	ASC	05/29/08	12/03/07	Two boxes of 24 each 1-milliliter poly vials
Sulfuric Acid (1:1)	126	milliliters	WQL AC	NASQAN	ASC	05/29/08	12/03/07	126 1-ml glass vials in 8 boxes

Chemicals for disposal, Kentucky District office, December 2007

[WQL, water-quality laboratory; BC, base cabinet; mL, milliliter; FC, flammables cabinet; lab, laboratory; AC, acid cabinet; MSDS, Material Safety Data Sheet]

Chemical Name	Amount		Location	Project(s)	Responsible individual (initials	Expiration date	Inventory date	Remarks
	Count	Measure						
Alkaline Iodide-Azide powder pillows	75	1-gram powder pillows	WQL BC	Past MSD project	DDZ	--	12/03/07	Three boxes of 25 each; 1 pillow = 1 gram; contains Li K Na
Hach Mercuric Nitrate	100	mL	WQL BC	Past project	ASC	--	12/03/07	100 mL in glass bottle
Hach Nessler Reagent	200	mL	WQL BC	Past project	DDZ	--	12/03/07	Two 100-mL plastic bottles (contains Hg, NaOH)
Hydrochloric Acid (38%)	20	liters	WQL AC	Past project	DDZ		12/03/07	Eight 2.5-liter bottles
Manganous Sulfate powder pillows	450	grams	WQL BC	Past MSD project	DDZ	--	12/03/07	Nine boxes of 25 pillows; 1 pillow = 2 grams
Mercury batteries, four	4-AA	batteries	WQL BC	Past project	ASC	--	12/03/07	Four AA-batteries Hg.
Mercury (liquid)	4	pounds	WQL BC	From Monometers	DDZ	--	12/03/07	Two 1.5-pound bottles; one 1-pound calibration vessel
Mercury thermometers	552	grams	WQL BC	Lab use	DDZ	--	12/03/07	Thermometers in 2 bags, glass included
Mercury thermometers (2 large lab)	100	grams	WQL BC	Lab use	DDZ	--	12/03/07	One 16-inch lab thermometer One 24-inch lab thermometer
Methanol (Rinsate)	12	liters	WQLFC	NASQAN	ASC	--	12/03/07	Three 4-liter glass jugs
Nitra Ver 6	200	grams	WQL BC	NASQAN	ASC	--	12/03/07	200 foil packs, 1 gram each, Nitrate Reagent
Nitrate test-kit waste	3	liters	WQL AC	Distler	CJT	--	12/03/07	Three 1-liter bottles
Nitri Ver 3	200	grams	WQL BC	NASQAN	ASC	--	12/03/07	200 foil packs, 1 gram each, Nitrite Reagent
Nitric Acid Potassium Dichromate	20	10-mL spent vials	WQL AC	Past project	DDZ	--	12/03/07	Spent vials in 1-liter Nalgene bottle
Resin 2-X8 (anion)	150	grams	WQL BC	NASQAN	ASC	--	12/03/07	In 1-liter Nalgene jar (see MSDS)
Resin 50W=X8 (cation)	150	grams	WQL BC	NASQAN	ASC	--	12/03/07	In 1-liter Nalgene jar (see MSDS)
Sulfamic Acid powder pillows	2,500	grams	WQLAC	Past project	DDZ	--	12/03/07	Five jars of 100 pillows; 1 pillow = 5 grams
Sulfuric Acid (51%)	2.5	liters	WQL AC	Past project	DDZ	--	12/03/07	One 2.5-liter bottle

Reagents from old Hach Kits for disposal, Kentucky District office, December 2007

[WQL, water-quality laboratory; BC, base cabinet]

Chemical Name	Amount		Location	Project(s)	Responsible individual (initials	Expiration date	Inventory date	Remarks
	Count	Measure						
Hach Amino Acid	100	grams	WQL BC	Past project	ASC	--	12/03/07	Two boxes of 50 each powder pillows
Hach Brom Cresol Green Methyl Red	100	grams	WQL BC	Past project	ASC	--	12/03/07	Two boxes of 50 each powder pillows
Hach Bromophenol Blue	100	grams	WQL BC	Past project	ASC	--	12/03/07	Two boxes of 50 each powder pillows
Hach Cal Ver II	100	grams	WQL BC	Past project	ASC	--	12/03/07	Two boxes of 50 each powder pillows
Hach Chlorine Reagent	100	grams	WQL BC	Past project	ASC	--	12/03/07	One box of 100 each powder pillows
Hach Chroma Ver III	100	grams	WQL BC	Past project	ASC	--	12/03/07	Two boxes of 50 each powder pillows
Hach Citrate Buffer	50	grams	WQL BC	Past project	ASC	--	12/03/07	One box of 50 each powder pillows
Hach Citric Acid	100	grams	WQL BC	Past project	ASC	--	12/03/07	Two boxes of 50 each powder pillows
Hach Copper Reagent	50	grams	WQL BC	Past project	ASC	--	12/03/07	One box of 50 each powder pillows
Hach Diphenylcarbazone	50	grams	WQL BC	Past project	ASC	--	12/03/07	One box of 50 each powder pillows
Hach Dissolved Oxygen I	100	grams	WQL BC	Past project	ASC	--	12/03/07	Two boxes of 50 each powder pillows
Hach Dissolved Oxygen II	100	grams	WQL BC	Past project	ASC	--	12/03/07	Two boxes of 50 each powder pillows
Hach Dissolved Oxygen III	25	grams	WQL BC	Past project	ASC	--	12/03/07	One box of 25 each powder pillows
Hach Ferro Ver	100	grams	WQL BC	Past project	ASC	--	12/03/07	Two boxes of 50 each powder pillows
Hach Hydrogen Sulfide	100	grams	WQL BC	Past project	ASC	--	12/03/07	100 test papers in jar
Hach Man Ver II	100	grams	WQL BC	Past project	ASC	--	12/03/07	Two boxes of 50 each powder pillows
Hach Nitra Ver V, contains Cadmium	50	grams	WQL BC	Past project	ASC	--	12/03/07	One box of 50 each powder pillows
Hach Nitri Ver III	50	grams	WQL BC	Past project	ASC	--	12/03/07	One box of 50 each powder pillows
Hach Phenolphlalein	100	grams	WQL BC	Past project	ASC	--	12/03/07	Two boxes of 50 each powder pillows
Hach Phenylarsine Oxide	10	milliliters	WQL BC	Past project	ASC	--	12/03/07	One digital titration cartridge with arsenic

Chemical Name	Amount		Location	Project(s)	Responsible individual (initials	Expiration date	Inventory date	Remarks
	Count	Measure						
Hach Phos Ver II phosphate	25	grams	WQL BC	Past project	ASC	--	12/03/07	One box of 25 each powder pillows
Hach Potassium Persulfate	50	grams	WQL BC	Past project	ASC	--	12/03/07	One box of 50 each powder pillows
Hach Sodium Hydroxide	10	milliliters	WQL BC	Past project	ASC	--	12/03/07	Two digital titration cartridges
Hach Sodium Periodate	100	grams	WQL BC	Past project	ASC	--	12/03/07	Two boxes of 50 each powder pillows
Hach SPADNS Reagent	9	milliliters	WQL BC	Past project	ASC	--	12/03/07	Contains Arsenic and Hydrochloric acid
Hach Sulfa Ver IV, contains Barium	100	grams	WQL BC	Past project	ASC	--	12/03/07	Two boxes of 50 each powder pillows

APPENDIX K

TRAINING LOG

I, the undersigned, have read or reviewed the General Laboratory rules for the **Kentucky District Water-Quality Laboratory, Room 27,** the Emergency Plan, and read and understand the Job Hazard Analysis and procedure description for the task I am to perform. I realize it is my responsibility to:

1. Follow and obey the rules, which are part of the regular operation.

2. Handle equipment properly, follow all safety recommendations, and use the equipment for the task intended.

3. Use and maintain all the required personal protective equipment prescribed for the task.

4. Report accidents and injuries, no matter how minor, to the lab supervisor and to obtain first aid and (or) medical treatment.

5. Perform my job in the correct manner to reduce loss incidents to others, lab, the equipment, and myself.

6. Report all unsafe or hazardous conditions to the lab supervisor as soon as possible.

Print Name	Signature	Date	HAZCOM (or other training)	Date
Angie Cram	Angie Cram	3/1/2004		
Zeke Hensley	Zeke Hensley	3/1/04	Y	5-03
Wayne Eichert	Wayne Eichert	3-1-04	Y	~~4-03~~ 5-03
Timothy Shawn LeMaster	[illegible]	3/1/04	NY	5-03
Paul J. Bruenderman	Paul J. Bruenderman	3/2/04	Y	~~4-03~~ 5-03
BRIAN L. MOORE	Brian L Moore	3/2/04	Y	~~4-03~~
Doug Zettwoch	Doug Zettwoch	3-2-04	Y	~~4-03~~ 5-03
Michael Unthank	Michael S. Unth	3/4/04	Y	5-03
CHARLES J TAYLOR	Charles J Taylor	3/4/04	Y	5-03
Greg McCombs	[illegible]	3/18/04	NoY	— 5-03