US Army Corps
of Engineers

Landfill 5 Cover Improvements at the Former Griffiss Air Force Base Rome, New York

Site Safety and Health Plan Document Series 3 of 5

Conti Environmental, Inc.
South Plainfield, N.J.

July 2002
FINAL

Landfill 5 Cover Improvements
Former Griffiss Air Force Base
Rome, New York

Site Safety And Health Plan

Conti Environmental, Inc.
July 30, 2002
FINAL

DOCUMENT SERIES OVERVIEW

The U.S. Army Corps of Engineers (USACE)–Kansas City District, issued Task Order No. 0001 under Contract No. DACA41-01-D-0004 to Conti Environmental, Inc. Under this Task Order, Conti Environmental, Inc. and its' subcontractor, EA Engineering, P.C. and its affiliate EA Engineering, Science, and Technology have been tasked to prepare documents to support landfill closure activities at the former Griffiss Air Force Base, Rome, New York.

A series of documents has been developed in support of each of the five landfills to be closed. The series includes one primary document, and four supporting documents and associated appendices. The following is a list of the documents in the series developed in support of landfill closure, and an abbreviated description of the document. Bold highlighting indicates which document in the series the reader is currently reviewing.

The Closure Plan is the primary document and is the first document in a series of five documents. The Closure Plan has been developed in accordance with New York Codes, Rules and Regulations Part 360. The Closure Plan provides project history and background information for the site, the regulatory status, the proposed design elements with supporting calculations, specifications and design drawings.

The Project Work Plan is the second document in the series. The Project Work Plan has been developed to outline the scope of work to be implemented and the general methodologies used to execute the scope of work. The plan presents Conti's work approach and sequence of activities for accomplishing the construction of landfill cover improvements. The Project Work Plan also includes, as appendices, the Environmental Protection and Soil Erosion Control Plan and the Traffic Control Plan. The Environmental Protection and Soil Erosion Control Plan outlines the procedures to be implemented to minimize impacts on the surrounding environment during construction. The Traffic Control Plan details the policies and procedures for proper control of vehicles during construction to protect workers and increase efficiency.

The Site Safety and Health Plan is the third document in the series. The Site Safety and Health Plan has been developed to outline the health and safety requirements and guidelines to be followed during construction related activities associated with the landfill closures.

The Contractor Quality Control Plan is the fourth document in the series. The Contractor Quality Control Plan has been developed to outline the policies and procedures to be followed to ensure that proper quality control measures are implemented to provide usable defendable data, ensure compliance with contract drawings and specifications, and to meet contractual requirements with USACE.

The Sampling and Analysis Plan is the fifth document in the series. The Sampling and Analysis Plan has been developed to outline the sampling and analysis procedures to be conducted at each landfill during closure activities.

Former Griffiss Air Force Base – Landfill 5
Rome, New York

Site Safety and Health Plan Approvals

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1.0 INTRODUCTION

Conti Environmental, Inc. is under contract to the US Army Corps of Engineers, Kansas City District Pre-placed Remedial Action Contract for Base Realignment and Closure (BRAC), to perform remedial action activities at the former Griffiss Air Force Base, Rome, New York.

Landfill 5 is scheduled for closure as part of ongoing BRAC activities at GAFB. Certain landfill cover improvements are required at Landfill 5 in advance of closure. The landfill cover improvements include but are not limited to surveying and establishing lines and grades, clearing and grubbing, preparation of subgrade, placement of an 18-inch-thick layer of low-permeability soil over the landfill, placement of topsoil over the landfill as the new top vegetative layer, and providing erosion control.

1.1 Plan Objective

The objective of this Site Safety and Health Plan (SSHP) is to define the requirements and designate protocols to be followed during the Landfill 5 remedial activities at the former Griffiss Air Force Base. Applicability extends to Conti personnel, Conti's subcontractors, and visitors inclusive of USACE personnel and representatives, engineers and subcontractors. Work performed under this contract will comply with applicable Federal, State, and Local Safety and Occupational Health laws and regulations. Through careful planning and implementation of corporate and site-specific safety protocols, Conti will strive for zero accidents and incidents on the project.

1.2 Safety and Health Policy Statement

The Conti Companies management is committed to the safety of each and every employee. There is no place at Conti for an employee who will not work safely or who will endanger the safety of his fellow workers. It is essential that all Managers and Supervisors insist on the maximum safety performance and awareness of all employees under their direction, by enthusiastically and consistently administering all safety rules and regulations. It is the Conti's policy to take the necessary actions, in engineering, planning, designing, assigning and supervising work operations, to create a safe work-site. The Conti Companies will:

- Maintain safe and healthful working conditions.
- Provide and assure the use of all necessary personnel protection equipment to ensure the safety and health of site employees and the public at large.
- Require that site work be planned to provide a range of protection based on the degree of hazards encountered under actual working conditions.
- Provide site workers with the information and training required to make them fully aware of known and suspected hazards that may be encountered and of the appropriate methods for protecting themselves, their co-workers and the public at large.

1.3 Drug and Alcohol Policy

Conti Environmental is committed to providing a safe, efficient, and productive work environment for all employees. Using or being under the influence of drugs or alcohol on the job may pose serious safety and health risks. To help ensure a safe and healthful working environment, employees may be asked to provide body substance samples (such as urine and/or blood) to determine the illicit or illegal use of drugs and alcohol. Refusal to submit to drug testing may result in disciplinary action, up to and including termination of employment.

Under the Drug-Free Workplace Act, an employee who performs work for a government contract or grant must notify Conti Environmental of a criminal conviction for drug-related activity occurring in the workplace. The report must be made within five days of the conviction. Employees with questions on this policy or issues related to drug or alcohol use in the workplace should raise their concerns with their supervisor or the Human Resources Department without fear of reprisal.

Copies of the above drug testing policy (Conti Substance Abuse Program) will be provided to **all employees -**. Employees will be asked to sign an acknowledgement form indicating that they have received a copy of the drug testing policy. Questions concerning this policy or its administration should be directed to the Human Resources Department.

1.4 Project Safety and Health Expectations

The safety and health of workers, clients and the public and the protection of the environment are fundamental responsibility assumed by Conti Environmental under this contract. Conti will:

- Promote project safety with an objective of zero lost-time accident
- Manage activities in a proactive way that effectively increase the protection of site workers, the public and the environment
- Reduce safety and health risk by identifying and eliminating hazards from site activities.
- Carry out site activities in a manner that complies with all applicable safety, health and environmental laws and regulations.

The success of our S&H Program is ensured by our ability to seamlessly integrate our S&H Procedures into a Site Specific Document that establishes safe and healthy work conditions for on-site operations. Conti's success in accomplishing work in a safe and healthy manner is demonstrated by our EMR rating which is well below the industry norm of 1.0, OSHA Recordable Cases and OSHA Compliance History; these statistics are summarized in ***Figure 1 – Safety and Health Statistics***.

Figure 1 - Safety and Health Statistics

	1998	1999	2000	2001
OSHA Recordable Incident Rate	0.00	0.00	0.00	0.00
Lost Work Day Incident Rate	0.00	0.00	0.00	0.00
Number of Hours Worked	142,111	166,006	65,044	51,642
OSHA Recordable Cases	0	0	0	0
Fatalities	0	0	0	0
OSHA Citations	0	0	0	0
EMR	0.78	0.65	0.75	0.62

1.5 Project Safety and Health Compliance Program

Compliance with the requirements of applicable Federal, State and local laws will be accomplished through a combination of written programs, employee training, workplace monitoring, and system enforcement. Continued and regular inspections by supervisors and safety personnel as well as the culture of ownership and total involvement in the safety program will produce an atmosphere of voluntary compliance. However, disciplinary action for violations of project requirements will be taken, when necessary.

All site personnel and visitors entering a Contamination-Reduction Zone and Exclusion Zone at the site will be required to read and verify compliance with the provisions of this SSHP and specific app[illegible]

visitors will be expected to comply with relevant OSHA requirements such as medical surveillance, training, and personal protective equipment. In the event that a person does not adhere to the provisions of the SSHP, he/she will be requested to leave the work area. All nonconformance incidents will be recorded in the Daily Safety and Inspection Log.

The Site Safety and Health Officer will conduct impromptu surveillance on a daily basis of all work areas and subcontractor's activities to ensure that safety, and health is properly implemented. In addition, any reports from employees concerning unsafe work practices, acts, or conditions will be investigated promptly. Unsafe acts, practices, or conditions will be reported to the responsible supervisor at the time of inspection.

The safe and efficient work practices of this company require a spirit of teamwork and cooperation from all employees. Also required are uniform standards of expected behavior. Employees who refuse or fail to follow the standard set forth by this plan, the Conti Companies Safety, Health and Environmental Program and Procedures Manual and/or Regulatory standards, will subject themselves to disciplinary action up to, and including discharge. In cases not specifically mentioned, employees are expected to use good judgment and refer any questions to their supervisors.

1.6 Project Safety Incentive Program

A safe and health project is an efficient and competitive one. We believe attention to safety and health is important to the overall well being of Conti and all of its employees. This Project Safety Incentive Program will serve as a reminder to all of us that *doing it right is doing it safely!*

One of our prime concerns is to provide a safe and healthful work environment for all employees. Cooperation among all project personnel practicing carefully prepared principles of safe operation is the key to the success of the project safety and health program.

Giving safety our attention means safety conscious employees and safer projects. This can be accomplished through an incentive program to promote safety and health on the project. Conti's will establish a project incentive program to recognize exceptional safety and health performance. This project incentive program will consist of two separate incentives. These are the Monthly Safety Lunch Program and the Safety Jackpot Program, which will both add new meaning to the words "Safety Pays."

1.6.1 Monthly Safety Lunch Program

The Monthly Safety Lunch Program will be effective the first day of the project mobilization, after each Month without any OSHA Recordable Injury, ALL project personnel will be treated to a Safety Lunch. The Safety Lunch will be schedule for the Friday past the last day of the Month. Conti will have a raffle at each Safety Luncheon.

1.6.2 Safety Jackpot Program

The Safety Jackpot Program will reward project personnel for safety behavior during the normal course of the project. The Site Safety and Health Officer or a member of the Corporate Team may reward individuals based on safety behavior with Prize Points, which are redeemable for merchandise in the Safety Jackpot Program.

1.7 References

During development of this SSHP consideration was given to current safety and health standards as defined by the U.S. Army Corps of Engineers (USACE), United States Environmental Protection Agency (USEPA), Occupational Safety and Health Administration (OSHA) and the National Institute for Occupational Safety and Health (NIOSH). Specifically, the following reference sources have been utilized in the development of this SSHP:

- OSHA Regulations: 29 CFR 1910 and 1926
- USEPA Standard Operating Safety Guides, June 1992
- NIOSH/OSHA/Coast Guard (USCG)/USEPA "Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities"
- NIOSH Pocket Guide to Chemical Hazards, June 1997
- American Conference of Governmental Industrial Hygienists (ACGIH) Threshold Limit Values for Chemical Substances and Chemical Agents, 2000
- Hazardous Waste Handbook for Health & Safety, Martin, Lippitti, Prothero, 1987
- Handbook of Toxic and Hazardous Chemicals and Carcinogens, Sittig, 1985
- USACE, Safety and Health Requirements, EM 385-1-1, 3 September 1996
- USACE, Safety and Occupational Health Requirements for Hazardous, Toxic, and Radioactive Waste (HTRW) Activities, ER 385-1-92, 1 September 2000
- Remedial Investigation Report, Griffiss Air Force Base, Law Environmental, Inc, 1994
- Former Griffiss Air Force Base Landfill 5, Scope of Work, CENWK, March 2001
- Ordinance and Explosive (OE) Removal Action Report Griffiss Air Force Base, Human Factor Applications, Inc., 30 October 1998.

In addition to the above-referenced documents, Conti has established a comprehensive and realistic Safety, Health and Environmental Program; based on past experience, sound engineering practice, employee training and enforcement of Safety and Health regulations to prevent unreasonable Safety and Health risks. For specific procedures/programs associated with this project, refer to the Conti Safety, Health and Environmental Program, which will be available onsite.

1.8 Site Safety and Health Plan Revisions

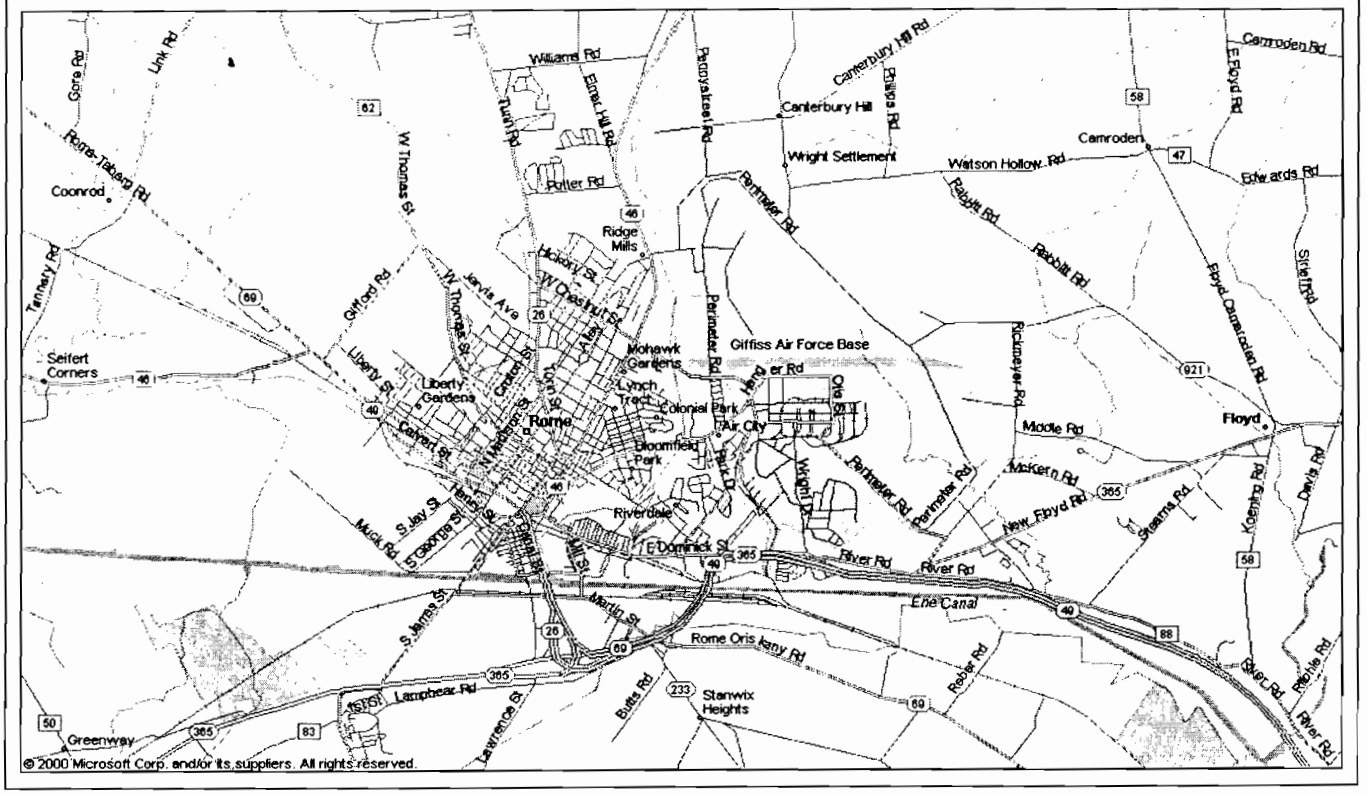
The development and preparation of this Site Safety and Health Plan has been based on site-specific information provided to Conti. Should any unforeseen hazard become evident during the performance of the work, the Site Safety and Health Officer (SSHO) shall bring such hazard to the attention of the Contracting Officer Representative both verbally and in writing for resolution as soon as possible. In the interim, Conti will take necessary actions to maintain safe working conditions in order to safeguard on-site personnel, visitors, the public, and the environment. Modifications of any portion or provisions of the SSHP will be requested in writing from the Contracting Officer by the SSHO, and authorized in writing. No changes to the SSHP will be allowed until the item has been reviewed and an addendum prepared and approved by Safety and Health Manager. Changes to Site Specific Safety and Health Plan will be documented and approved by using the ***"Safety and Health Plan Revision Request Form"*** Refer to Attachment 3 – Safety and Health Forms

1.9 Site Information

Griffiss Air Force Base (GAFB) is a former United States Air Force installation covering approximately 3,552 acres in the lowlands of the Mohawk River Valley in Rome, Oneida County, New York. [illegible] ***"Site Location Map"***. The mission of the GAFB varied over the years. The base was activated [illegible] February 1,

1942, as Rome Air Depot with the mission of storage, maintenance and shipment of material for the US Army Air Corps. Upon creation of the US Air Force in 1947, the depot was renamed Griffiss Air force Base. The base became an electronics center in 1950, with the transfer of Watson Laboratory Complex (later Rome Laboratory). The 49th Fighter Interceptor Squadron was also added in that year. In June 1951, the Rome Air Development Center was established with the mission of accomplishing applied research, development, and testing of electronic air-ground systems. The Headquarters of the Ground Electronics Engineering Installations Agency was added in June 1958 to engineer and install ground communications equipment throughout the world. On July 1, 1970, the 416th Bombardment Wing of Strategic Air Command (SAC) was activated with the mission of maintenance and implementation of both effective air refueling operations and long-range bombardment capability. Griffiss AFB was designated for realignment under the Base Realignment and Closure Act (BRAC) in 1993 resulting in the deactivation of the 416th Bombardment Wing in September 1995. Rome Laboratory and the Northeast Air Defense Sector (NEADS) will continue to operate at their current locations. The New York Air National Guard (NYANG) operated the runway for the 10th Mountain Division deployments until October 1998 when they were relocated to Fort Drum. The Defense Finance and Accounting Services (DFAS) has established an operating location at the former Griffiss AFB.

Figure 2 - Site Location Map



Landfill 5 is located in the south-central portion of the former GAFB, less than 1,000 feet south of the base industrial complex. The landfill is unlined, uncapped and covered by a shallow layer of soil. Landfill 5 comprises of approximately 4 acres. The northern portion of the landfill is flat and covered with grass. The southern portion is covered by dense, brushy undergrowth and is heavily wooded. Although the landfill is well vegetated, wastes protrude from the ground surface in the southern area of the landfill.

Landfill 5 was in operation for one year, 1959, during which an estimated 18,000 cubic yards of municipal wastes were burned and covered at the landfill. It was constructed using an area-type method to a total depth of

6 feet. The southern portion of the landfill was constructed directly on the floodplain of the Three Mile Creek to a height of approximately 12 feet and is adjacent to regulated forested wetland areas. A hardfill area (Hardfill 49D) is located northwest of the landfill.

The landfill is generally flat and the topography of the landfill slopes toward the south and west, with 10 feet of relief occurring across the site. Surface water runoff drains to one of three locations: a wetland southeast of the landfill, Three Mile Creek south of the landfill, and a drainage ditch on the west side of the landfill. Groundwater flows toward the southwest (toward Three Mile Creek) and was encountered at depths of 4 to 10 feet below ground surface (BGS).

2.0 ORGANIZATION AND RESPONSIBILITIES

While the Conti, Inc. Safety and Health Department directs and supervises the overall Safety, Health and Environmental Program, the responsibility for Safety and Health extends throughout our organization from top management to every employee. For this reason, it is each person's duty to notify the management personnel if a hazardous condition is identified and to make a "stop work" call if the condition represents an immediate danger to life or health, until the SSHO can make a further determination. The following are the Conti project personnel positions and responsibilities for this project. Refer to ***Figure 3 – "Organizational Chart"***.

- **Vice President of Operations** Jim Stewart
- **Project Manager:** Tom Hernon
- **Project Superintendent:** Rich Hamlin
- **Safety and Health Manager:** Aldo M. Gonzalez, CSP
- **Certified Industrial Hygienist** Melinda Horan, CIH
- **Occupational Physician:** Dr. Robert MacMillan, EOSI
- **Site Safety and Health Officer:** Kenneth Shultz
- **UXO Support** Leo Carden, SCI UXO/OE Services
- **First Aid/CPR Qualified Personnel:** Rich Hamlin, Project Superintendent
  Kenneth Shultz, Site Safety and Health Officer
- **Subcontractors:** TBD

2.1 Vice President of Operations

The Vice President of Operations directs and manages all aspects of the project in compliance with all contract and technical requirements. The Vice President of Operation will monitor and control all subcontractors to achieve optimal performance and ensure safe, high quality performance that complies with all contract requirements.

2.2 Project Manager

The Project Manager reports to the Vice President of Operations. His responsibilities include coordinating project activities with the Project Superintendent and serving as the primary liaison with the Contracting Officer Rep. The Project Manager prepares all correspondence, submittals, and other documentation required for the project and coordinate, schedules and administers the contract. The Project Manager prepares reports and documentation, supervises inspection personnel, reviews and approves procurement and subcontract activities.

2.3 Project Superintendent

The Project Superintendent supervises and coordinates all construction crew activities relating to site preparation, excavation, and restoration. The Project Superintendent has the operational responsibility for the implementation of the SSHP on this project. This includes establishing an attitude of concern for safety matters by initiating prompt corrective action of hazards brought to his attention and ensuring that the project safety and health requirements are initiated and observed by all project personnel.

The Superintendent plans and requires that all work be performed in compliance with this SSHP, the Conti Companies Safety, Health and Environmental Program and/or the client's safety program including all applicable local, state and federal regulations. He shall impress upon all subcontractors' supervisory personnel a sense of responsibility and accountability of each individual to maintain a safe workplace and to work in a safe manner.

2.4 Safety and Health Manager (SHM)

Responsible to the Program Manager, the Safety and Health Manager formulates, administers and coordinates programs for the company to reduce the risk of loss due to employee injury, regulatory non-compliance, general liability, fire, theft or damage. The Safety and Health Manager will develop written detailed policies and procedures covering elements in the Safety, Health and Environmental Program. The Safety and Health Manager will:

- Be responsible for the development, implementation, oversight and enforcement of the SSHP.
- Conduct initial site-specific training.
- Be present onsite during the first day of remedial activities at the startup of each new major phase.
- Visit the site as needed and at least once per month for the duration of activities, to audit the effectiveness of the SSHP.
- Be available for emergencies.
- Provide onsite consultation as needed to ensure that the SSHP is fully implemented.
- Coordinate any modifications to the SSHP with the Site Superintendent, the SSHO, and the Contracting Officer.
- Provide continued support for upgrading/downgrading of the level of personal protection.
- Be responsible for evaluating air monitoring data and recommending changes to engineering controls, work practices, and PPE.
- Serve as a member of the Contractor' s quality control staff.

2.5 Certified Industrial Hygienist

Under direction of the Safety and Health Manager, the CIH will assist in the development, implementation and enforcement of the Site Specific Safety and Health Plan, provide consultation, review air monitoring data, and assist in safety audits and document review.

2.6 Occupational Physician

Under the direction of the Safety and Health Manager, the Occupational Physician will be responsible for the determination of medical surveillance protocols and for review of examination/test results performed in compliance with 29 CFR 1910.120(f), and 1926.53(f). The Occupational Physician will provide the Safety and Health Manager with a written opinion of each employee's ability to perform hazardous remedial work.

2.7 Site Safety and Health Officer (SSHO)

Under the direction of the Safety and Health Manager, the SSHO shall be responsible for the implementation of this SSHP and for the daily coordination of safety activities with the Project Superintendent and the Contracting Officer Rep. to ensure that the planned work objectives reflect adequate safety and health considerations. The SSHO will submit to the Contracting Officer Rep. Certificates of Worker/Visitor Acknowledgements for site personnel prior to initial entry onto the site. He will maintain a complete copy of this plan (and its supplements and addenda) at the site during all field activities and assure that all workers and visitors are familiar with it. He will perform site-specific training and briefing sessions for employee(s) prior to the start of field activities at the site and a briefing session each day before starting work. He will ensure the availability, proper use and maintenance of specified personal protective equipment, decontamination, and other safety and health equipment. He will maintain a high level of safety awareness among team members and communicate pertinent matters to them promptly. The Site Safety and Health Officer will:

- Assist and represent the Safety and Health Manager in on-site training and the day-to-day on-site implementation and enforcement of the accepted SSHP.
- Be assigned to the site on a full time basis for the duration of field activities. The SSHO will have no duties other than Safety and Health related duties.
- Have the authority to ensure site compliance with specified safety and health requirements, Federal, state and OSHA regulations and all aspects of the SSHP. This includes, but is not limited to: activity hazard analyses, air monitoring; use of PPE, decontamination site control; standard operating procedures used to minimize hazards; safe use of engineering controls; the emergency response plan; confined space entry procedures; spill containment program; and preparation of records. This will be accomplished by performing a daily safety and health inspection and documenting results on the Daily Safety Inspection Log.
- Stop work activities if unacceptable health or safety conditions exist, and take necessary action to re-establish and maintain safe working conditions.
- Consult and coordinate any modifications to the SSHP with the Safety and Health Manager, the Site Superintendent, and the Contracting Officer.
- Serve as a member of the Contractor's quality control staff on matter's relating to safety and health.
- Conduct accident investigations and prepare accident reports.
- Review results of daily quality control inspections and document safety and health findings in the Daily Safety Inspection Log.
- Coordinate with Site Management and the Safety and Health Manager, recommend corrective actions for identified deficiencies and oversee the corrective actions.

2.8 UXO Contractor

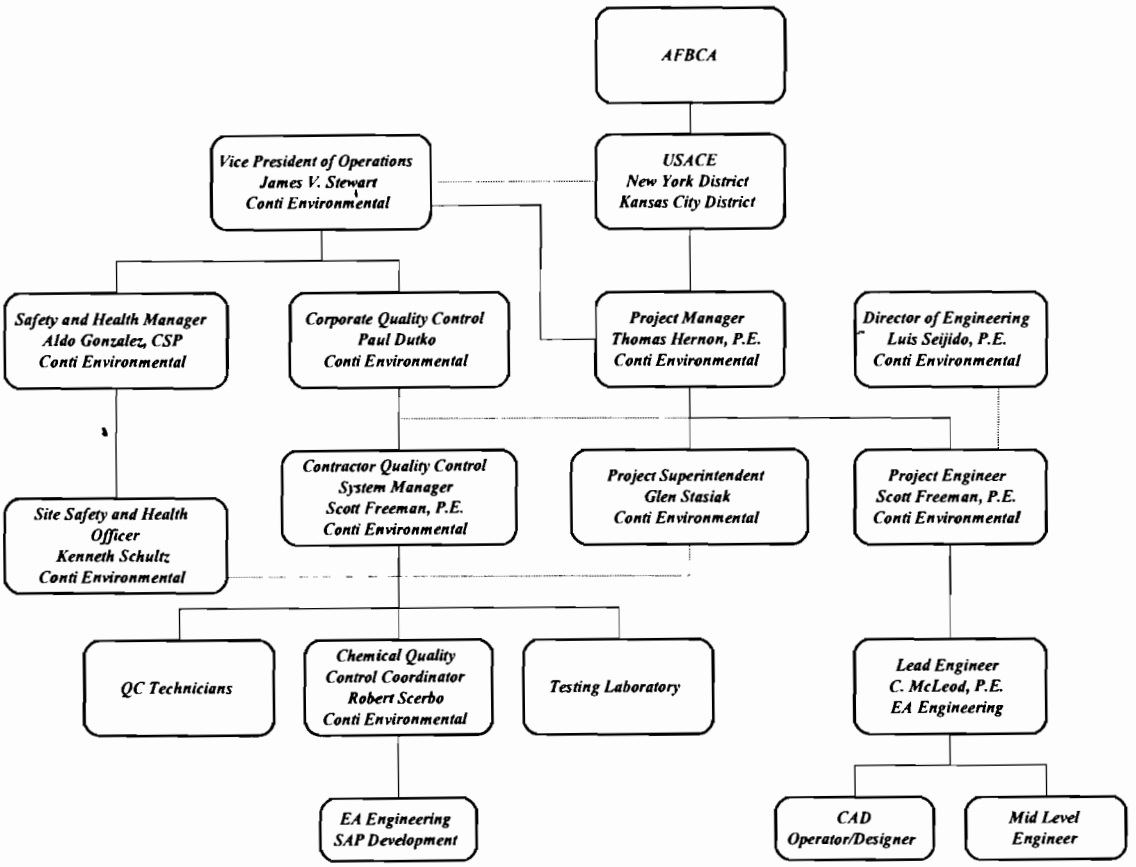
Based on the Archive Search Report, the Conclusions and Removal Action Report and the Statement of Clearance by Human Factors Application, Inc, Explosive/Unexploded Ordnance are not anticipated to be a problem at landfill 5. In the unlikely event that Explosive/Unexploded Ordnance be encounter, Conti Environmental will contract with SCI UXO/OE Services. SCI will provide (if required) UXO/OE Service.

2.9 Subcontractors

Subcontractors utilized during Landfill 5 remedial activities at the former Griffiss Air Force Base are covered by this SSHP and will be provided a copy of the plan prior to commencing work. The Conti SSHO will verify that subcontractor employee training; medical clearance, and respirator fit test records are current and monitor and enforce compliance with the established plan and standard operating procedures. As will include

personnel, subcontractors will be briefed on the provisions of this plan and attend all daily toolbox and weekly safety meetings.

Figure 3 - Organizational Chart



Conti will continually monitor a subcontractor's safety performance. Conti will observe subcontractors for hazards or unsafe practices that are both readily observable and occur in common work areas. The SSHO will note subcontractor work practices on the daily Safety and Health report. If non-compliance or unsafe conditions or practices are observed, the subcontractor safety representative will be notified and corrective action will be required. The subcontractor will determine and implement necessary controls and corrective actions. If repeat non-compliance/unsafe conditions are observed, the subcontractor will be required to stop affected work until adequate corrective measures are implemented.

3.0 HAZARD/RISK ANALYSIS

Uncontrolled hazardous material sites can cause a multitude of health and safety concerns any of which can result in serious injuries and/or illnesses of workers. Some hazards are a function of the physical and chemical nature of the site itself. Others are a direct result of the construction being done. Based upon

information provided to Conti regarding the primary historical uses of the property and the knowledge of the current conditions, the overall Safety and Health hazard assigned to the contemplated activities at the Site is determined to be low to moderate.

3.1 Site Tasks and Operations

The landfill cover improvements include but are not limited to surveying and establishing lines and grades, clearing and grubbing, preparation of subgrade, placement of an 18-inch-thick layer of low-permeability soil over the landfill, placement of topsoil over the landfill as the new top vegetative layer, and providing erosion control. The following is a list of the work to be completed:

- Mobilize to and Demobilize from the project site.
- Provide site safety in compliance with the Site Health and Safety Plan.
- Provide Quality Control measures for duration of project.
- Obtain necessary permits (i.e. wetlands, stream encroachment, etc.)
- Place and maintain temporary erosion and sediment control measures throughout the duration of the project.
- Perform a Pre-Construction Survey.
- Perform clearing and grubbing.
- Survey the site to confirm vertical elevations, establish horizontal control, and provide controls during the work.
- Perform periodic surveying to verify layouts and to calculate volumes of material placed.
- Place and maintain storm water management controls throughout the project.
- Prepare subgrade and provide, place and compact common fill.
- Provide, place and compact low permeability soil cover.
- Utility Pole Removal
- Road Relocation
- Provide and place topsoil.
- Perform final grading and seeding.
- Provide erosion control lining and outlet protection.
- Perform monitoring well decommissioning.
- Provide permanent benchmarks.
- Provide As-Built Drawings of final cap and definable features of work.
- Provide Closure Documentation.

Conti has developed an Activity Hazard Analysis (AHA) for major phase of work of each landfill. A major phase of work is defined as a an operation involving a type of activity presenting hazards not experienced in previous operations or where a new subcontractor or work crew is to perform the specified phase. The analysis will define the activity being performed and identify the sequence of work, the specific hazards anticipated, and the control measures to be implemented to eliminate or reduce each hazard. Refer to ***Attachment 1 - "Activity Hazard Analysis".*** An AHA shall also be prepared when new tasks are added, job situations change, or when it becomes necessary to alter safety requirements. Work will not proceed on a particular task/work area until the AHA has been reviewed and a preparatory meeting has been conducted. General hazards associated with landfill covers and liners activities are described below

A preparatory meeting will be conducted by the SSHO for site personnel prior to their initiating any new or differing site activities. At the preparatory meeting, the SSHO will ensure that site personnel are knowledgeable of the SSHP and understand the hazards and controls of the activity to be performed.

3.2 Hazards

The following potential hazards may be encountered during Landfill 5 remedial activities at the former Griffiss Air Force Base.

3.2.1 Physical Hazards

Potential safety hazards include electrical, heavy equipment/ vehicle traffic; material handling, hot work, and hand and power tools. Safety hazards associated with the project are presented below.

3.2.1.1 Electrical

During activities at Landfill 5 heavy equipment will be operating in the vicinity of an overhead electrical line adjacent to the access road. Equipment Operators will be instructed to keep their distance from overhead electrical lines. Heavy equipment may not work any closer to an overhead electrical line than the 10 Feet. This distance will vary according to voltage the greater the voltage, the greater the clearance between any part of the equipment and the power line Refer to ***Table 1 - Minimum Clearance From Energized Overhead Electrical Lines***. When required, a spotter will be utilized to maintain a safety distance between equipment and overhead wires. The basic rule is "Don't locate equipment in a position where it can come in contact with overhead power lines." Maintain the required distance from the lines. Overhead Electrical power lines will be considered energized unless the person owning such line or operating officials of the electrical utility supplying the line assures that it is not energized and it has been visibly grounded.

Table 1 - Minimum Clearance From Energized Overhead Electrical Lines

Nominal System Voltage	Minimum Rated Clearance
0 to 50 kV	10 Feet (3 m)
51 to 200 kV	15 Feet (4.5 m)
201 to 300 kV	20 Feet (6 m)
3001 to 500 kV	25 Feet (7.5 m)
501 to 750 kV	24 Feet (10.5 m)
751 to 1000 kV	31 Feet (13.5)

There are various means of insulating the wires, as well as barriers and alarms that may be available to reduce the risk of injury to workers, but the use of such devices does not change the requirements of any other applicable standards or laws. In addition, these and other measures (such as grounding the equipment itself) may not be fully effective but may create a false sense of security. Only the utility company is authorized to de-energize, insulate or handle the lines. No one else may attempt these operations.

Electrical equipment used on-site may also pose a hazard to workers. Whenever possible Conti will use low-voltage equipment with ground-fault interrupters and watertight, corrosion-resistant connecting cables to help minimize this hazard. In addition, lightning is a hazard during outdoor operations, particularly for workers handling metal containers or equipment. In the event of an electrical storm, all operations will cease for the duration of the storm.

No employee shall be permitted to work in the proximity of any part of an electrical power circuit unless the person is protected against electric shock by de-energizing the circuit and grounding it, or it has been locked and tagged out. These procedures will be utilized when work has to be performed on energized equipment.

All electrical wiring and equipment shall be intrinsically safe for use in potentially explosive environments and atmospheres. Ground-fault circuit interrupters are standard for use at the site.

For detailed electric safety procedures, refer to SOP 40 – Electrical Procedures in the Conti Safety, Health and Environmental Program and Procedures Manual.

3.2.1.2 Heavy Equipment/Vehicle Traffic

Considerations for controlling the movement of personnel and equipment in a construction area are vitally important to any project, as injuries may occur while working with or adjacent to such equipment. This category includes all operations which utilize moving heavy equipment: excavators, loaders, graders, dozers, and trucks. Conti will take every precaution necessary to ensure the safety of the residents and the on-site personnel during traffic movement operations.

All workers will adhere to all applicable standards and regulations while operating heavy equipment at the site. Operators will be trained and experienced in the use and maintenance of the equipment they are operating. Equipment will be inspected on a daily basis to identify any worn parts, and/or unsafe conditions. Inspections will be documented using the Equipment Checklist, refer to ***Attachment 3 – Safety and Health Forms***. Any unsafe equipment will be removed from service until safety defects can be corrected. Equipment operators will not leave their machine unattended while it is running. Each piece of equipment will be equipped with a 5 lb ABC fire extinguisher. No vehicles or equipment will be operated in a careless or unsafe manner. Personnel will wear high visibility reflective vests when working around equipment/vehicles. All personnel will stay a minimum of 4 ft clear of the operational area of the equipment.

During remedial activities, it is often necessary to have a worker direct the operator. In these cases, close communication between the operator and the laborer is of critical importance. One designated person will give signals to the operator of both equipment and vehicles in the work area. Workers should not take any action unless they have made eye contact with the operator and clearly communicated their intentions. In addition, all machines are equipped with back-up alarms, which are checked daily and repaired immediately. Truck traffic will be controlled by a flagger/spotter, as required.

Maintenance and inspection of vehicles and heavy equipment is a vital part of the overall safety program. Conti has a fully staffed equipment maintenance shop that handles all preventative and overhaul work for our entire vehicle and equipment fleet. As part of the preventative maintenance, all equipment is checked for properly functioning safety devices (e.g., backup alarms, brakes, lights, fire extinguishers, etc.) Before each piece of equipment leaves the shop it must pass a safety checklist. All rental equipment is subjected to a similar inspection when delivered to the job site. Any piece of rental equipment that fails the inspection must be repaired by the vendor before it is accepted for use. In addition, all equipment is inspected in the field prior to the start of each day's activities. If a superintendent, operator, or safety officer detects a defect, a properly qualified mechanic is dispatched from the shop to make the repairs on-site.

For detailed heavy equipment/vehicle traffic safety procedures, refer to SOP 30 – Motor Vehicle and Mechanical Equipment in the Conti Safety, Health and Environmental Program and Procedures Manual.

3.2.1.3 Material Handling

Various materials and equipment may be handled manually during project operations. Care should be taken when lifting and handling heavy or bulky items to avoid back injuries. The following fundamentals address the proper lifting techniques that are essential in preventing back injuries:

- The size, shape, and weight of the object to be lifted must first be considered. Multiple employees or the use of mechanical lifting devices are required for heavy objects.

- The anticipated path to be taken by the lifter should be considered for the presence of slip, trip, and fall hazards.
- The feet shall be placed far enough apart for good balance and stability (typically shoulder width).
- The worker shall get as close to the load as possible. The legs shall be bent at the knees.
- The back shall be kept as straight as possible and abdominal muscles should be tightened.
- Twisting motions should be avoided when performing manual lifts.
- To lift the object, the legs are straightened from their bending position.
- A worker shall never carry a load that cannot be seen over or around.

When placing an object down, the stance and position are identical to that for lifting. The legs are bent at the knees and the object lowered. When two or more workers are required to handle the same object, workers shall coordinate the effort so that the load is lifted uniformly and that the weight is equally divided between the individuals carrying the load. When carrying the object, each worker, if possible, shall face the direction in which the object is being carried. In handling bulky or heavy items, the following guidelines shall be followed to avoid injury to the hands and fingers:

- A firm grip on the object is essential; leather gloves shall be used if necessary.
- The hands and object shall be free of oil, grease, and water which might prevent a firm grip, and the fingers shall be kept away from any points that could cause them to be pinched or crushed, especially when setting the object down.
- The item shall be inspected for metal slivers, jagged edges, burrs, and rough or slippery surfaces prior to being lifted.

For detailed Material Handling procedures, refer to SOP 29 – Material Handling, Storage, Use & Disposal Procedures in the Conti Safety, Health and Environmental Program and Procedures Manual.

3.2.1.4 Hand and Power Tools

Hand and power tools are used for various site activities. Procedures for using hand and power tools are as follows:

- Persons using power tools shall be trained in their use.
- Ground Faults must be present on all electrical tools.
- Only tools in good condition shall be used.
- Tools shall be kept clean.
- Guards and shields shall be kept on all tools.
- Air couplings shall be secured.
- Non-sparking tools shall be used in hazardous areas.
- Proper eye protection is critical when using power tools. At a minimum, safety glasses will be required during site operations. Where appropriate, full-face shields will be utilized in addition to the glasses.

For detailed Hand and Power Tool safety procedures, refer to SOP 25 – Hand and Power Tools Operation Procedures in the Conti Safety, Health and Environmental Program and Procedures Manual.

3.2.1.5 Noise

Noise is found during remedial activities in such operations as transportation of materials and operation of heavy construction equipment. Noise has been defined as unwanted sounds. The human ear can tolerate a certain amount of sound without any harmful effects. The OSHA standard allows 90 dB (A) for eight hours and for a lesser time when the levels exceed 90 db (A). It is usually safe to assume that if you need to shout to be heard at arms length, the noise level is at 90 dB (A) or above. Personnel operating or working around

construction equipment or power tools will utilize hearing protection. Based on the nature of activities to be performed on site, the use of heavy equipment, power tools and other noise producing devices, Conti personnel are enrolled in a Hearing Conservation Program that meets the requirements of OSHA regulation 29 CFR 1910.95 as part of our Medical Surveillance Program. OSHA requires employee to be part of a Hearing Conservation Program when their exposure is 85 dB (A) or above.

Based upon Conti's past experience, it is known that the noise levels emanating from the operation of the heavy equipment often exceed what is allowable for worker exposure. Consequently, equipment operators and personnel working near the equipment are required to wear hearing protection. Conti will provide hearing protection to all site personnel. Additionally, to verify personnel exposure Conti will perform should level measurements during remedial activities.

3.2.1.6 Excavation

The hazard associated with excavation is low to moderate. In general, the hazards encountered during soil excavation are: cave in of excavation sides with possible burial or crushing of workers. Causes of cave ins may include: (a) absence of shoring, (b) misjudgment of stability, (c) defective shoring, and (d) undercut sides. Other potential hazards are: falling during access/egress, while monitoring or dismounting equipment, or stumbling into excavation. An overhead hazard can result from material, tools, rock, and/or soil falling into the excavation. Flammable atmospheres may also be encountered in excavation.

During landfill excavation chemical/hazardous substance may be encountered. Potential chemicals of concern are addressed in Section 3.2.2 Chemical Hazard and Attachment 2 – Material Safety Data Sheets.

Conti will provide adequate shoring or sloping of sides of the excavation. Excavation/trenches will be inspected daily for changing conditions. Air monitoring for airborne contaminants shall be performed in areas where contaminated soils are encountered.

Excavation spoils will be directly loaded into transportation containers or stockpiled and covered at a designated area away from the work area. Excavation/trenches, regardless of the depth or width, shall be barricaded. The use of raised berms, caution signs and caution tape will be instituted to protect both the public and other personnel on the site. The excavation area will be delineated with caution tape during operations and barricaded/secured with safety fence at the end of each workday. Adequate means of exit, such as ladders, steps, ramps or other safe means of egress, will be provided and be within 25 feet of lateral travel.

Where personnel are required to enter excavations over 4 ft) in depth, sufficient stairs, ramps, or ladders will be provided to require no more than 25 ft. of lateral travel. At least two means of exit shall be provided for personnel working in excavations, where the width of the excavation exceeds 100 ft, two or more means of exit shall be provided on each side of the excavation.

For detailed Excavation/Trenching safety procedures, refer to SOP 37– Trenching and Excavation Procedures and SOP 39 – One call Damage Prevention System in the Conti Safety, Health and Environmental Program and Procedures Manual.

3.2.1.7 Slip/Trip/Hit/Fall

Slip/trip/hit/fall injuries are the most frequent of all injuries to workers. They occur for a wide variety of reasons, but all injuries can be prevented by the following prudent practices:

- Spot-check the work area to identify hazards.
- Establish and utilize a pathway, which is most free of slip and trip hazards.

- Beware of trip hazards such as wet floors, slippery floors, and uneven surfaces or terrain.
- Carry only loads, that you can see over.
- Keep work areas clean and free of clutter, especially in storage rooms and walkways.
- Communicate hazards to on-site personnel
- Secure all loose clothing, ties, and remove jewelry while around machinery.
- Report and/or remove hazards.
- Keep a safe buffer zone between workers using equipment and tools.
- Workers must take particular care when walking on the geotextile-working mat.

For detailed Slip/Trip/Hits/Falls prevention procedures, refer to SOP 20 – Fall Protection Program, SOP 27 Stairways and Ladder and SOP36 Signs, Signaling, Tags, and Barricade Procedures in the Conti Safety, Health and Environmental Program and Procedures Manual.

3.2.1.8 Heat Stress

Heat stress may be a hazard for workers wearing protective clothing even if the temperature is moderate. The same protective materials that shield the body from chemical exposure prevent heat and moisture from dissipating. Personal protective clothing can therefore create a hazardous condition. Depending on the ambient temperature and the work being performed, heat stress can occur very rapidly - within as little as 15 minutes.

In its early stages, heat stress can cause discomfort and inattention, resulting in impaired functional abilities that can threaten the safety of both the individual and his co-workers. Personnel will be instructed to recognize the symptoms of the onset of heat stress. While it is not anticipated that heat stress monitoring will be required for this project, the SSHO may periodically check all personnel working in thermal stress areas to ensure that the symptoms are recognized. Frequency of heat stress monitoring and checks for symptoms of heat stress will increase with rises in air temperature, humidity, and the degree of exposure to high temperature areas.

An ambient temperature of 72.5° F when workers are in Level C or higher, will be used as an action level to implement pulse monitoring, oral temperatures and administrative controls, including rest breaks and work rotation, to prevent employees from experiencing heat-related health effects including weight loss. The guidance for workers wearing permeable clothing is specified in the current version of the American Conference of Governmental Industrial Hygienists' (ACGIH) Threshold Limit Values for Heat Stress. If actual Clothing differs from the ACGIH standard ensemble in insulation value and/or wind and vapor permeability, changes should be made to the monitoring requirements and work rest period to account for these differences. ***Table 2 – "Frequency of Physiological Monitoring"*** provides the suggested frequency of physiological monitoring for fit and acclimatized workers.

Table 2 - Frequency of Physiological Monitoring

Adjusted Temperature Calculation	Normal Work Clothing	Impermeable Clothing
90 F (32.2 C) or above	After each 45 minutes of work	After each 15 minutes of work
87.5 - 90.0 F (30.8 - 32.2 C)	After each 60 minutes of work	After each 30 minutes of work
82.5 - 87.5 F (28.1 - 30.8 C)	After each 90 minutes of work	After each 60 minutes of work
77.5 - 82.5 F (25.3 - 28.1 C)	After each 120 minutes of work	After each 90 minutes of work
72.5 - 77.5 F (22.5 - 25.3 C)	After each 150 minutes of work	After each 120 minutes of work

The following parameters should be used when monitoring workers:

Heart rate - Count the radial pulse as early as possible in the rest period to ensure a more accurate reading. If the heart rate exceeds 110 beats per minute at the beginning of the rest period, shorten the next work cycle by

one-third and keep the rest period at the same length. If, at the end of the following work period, the heart rate still exceeds 110 beats per minute, shorten the work period again by one-third.

Oral Temperature - The utilization of oral temperature applies to the time immediately after the worker leaves the contamination reduction zone. Using a clinical thermometer, take the temperature for three minutes. If the oral temperature exceeds 99.6 F (37.6 C), shorten the next work cycle by one-third, without a change to the rest period. If the oral temperature still exceeds 99.6 F (37.6 C) at the end of the following work period, shorten the next work cycle by one-third. Do not permit a worker to perform duties requiring a semipermeable or impermeable garment if the oral temperature exceeds 100.6 F (38.1C). Ear canal readings are a valid method to monitor the temperature of workers who remain in the contamination reduction zone.

The oral temperature shall not exceed 100.4° F. If an employee's pulse rate exceeds the maximum age-adjusted heart rate (0.7(220-AGE)), and/or the oral temperature exceeds 100.4° F, the employee shall be required to stop work and rest at the work site or move to an air-conditioned room after proper decontamination. The affected employee may be allowed to return to work after his/her pulse rate has dropped below 100 beats per minute. The SSHO in consultation with the affected employee, and medical personnel if necessary, shall determine whether an employee is ready to return to work. Fluids shall be provided and rest breaks will be taken. The frequency of breaks will increase with the temperature. Such things as cooling vest; portable fans and breaks in air-conditioned areas shall be used if necessary.

When practicable, the most labor-intensive tasks should be carried out during the coolest part of the day. If necessary, a work/rest regimen will be instituted. The work/rest regimen consists of alternating periods of work and rest. The duration of these alternating periods will depend on the environmental conditions at the job site, i.e., the Wet Bulb Globe Temperature, duration and type of activities performed.

A worker who becomes irrational or confused or collapses on the job should be considered a heat stroke victim, and medical help should be called immediately. Early recognition of symptoms and prompt emergency treatment is the key to aiding someone with heat stroke. While awaiting the ambulance, begin efforts to cool the victim down by performing the following:

- Move the victim to a cooler environment and remove outer clothing.
- Wet the skin with water, and fan vigorously or repeatedly apply cold packs or immerse the victim in a tub of cool (not ice) water.
- If no water is available, fanning will help promote cooling.

Any individual showing susceptibility to heat stress will be referred to a physician for evaluation. In addition, the use of prescription drugs can also contribute to the effects of heat stress and will be considered during the assignment of work.

Cool (50°-60°F) water or a sport drink, such as Gatorade will be made available to workers and encourage them to drink small amounts frequently, e.g., one cup every 20 minutes. Ample supplies of liquids will be placed close to the work area.

For detailed Heat Stress prevention procedures, refer to SOP 26 – Heat and Cold Stress Management in the Conti Safety, Health and Environmental Program and Procedures Manual.

3.2.1.9 Cold Stress

Cold injury (frostbite and hypothermia) and impaired ability to work are hazards to personnel working in low temperatures at or below freezing. Extreme cold for a short time may cause severe injury to exposed body surfaces (frost nip or frostbite), or result in profound generalized cooling (hypothermia). Areas of the body

which have high surface area-to-volume ratio such as fingers, toes, and ears, are the most susceptible to frost nip or frostbite.

Two factors influence the development of a cold weather injury: ambient temperature and the velocity of the wind. Wind chill is used to describe the chilling effect of moving air in combination with low temperature. As a general rule, the greatest incremental increase in wind chill occurs when a wind of 5 mph increases to 10 mph. Additionally, water conducts heat 240 times faster than air. Thus, the body cools suddenly when chemical-protective equipment is removed if the clothing underneath is perspiration soaked. The windchill factor is the cooling effect of any combination of temperature and wind velocity or air movement. ***Table 3 – Windchill Index*** should be consulted when planning for exposure to low temperatures and wind. The windchill index does not take into account the specific part of the body exposed to cold, the level of activity, which affects body heat production, or the amount of clothing being worn.

Table 3 - Wind Chill Index

Wind (mph)	Actual Temperature (° F)												
	35	30	25	20	15	10	5	0	-5	-10	-15	-20	-25
	Equivalent Temperature (° F)												
5	31	25	19	13	7	1	-5	-11	-16	-22	-28	-34	-40
10	27	21	15	9	3	-4	-10	-16	-22	-28	-35	-41	-47
15	25	19	13	6	0	-7	-13	-19	-26	-32	-39	-45	-51
20	24	17	11	4	-2	-9	-15	-22	-29	-35	-42	-48	-55
25	23	16	9	3	-4	-11	-17	-24	-31	-37	-44	-51	-58
30	22	16	8	1	-5	-12	-19	-26	-33	-39	-46	-53	-60
35	21	14	7	0	-7	-14	-21	-27	-34	-41	-48	-55	-62
40	20	13	6	-1	-8	-15	-22	-29	-36	-42	-50	-57	-64

Wind Chill (°F) = 35.74 + 0.6215T - 35.75(V0.16) + 0.4275T(V0.16)
T = Air Temperature (°F)
V = Wind Speed (mph)

Frostbite occurs in 15 minutes or less

When practicable, the most sedentary tasks should be carried out during the warmest part of the day. If necessary, a light-work rotation schedule should be instituted or the work area heated. Heavy work that will cause heavy sweating that will result in wet clothing must also be monitored. The work/rest regimen consists of alternating periods of work and rest. The duration of these alternating periods will depend on the environmental conditions at the job site, i.e., the Wind Chill Temperature, duration and type of activities performed.

Table 4 - Maximum Daily Time Limits for Exposure at Low Temperatures gives the recommended time limits for working in various low temperature ranges.

Table 4 - Maximum Daily Time Limits for Exposure at Low Temperatures

Temperature Range (F)	Maximum Daily Exposure
30 to 0	No limit, providing that the person is properly clothed.
0 to -30	Total work time: 4 hours. Alternate 1 hour in and 1 hour out of the low-temperature area.
-30 to -70	Two periods of 30 minutes each at least 4 hours apart. Total low temperature work time allowed is 1 hour.
-70 to -100	Maximum permissible work time is 5 minutes during an 8-hour working day. At these extreme temperatures, completely enclosed headgear, equipped with a breathing tube running under the clothing and down [illegible] to preheat the air, is recommended.

Table – 5 Work/Warm-up Schedule applies to any 4-hour work period with moderate to heavy work activity, with worm-up periods of ten (10) minutes in a warm location and with an extended break (e.g., lunch) at the end of the 4-hour period in a warm location. For light-to-moderate work (limited physical movement): apply schedule one step lower. For example, at -35° C (-30° F) with no noticeable wind, a worker at a job with little physical movement should have a maximum work period of 40 minutes with 4 breaks in a 4-hour period.

Table 5 - Work/Warm-up Schedule

Air Temperature - Sunny Sky		No Noticeable Wind		5 mph Wind		10 mph wind		15 mph wind		20 mph wind	
^{0}C (approx.)	^{0}F (approx.)	Max Work Period	No. of Breaks	Max Work Period	No. of Breaks	Max Work Period	No. of Breaks	Max Work Period	No. of Breaks	Max Work Period	No. of Breaks
-26^0 to -28^0	-15^0 to -19^0	(Norm. Breaks) 1		(Norm. Breaks) 1		75 min	2	55 min	3	40 min	4
-29^0 to -31^0	-20^0 to -24^0	(Norm. Breaks) 1		75 min	2	55 min	3	40 min	4	30 min	5
-32^0 to -34^0	-25^0 to -29^0	75 min	2	55 min	3	40 min	4	30 min	5	Non-Emergency Work Should Cease	
-35^0 to -37^0	-30^0 to -34^0	55 min	3	40 min	4	30 min	5	Non-Emergency Work Should Cease			
-38^0 to -39^0	-35^0 to -39^0	40 min	4	30 min	5	Non-Emergency Work Should Cease					
-40^0 to -42^0	-40^0 to -44^0	30 min	5	Non-Emergency Work Should Cease							
-43^0 & below	-45^0 & below	Non-Emergency Work Should Cease									

To guard against cold injuries, workers should wear appropriate clothing and use warm shelters for removing personal protective equipment. The personal decontamination trailer will be used as a warm shelter when required. The SSHO may periodically monitor workers' physical conditions, specifically checking for symptoms of frostbite.

For detailed Cold Stress prevention procedures, refer to SOP 26 – Heat and Cold Stress Management in the Conti Safety, Health and Environmental Program and Procedures Manual.

3.2.1.10 Fires, Explosions, and Hot Work

If required the SSHO will establish areas approved for welding, cutting, and other hot work. Hot work (welding, burning, cutting, etc.) conducted on-site must comply with the following Hot Work Procedures. A Hot Work Permit shall be obtained from the SSHO, if required. Notification regarding hot work will be communicated to the Rome Fire Department. All personnel shall be protected from welding radiation, flashes, sparks, molten metal, and slag. All welding, burning, and cutting equipment shall be inspected daily by the operator. Defective equipment shall be tagged and removed from service, replaced or repaired, and re-inspected before again being placed in service. All welders shall be properly trained in the safe operation of their equipment, safe welding/cutting practices, and welding/cutting respiratory and fire protection.

Cutting or welding shall NOT be permitted in the presence of explosive atmospheres (mixtures of flammable/combustible gases, vapors, liquids, or dusts with air), or explosive atmospheres that may develop inside un-cleaned or improperly prepared drums, tanks, or other containers, and equipment which has previously contained such materials.

Where practical, all combustible material shall be relocated at least 35 feet away from the hot work site. Where

relocation is impractical, combustibles shall be protected with flame proofed covers or otherwise shielded. At a minimum, two fully charged and operable fire extinguishers, appropriate for the type of possible fire (10-ABC), shall be available at the work area. A fire watch shall be required whenever hot work is performed and a minimum of 30 minutes after hot work is complete.

A hot work permit will be completed by the SSHO, reviewed with personnel who will perform the hot work, and posted near the work area. The hot work permit is good only for the date issued and is valid only for the eight-hour shift for which it is issued. If at any time during the hot work operation a change in conditions at the work site is suspected, such as a release of flammable gases or vapors in the work area, work shall be stopped immediately and the SSHO shall be notified. Such work stoppage invalidates the hot work permit, and a new permit shall be completed after inspections and tests have been performed by the SSHO. ***Refer to Attachment 3 – Safety and Health Forms for the Hot Work Permit.***

For detailed Fire and Explosion prevention procedures, refer to SOP 21 Fire Prevention and Protection Procedures in the Conti Safety, Health and Environmental Program and Procedures Manual.

3.2.1.11 Oxygen Deficiency

Oxygen deficiency may occur on-site during excavation operations or storage tank entry, due to displacement of oxygen by other gases in these areas. The oxygen content of ambient air is 20.9 percent. Physiological effects of oxygen deficiency are readily apparent when the oxygen concentration decreases below 16 percent. Oxygen-deficient conditions may be controlled by air monitoring areas for oxygen concentrations using an 02/LEL/CO Meter. Air monitoring will reduce risks by indicating when action levels have been exceeded. Supplied-air type respiratory protection shall be utilized in areas known to have oxygen concentrations below 19.5 percent. All operations shall cease and desist if oxygen concentrations exceed 21.5 percent.

3.2.1.12 Ordnance and Explosive /Unexploded Ordnance

Due to that nature of normal military operations, OE and OE-related scrap contamination may exist at the landfill. Based on pre-removal action investigation 10 areas of concern (OE clearance activities) were identified. The risk of Ordnance and Explosive /Unexploded Ordnance is low. Human Factor Applications, Inc. performed an Ordnance and Explosive (OE) Removal Action at Griffiss Air Force Base (Final Removal Action Report, 30 October 1998). Landfill 5 was not identified as an area of concern.

A person's ability to recognize OE/UXO is the first and most important step in reducing the risk posed by a OE/UXO hazard. OE/UXO, whether present in an area by design or by accident, poses the risk of injury or death to anyone in the vicinity. To lessen the danger of UXO hazards and to help prevent placing others at future risk, certain precautions and steps should be taken by anyone who encounters UXO. ***"IF YOU DID NOT DROP IT, DO NOT PICK IT UP!"*** A person can lessen the danger of UXO hazards by being able to recognize the hazard and by adhering to the following basic safety guidelines:

- After identifying potential UXO, do not move any closer to it. Some types of ordnance have magnetic or motion-sensitive proximity fuzing that may detonate when they sense a target. Others may have self-destruct timers built in.
- Do not transmit any radio frequencies in the vicinity of a suspected UXO hazard. Signals transmitted from items such as walkie-talkies, short-wave radios, citizens' band (CB) radios, or other communication and navigation devices may detonate the UXO.
- Do not attempt to remove any object on, attached to, or near a UXO. Some fuzes are motion-sensitive, and the UXO may explode.
- Do not move or disturb a UXO because the motion could activate the fuze, causing the UXO to explode.

- If possible, mark the UXO hazard with a standard UXO marker or with other suitable materials, such as engineer tape, colored cloth, or colored ribbon. Attach the marker to an object so that it is about 3 feet off the ground and visible from all approaches. Place the marker no closer than the point where you first recognized the UXO hazard.
- Leave the UXO hazard area.
- Any UXO discovered in the field should be immediately reported to site Explosive Ordnance Disposal (EOD) personnel
- Stay away from areas of known or suspected UXO. This is the best way to prevent accidental injury or death.

3.2.1.13 Drum Removal

Handling drums and other hazardous waste containers present a multitude of hazards. These hazards include detonations, fires, explosions, vapor generation, and physical injury. Physical injury can result from moving heavy containers by hand and working around stacked drums, heavy equipment and deteriorated drums. While these hazards are always present, proper work practices - such as minimizing handling and using equipment and procedures that isolate workers from hazardous substances - can minimize the risk to hazardous waste site personnel.

For detailed Drum Handling, Opening, Sampling and Storage Procedures, refer to SOP 19 Drum handling Procedures in the Conti Safety, Health and Environmental Program and Procedures Manual.

3.2.2 Chemical Hazards

Waste materials disposed of at Landfill 5; consisting of wastes burned on site and other items (unburned), comprise the source of contamination at Landfill 5. Approximately 18,000 cubic yards of wastes were disposed at this site from 1959 to 1960.

3.2.2.1 Nature and Extent Of Contamination

The nature and extent of contamination at Landfill 5 is based on the Remedial Investigation Report and is summarized below. The passive **Soil Gas** survey indicated volatile organic emissions at all but four locations. ***Chloromethane*** was widespread across the site. Generally, emissions were predominantly detected in the southern area of the landfill; ***acetone*** and ***butanone*** were prevalent in this area. One or more *fuel constituents* were found at 12 locations. *Chlorinated compounds* were detected in isolated instances; however, no pattern of emissions was evident. Other isolated detections included ***carbon disulfide*** and ***styrene***.

Of the three **Surface Soil** samples evaluated, the sample collected from the surface of the landfill was found to exhibit chemicals at the highest frequency and levels. The chemicals detected downgradient from the landfill consisted predominantly of *PAH* compounds and *metals*. ***Total petroleum hydrocarbons*** were found at all three locations with the highest concentration (1,130 mg/kg) detected in the landfill surface soil sample. ***Acetone***, a common laboratory-introduced contaminant, was found in one downgradient sample. *Volatiles* were not detected at the other two locations. *PAH* compounds were detected in all samples; however, soil screening levels for PAHs were exceeded only in the sample from within the landfill. ***Dieldrin*** and ***heptachlor epoxide*** levels also exceeded soil screening levels at this location.

PCB-1254 was identified in the sample from within the landfill at 4,000 µg/kg, exceeding the NYSDEC soil cleanup goal of 1,000 µg/kg. PCBs were not detected in the surface soil samples collected [illegible] Landfill 5. ***Dioxin (2,3,7,8-TCDD)*** was detected from the surface soil from the landfill, [illegible] detected (estimated at 2.1 ng/kg) did not exceed the soil screening levels. ***Dioxin*** was not detected downgradient

from the landfill. A number of inorganics were present in surface soils. **Lead** and **arsenic** levels exceeded soil screening levels in the sample collected from within the landfill. *Metals* in the downgradient samples were found to exceed screening levels for ***arsenic, calcium sodium*** and ***zinc*** at least one location.

Sediments were collected from the pond adjacent to and southeast of Landfill 5, and the drainage ditch west of the landfill. In general, chemicals were detected at greater frequency in the drainage ditch sediments than the pond sediments. Both ***dioxin, furan*** and their congeners were found in both areas. ***Total petroleum hydrocarbons*** were detected at all sediment locations and depths, with highest levels found adjacent to the landfill in the pond. No work will be performed in the Drainage Ditch or Pond Sediment Area under this scope of work.

3.2.2.2 Contaminants of Concern

Based on the Remedial Investigation, the primary contaminants of concern at Landfill 5 include PAHs ***(Benzo (a) anthracene, Benzo (a) pyrene, Benzo (b) fluoranthene, Dibenzo (a,h) anthracene, Indeno (1,2,3-cd) pyrene),*** and PCBs, ***(Aroclor-1254).*** PAHs and PCB levels exceed cleanup goals in the soil. PCBs, pesticides and metals are the primary contaminants found in the sediment (Drainage Ditch- not under this scope of work). Refer to ***"Attachment 2- Material Safety Data Sheets"*** for specific chemical information. Material Safety data sheets for all contaminants detected in Landfill 5 will be available upon request.

The greatest potential for exposure to the chemicals of concern will be during intrusive activities (i.e. soil stripping and subgrade preparation). It is not anticipated that any movement and/or consolidation of landfill waste material will occur. In the event any waste/debris is uncovered during construction, it will covered with common fill material prior to placement of the cover soil.

3.2.2.3 Exposure Route

A primary exposure route of concern at the site is direct contact of the skin and eyes with contaminated material. Air monitoring, using direct reading instruments, for particulate shall be performed during work activities. To protect workers against dermal contact, they will wear specified protective clothing, respirators and safety glasses for operations involving potential exposure to hazardous materials. Proper personal decontamination procedures will be emphasized during remedial construction activities.

Although ingestion should be the least significant route of exposure, employees will be made aware of ways in which this type of exposure can occur and methods to avoid such exposure. Deliberate ingestion of chemicals is unlikely. Personal hygiene habits that provide a route of entry for chemicals will be restricted. Proper decontamination procedures will reduce/eliminate potential of ingesting hazardous materials. Site personnel will wash their hands, face and other exposed parts of their skin before eating or smoking.

3.2.2.4 Operational Chemicals/Hazard Communication Program

Operational chemicals may be brought to the project-site for use in activities supporting the remedial activities. These chemicals are used for fuels in operating heavy equipment, glues for welding pipes, painting, etc. The use of operational chemicals is regulated by OSHA under the Hazard Communication Standard (29 CFR 1910.1200). MSDSs for operational chemicals are kept on file in the project office trailer. An inventory list of the anticipated operational chemicals (Hazardous Chemical Inventory List) for use at the former Griffiss Air Force Base project will be maintained at the site and updated as new material is received.

3.2.3 Biological Hazards

There is a potential for encountering biological hazards such as bites from ticks, rodents, snakes and exposure to poison ivy and oak. Biological hazards and controls are presented below.

3.2.4.1 Ticks

Working in tall grass, especially in or at the edge of wooded areas, increases the potential for ticks to affect workers. Ticks are vectors of many different diseases including; Rocky Mountain spotted fever, Q fever, tularemia, Colorado tick fever, and Lyme disease. They attach to their host's skin and intravenously feed on its blood creating an opportunity for disease transmission. Covering exposed areas of the body and the use of commercially prepared tick repellent, such as N, N-Diethyl-m-toluamide (DEET), help prevent tick bites. Please note that there are some concerns with the use of DEET on skin and associated potential adverse health affects. Periodically during the workday, employees working in tall grass will inspect themselves for the presence of ticks. Notify the SSHO of any tick bites as soon as possible

3.2.4.2 Rodents and Wildlife

During site operations, animals such as woodchuck, rabbits, deer, coyotes, mice, and rodents may be encountered. Workers will use discretion and avoid all contact with animals. If these animals are interfering with site operations, or if dead animals are observed, the SSHO should be contacted immediately for assistance and advice.

Hanta virus Pulmonary Syndrome (HPS) is a disease that may be contracted when a person comes into contact with Hanta virus-infected rodents, their nesting materials, droppings, urine, or saliva. HPS may develop when virus particles are inhaled, absorbed through broken skin or the eyes, or when bitten by an infected animal. The majority of HPS cases have been reported in the Southwest, however, there is the potential for Hanta virus transmission in most regions with rodent populations. Risk to workers at the site is considered to be low; however, the severity of disease is high. Therefore, field personnel should be aware of the potential for exposure and should avoid coming into contact with rodents or their burrows or dens.

Rabies is an acute, infectious, often fatal viral disease transmitted to humans by the bite of warm-blooded infected animals. This disease affects the central nervous system of humans. A rabid animal may be recognized by signs of raging, uncontrollable movement and possible foaming near or at the mouth. The best control method is avoidance of animals that could be rabid. If bitten by a potentially rabid animal, contact the SSHO immediately. The animal in question must be capture or trap the animal so that it can be tested for rabies. The bitten individual shall seek medical attention immediately.

3.2.4.3 Poisonous Plants

Poison ivy, poison oak, and poison sumac are identified by three or five leaves radiating from a stem. Poison ivy is in the form of a vine while oak and sumac are bush-like. All of these plants can produce a delayed allergic reaction. The plant tissues have an oleoresin, which is active in live, dead, and dried parts. The oleoresin may be carried through smoke, dust, contaminated articles, and the hair of animals. Symptoms usually occur 24 to 48 hours after exposure resulting in rashes that itch and blister. Should exposure to any of these plants occur, wash the affected area with a mild soap and water within one-half hour, but do not scrub the area. The best preventative measure for poisonous plants is recognition and avoidance.

3.2.4.4 Snakes

The degree of toxicity resulting from snakebites depends on the potency of the venom, the amount of venom injected, and the size of the person bitten. Poisoning may occur from injection or absorption of venom through cuts or scratches. The most effective way to prevent snakebites is to avoid snakes in the first place. Personnel should avoid walking at night or in high grass and underbrush. Visual inspection of work areas should be performed prior to activities taking place. The use of leather boots and long pants will be required, since more than half of all bites are on the lower part of the leg. No attempts at killing snakes should be made; many people are bitten in such an attempt. Personnel shall not put their hands in areas where they cannot be seen.

3.2.4.5 Flying Insects

Flying insects such as mosquitoes, wasps, hornets, and bees may be encountered while project activities occur. Mosquito bites can be effectively prevented by the use of insect repellants containing DEET. Please note that there are some concerns with the use of DEET on skin and associated potential adverse health affects. Treatment for insect bites and bee stings can be effected by the use of commercially prepared ointments. Personnel who are allergic to bee stings shall notify the SSHO prior to working on the project.

3.2.4.6 Spiders

Personnel shall be alert to the potential for spider bites. Spiders sometimes establish residence in stored clothing and PPE. It is advisable for personnel to inspect clothing and PPE for spiders prior to donning. Immediate reporting and medical evaluation is necessary if personnel suspect being bitten by the Brown Recluse spider. If a spider bite is sustained, personnel shall report it to the SSHO.

3.3 Engineering Controls

The use of engineering controls for the protection of personnel is the first means of mitigation. This involves the elimination of hazards and the isolation of the workers from the hazards. Implementation of engineering controls can reduce the need for personal protective equipment by separating the worker from the contaminated material. During remedial activities dust and vapors may be generated. The Site Superintendent and SSHO will be constantly alert to the possibility of unacceptable dust and vapor levels.

Control measures will be implemented for all operations where dust is likely to be generated. Potential dust concentrations will be reduced primarily by careful planning and implementation of controls. There are a number of specific construction practices, which will reduce levels of airborne particulates. These include:

- Providing for a misting spray during excavation activities
- Applying water on and sweeping haul roads.
- Wetting and smashing equipment and building faces.
- Spraying mist on buckets during material handling and dumping.
- Hauling materials in properly tarped or watertight containers.
- Reducing the active work area surface and limiting the number of concurrent operations.
- Regular washing of contaminated equipment.

4.0 SAFETY AND HEALTH TRAINING

Consistent with OSHA's 29 CFR 1910.120 regulation covering Hazardous Waste Operations and Emergency Response, all Site personnel who will be performing remedial activities, intrusive sampling, emergency

response operations, or come in contact with contaminated material are required to be trained in accordance with the standard.

4.1 General Hazardous Waste Operation Training

Prior to arrival on-site, Conti will be responsible for certifying that the employees meet the requirements of preassignment training, consistent with OSHA 29 CFR 1910.120 paragraph (e)(3). Conti will provide documentation certifying that each general Site worker has received a minimum of 40 hours of instruction off site, and a minimum of three days actual field experience under the direct supervision of a trained, experienced supervisor. All personnel must also receive 8 hours of refresher training annually. At no time should anyone be working on-site without the minimum training requirements. Consistent with OSHA 29 CFR 1910.120 paragraph (e)(4), individuals designated as Site Supervisors require an additional 8 hours of training. A certificate of Worker/Visitor Acknowledgement will be completed and submitted for each site worker and visitor who will enter the contamination reduction zone, and/or exclusion zone.

4.2 Preparatory Meetings

Preparatory meetings will be conducted by the SSHO for site personnel prior to their initiating any new or differing site activities. At the Preparatory meetings, the SSHO will ensure that site personnel are knowledgeable of the SSHP and understand the hazards and controls of the activity to be performed (review Activity Hazard Analysis).

4.3 Site-Specific Training

All personnel working at the Site during remedial activities will review this SSHP with the SSHO. Personnel will sign an acknowledgment form to document their review and agreement to comply with the provisions of the SSHP. All visitors must sign the visitor's log and wait in the Conti field office for a briefing before entering the Site.

The SSHO will be responsible for training Site visitors in the hazard associated with the Site, to explain emergency procedures and instruct them in the use of protective gear required during the visit. Visitors meeting requirements of HAZWOPER may be allowed in the Exclusion Zone if conditions permit and if escorted by the SSHO.

4.3.1 Initial Session

Prior to commencement of onsite field activities, all site employees will attend a site-specific safety and health training session. This session will be conducted by the Site Safety and Health Officer to ensure that personnel are familiar with the requirements of this Site-Specific Safety and Health Plan. The initial session will consist of the contents of this SSHP and specific procedures developed for the project. The SSHO shall also provide initial site-specific training for replacement employees.

As a minimum the site-specific training will include:

- Explanation of the Overall Site HASP.
- Health and Safety Personnel and Organization.
- Special attention to signs and symptoms of overexposure to known and suspected site contaminants.
- Health effects of site contaminants.
- Air monitoring description.

- Physical hazards associated with the project.
- Selection, use, and limitations of available safety equipment and proper procedures for its use.
- Personal hygiene and decontamination.
- Respirator facepiece fit testing.
- PPE fitting to determine proper size for individuals.
- Site rules and regulations.
- Work zone establishment and markings.
- Site communication and the "Buddy System".
- Emergency preparedness procedures.
- Equipment decontamination.
- Medical monitoring procedures.
- Review applicable Conti Standard Operating Procedures.
- Site Specific Hazard Communication.
- Unexploded Ordnance Recognition and Safety Orientation

4.3.2 Periodic Sessions

Periodic training will be provided at least weekly and prior to each change of operation. The training shall address safety and health procedures, work practices, any changes to SSHP, review activity hazard analysis, work task or schedule, results of previous week's air monitoring, review of safety discrepancies and accidents.

4.4 Safety Meetings

A well-ordered flow of information is essential to a good safety program. Conti, through a program of safety meetings at all levels, intends to accomplish the goals of safety awareness, education, and participation.The SSHO shall conduct daily safety meetings with ALL on-site personnel. An opportunity shall be provided for employees to voice safety-related concerns. The SSHO will submit a synopsis of each meeting including topics covered, safety-related concerns, action items to be addressed, status of previous items and a signed attendance list.

4.5 Monthly Supervisor Safety Meeting

Monthly Supervisor Safety Meeting will be conducted by the SSHO to review past activities, incidents, lessons learned, plan for new or changed operations, review pertinent aspects of appropriate activity hazard analyses, establish safe working procedures for anticipated hazards, and provide pertinent safety and health training and motivation.

4.6 Hazard Communication Training

OSHA's standard for hazard communication requires that all workers be informed of potentially hazardous materials used in their work area. Conti provides employees with information and training on hazardous chemicals at their work site at the time of their initial assignment, annually, and whenever a new chemical is introduced into their work site that could present a potential hazard. Personnel are briefed on the general requirements of the OSHA hazard communication standard and duty-specific hazards by their immediate supervisor before they begin any duties on the work site. Personnel transferred from another site are also briefed on the duty-specific hazards by their immediate supervisor before they begin any duties on the work site.

4.7 Excavation/Trenching Competent Person

Supervisory and other essential personnel engaged in excavation activities are required to complete Competent Person Training. This training provides knowledge about soil analysis and classification, use of protective systems and the requirements of the OSHA Excavation Standard 29 CFR 1926.650 – 652, Subpart P.

4.8 First Aid/CPR Training

At least two site personnel will be required to complete first aid and cardiopulmonary resuscitation (CPR) training and receive the appropriate certification. CPR certification is renewed annually; first aid certification is renewed every three years. All first aid/CPR training is American Red Cross-approved or in accordance with OSHA standards. Additionally First Aid/CPR qualified personnel received bloodborne pathogen training as required by 29 CFR 1910.1030.

4.9 Unexploded Ordnance (UXO) Recognition and Safety

As part as the site-specific training, project personnel will receive Unexploded Ordnance Recognition and Safety training. Training will include a review of the Removal Action Report (Human Factors Application, Inc), UXO terms and definitions, Ordnance identification, and reporting and specific safety procedures.

5.0 MEDICAL SURVEILLANCE PROGRAM

The Medical Surveillance Program is designed to track the physical condition of employees on a regular basis as well as survey pre-employment or baseline conditions prior to potential exposures. The Medical Surveillance Program is a part of the overall Conti Safety and Health program.

5.1 Baseline Medical Monitoring

Each employee must receive a baseline physical, which can be part of an annual medical monitoring program, prior to being permitted to enter the Exclusion Zone or Contamination Reduction Zone. The content of the physical has been determined by Conti's Occupational Physician as suggested by NIOSH/OSHA/USCG/EPA's Occupational Safety & Health Guidance Manual for Hazardous Waste Site Activities. The minimum medical monitoring requirements for work at the Site is as follows:

- Complete medical and work histories
- Physical examination
- Pulmonary function tests (FVC and FEV1)
- Blood chemistry (CBC & SMAC 24)
- Urinalysis with microscopic examination.
- Audiometric Testing
- Eye examination and visual acuity
- Chest X-Ray (as directed by the Occupational Physician)
- Electrocardiogram (as directed by the Occupational Physician)
- Other Biological testing as prescribed by the Occupation Physician
- Serum Lead
- Zinc Protoporphyrin
- Polychlorinated Biphenyl
- In Vitro Monitoring (Bioassay), where applicable

The medical surveillance provided to the employee includes a judgment by the medical examiner of the ability of the employee to use either positive- or negative-pressure respiratory protection equipment. Any employee found to have a medical condition, which could directly or indirectly be aggravated by exposure to these site contaminants, or by the use of respiratory equipment, will not be employed for the project. A copy of the medical examination is provided at the employee's request.

The employees will be informed of any medical conditions that would result in work restriction or that would prevent them from working at hazardous waste sites. A certificate of Worker/Visitor Acknowledgement will be completed and submitted for each site worker and visitor who will enter the contamination reduction zone, and/or exclusion zone.

5.2 Periodic Monitoring

In addition to a baseline physical, all employees require a physical every 12 months unless the advising physician believes a shorter interval is appropriate. The Occupational Physician has prescribed an adequate medical evaluation, which fulfills OSHA 29 CFR 1910.120 requirements. The preassignment medical outlined above is applicable.

All personnel working on the Site that enter an active Exclusion or Contamination Reduction Zone will verify currency (within 12 months) with respect to medical monitoring. Conti will obtain a copy of the physician's written opinion detailing the employee's ability to perform hazardous waste site work.

At termination of employment or reassignment to an activity or location that does not represent a risk of exposure to hazardous substances, an employee may be required to take an exit physical. If his/her last physical was within the last 6 months, the advising medical consultant has the right to determine adequacy and necessity of an exit exam.

5.3 Exposure/Injury/Medical Support

As a follow-up to an injury or possible exposure above established exposure limits, all employees are entitled to and encouraged to seek medical attention and physical testing. Depending upon the type of exposure, it is critical to perform follow-up testing within 24-48 hours. It will be up to the occupation physician to advise the type of test required to accurately monitor for exposure effects.

Any employee, who develops a time loss illness exceeding one working day, or injury during the period of the contract, must be evaluated by the occupational physician. A written statement indicating the employee's fitness, signed by the occupational physician must be submitted prior to the employee entering the work site.

5.4 Medical Records

The results of medical testing and full medical records will be maintained in accordance with 29 CFR Part 1910.20. A copy of the medical certification will be kept on the Site for each person entering the Contamination Reduction Zone and Exclusion Zone.

6.0 PERSONAL PROTECTIVE EQUIPMENT (PPE)

This section provides an outline of the PPE and guidelines that will be implemented to minimize chemical, physical, and biological exposures and accidents during remedial activities. Where engineering controls and job hazard analyses do not eliminate all job hazards, employees will (where appropriate) wear PPE.

These include items such as, hard hats, face shields, safety goggles, glasses, hearing protection, foot guards, gloves etc. The SSHO will ensure that equipment selected will meet the following requirements:

- It will be appropriate for the particular hazard.
- It will be maintained in good condition.
- It will be properly stored when not in use, to prevent damage or loss.
- It will be kept clean, fully functional and sanitary.
- Must meet all applicable ANSI standards.

Personal clothing and jewelry can present additional safety hazards. Supervisors will ensure that workers wear appropriate clothing, which will not interfere with the PPE. All PPE will be selected in accordance with 29 CFR 1910.132. Conti will provide proper PPE to all employees. All protective clothing will be properly used, stored, selected, and maintained.

Government personnel will be supplied with all required personal protective equipment (excluding air-purifying negative-pressure respirators and safety shoes, which will be provided by the individual visitors). Conti will provide basic training in the use and limitations of PPE to government personnel.

6.1 PPE Hazard Assessment

Selection of the appropriate PPE is a complex process, which should take into consideration a variety of factors. Key factors involved in this process are identification of the hazards, or suspected hazards, routes of potential exposure to employees (inhalation, skin absorption, ingestion, and eye or skin contact); and the performance of the PPE materials (and clothing seams) in providing a barrier to these hazards. The amount of protection provided by PPE is material-hazard specific. That is, protective equipment materials will protect well against some hazardous substances and poorly, or not at all, against others. In many instances, protective equipment materials cannot be found which will provide continuous protection from the particular hazardous substance. In these cases, the breakthrough time of the protective material should exceed the work duration.

Other factors in this selection process to be considered are matching the PPE to the employee's work requirements and task-specific conditions. The durability of PPE materials, such as tear strength and seam strength, should be considered in relation to the employee's tasks. The effects of PPE in relation to heat stress and task duration are a factor in selecting and using PPE. In some cases layers of PPE may be necessary to provide sufficient protection, or to protect expensive PPE inner garments, suits or equipment.

The following are guidelines, which Conti Environmental uses to select PPE. Based on the site characterization and analysis performed during the remedial activities, a combination of PPE has been selected from the different protection levels (i.e., A, B, C, D Modified or D) as being suitable to the hazards of the work to be performed. Section 3.0 of this plan characterizes and analyzes, the chemical and physical hazards, specific tasks/operations, routes of exposure, and concentrations of contaminants. Characteristics, capabilities and limitations are summarized in this section.

- **Level A:** The highest level of skin, eye, and respiratory protection (Level A PPE is not anticipated on this project).

- **Level B:** Should be worn when the highest level of respiratory protection is needed, but a lower level of skin protection is needed, compared to that of level A (Level B PPE is not anticipated on this project).
- **Level C:** Should be worn when the criteria for using air-purifying respirators are met, and a lesser or the same level of skin protection is needed, compared to that of level B.
- **Level D Modified:** Should be worn when respiratory protection is not warranted but minimal dermal protection is necessary.
- **Level D:** Level D provides minimal protection against chemical hazards. A work uniform consisting of coveralls and/or long pants and sleeves may be worn in any area without the potential for significant respiratory or skin contact hazards.

Personal Protective Equipment alone should not be relied on to provide protection against hazards, but should be used in conjunction with guards, engineering controls, and sound work practices.

6.1.1 Head Protection

All personnel shall wear a hard hat that meets the requirements and specifications in ANSI Safety Requirements for Industrial Head Protection Z89.1-1969. Exceptions to this requirement are personnel in the site office and rest and eating areas.

6.1.2 Hand Protection

Outer gloves used on the Site for remedial activities shall be either chemical resistant or general purpose. The appropriate glove shall be determined by the SSHO for a specific work task. Chemical resistant gloves shall be selected using appropriate chemical degradation guides. Cotton work gloves will be worn when work activities require the handling of sharp and rough-surfaced objects.

Welder's gloves or any other special type of gloves are considered outer gloves and are to be worn over inner gloves. These special outer gloves shall be stored on-site and shall be disposed of properly as PPE waste. Inner gloves shall always be chemical resistant, shall be selected using appropriate chemical degradation guides and shall be disposed of as PPE waste.

6.1.3 Eye/Face Protection

No contact lenses are allowed in the Exclusion Zone (EZ) and Contamination Reduction Zone (CRZ). Eye/Face protection shall be worn by all personnel in the CRZ and EZ. Double eye protection will be required when power-washing equipment during decontamination. All eye/face protection provided shall be ANSI Z87-1989 approved.

6.1.4 Footwear

Footwear will be steel-toed safety boots. Chemical-resistant outer boot covers are to be worn in the Exclusion Zone, Contamination Reduction Zone. Boot racks will be provided in the CRZ for drying of outer boots.

6.1.6 Respiratory Protection

To control and or minimize the threat of occupational diseases caused by breathing air contaminated with harmful dusts, fogs, fumes, mists, gases, smokes, sprays, or vapors, the primary objective of this program shall be to prevent atmospheric contamination. This shall be accomplished as far as feasible by accepted engineering control measures (for example, dust suppression). When effective engineering controls are not feasible, or while they are

being instituted, appropriate respiratory protection shall be used. A respiratory protection program will be implemented that is compliant to the requirements of 29 CFR 1910.134 "Respiratory Protection." Respiratory protection equipment shall be NIOSH-approved and respirator use will conform to American National Standards Institute (ANSI) Z88.2.

Respirators shall be provided when such equipment is necessary to protect the health of the employee. Conti shall:

- Provide the respirators to Conti personnel, which are applicable and suitable for the purpose intended.
- Be responsible for the maintaining a written Respiratory Protective Program, in accordance with 29 CFR 1910.134 The employee shall use the provided respiratory protection in accordance with instructions and training received.
- Respirators shall be selected on the basis of hazards to which the worker is exposed.
- The user shall be instructed and trained in the proper use of respirators and their limitations.
- Respirators shall be regularly cleaned and disinfected.
- Respirators shall be stored in a convenient, clean, and sanitary location.
- Respirators used routinely shall be inspected during cleaning. Worn or deteriorated parts shall be replaced. Respirators for emergency use, such as self-contained devices, shall be thoroughly inspected at least once a month and after each use.
- Appropriate surveillance of work area conditions and degree of employee exposure or stress shall be maintained.
- There shall be regular inspections and evaluations to determine the continued effectiveness of the program.
- Employees will not be assigned to tasks requiring use of respirators unless it has been determined that they are physically able to perform the work and use the equipment. A physician shall determine whether an individual is physically fit to wear a respirator. The physician's clearance allows the worker to don a respirator and work in conditions of high ambient temperatures. Heat stress will be closely monitored by the SSHO.

Each respirator shall be individually assigned and not interchanged between workers without cleaning and sanitizing. The cartridges/filters shall be changed at the first sign of breakthrough based on contaminant warning properties or if the user experiences excessive breathing resistance. The SSHO will make final determination of the frequency of respirator cartridge/filter change-out. Respirators shall be cleaned and stored in an uncontaminated atmosphere after each use. Used cartridges will be disposed of with spent PPE. Self-contained breathing apparatus/supplied-air respirators shall be inspected before and after use and at least once monthly, if in storage for emergency use.

All employees working at the Site during remedial activities who have the potential of wearing a respirator shall be fit-tested to ensure they utilize the proper size respirator. Conti shall arrange for fit testing. Sub-contractors will provide the SSHO with fit-test documentation. The fit test is conducted according to the manufacturer's suggestions. The test shall consist of a taste and odorous vapor qualitative test. As per OSHA regulations, personnel that are unable to pass a fit test shall not enter a work area when respiratory protection is required. In addition, facial hair is prohibited from the respirator seal area. Any person with facial hair will not be permitted to enter a work area where respiratory protection is required, regardless of the fit test results. Documentation of the fit testing will be maintained on-site.

6.2 Levels of Protection

The level of protection must correspond to the level of hazards known or suspected for the specific work activity.

6.2.1 Level B

Level B equipment, used as appropriate, is as follows:

- Positive pressure, full facepiece self-contained breathing apparatus (SCBA) or positive pressure supplied air respirator with escape SCBA (NIOSH-approved)
- Disposable coverall (Tyvek, Polycoated Tyvek or Saranex)
- Outer gloves: neoprene or nitrile
- Inner gloves: latex or nitrile
- Chemical resistant or disposable overboots.
- Steel-toed safety boots
- Hard hat

6.2.2 Level C

Level C equipment, used as appropriate, is as follows:

- Full-face, air purifying, cartridge-equipped respirators (NIOSH-approved) utilizing Organic Vapor/Acid Gas and HEPA filters (half-face if approved by SSHO). Cartridges and/or filters must be replaced as needed and, as a minimum, changed weekly.
- Disposable coverall (Tyvek, Polycoated Tyvek or Saranex).
- Outer gloves: leather, cotton, neoprene or nitrile
- Inner gloves: latex or nitrile
- Chemical resistant or disposable overboots
- Steel-toed safety boots
- Hard hat
- Safety glasses (if half-mask is utilized)
- Splash guards (worn during high pressure washing activities)

6.2.3 Modified Level D

Modified Level D equipment, used as appropriate, is as follows:

- Regular Tyvek coveralls (Polycoated Tyvek as required)
- Outer gloves: leather, cotton, neoprene or nitrile
- Inner gloves: latex or nitrile (doubled)
- Chemical resistant or disposable overboots
- Steel-toed safety boots
- Hard hat
- Safety glasses
- Splash guards (worn during high pressure washing activities)

6.2.4 Level D

Level D equipment, used as appropriate, is as follows:

- Work uniform (Long pants and Shirt)
- Hard hat
- Steel-toed safety boots (with disposable overboots, as required)

- Safety glasses
- Leather or heavy cloth gloves (as needed)

6.3 Initial Levels of Protection

Based upon the nature of the remedial activities to be performed at the Site, the initial levels of protection to be used are outlined in ***Table 6, "Initial Levels of Protection"***. This table lists each work task and the initial level of protection. The initial level of protection is defined as that level in which work commences.

Table 6 - Initial Levels of Protection

Task	CPC	Level of PPE
Site Preparation/Mobilization	None	Level D
Erosion and Sediment	Reg. Tyvek	Level D/Level D Modified
Clearing	Reg. Tyvek	Level D/Level D Modified
Site Surveying	None	Level D
Topsoil Stripping and Stockpiling	Reg. Tyvek	Level D/Level D Modified
Site Grading (Cut/Fills)	Reg. Tyvek	Level D/Level D Modified
Installation of Cover Fill	None	Level D
Equipment Decontamination	Reg. Tyvek	Level D Modified
Monitoring Well Decommissioning	Reg. Tyvek	Level D Modified
Site Restoration/Demobilization	None	Level D

Once the need for PPE is established, a careful evaluation of the hazards is necessary so that a selection can be made that minimizes the risk to the user. For chemical situations, knowing the hazard includes being aware of: the type of chemical, the physical state (liquid, solid or gas), and the physiological effect (toxic, corrosive, etc.). Knowing the level of exposure is also important when selecting protective clothing and equipment. After the appropriate level of PPE has been determined, the choice of Chemical Protective Clothing (CPC) material must be considered. Among the most important factor in selecting the appropriate CPC is chemical resistance. ***Table 6, "Initial Level of Protection"*** identifies the CPC as they relate to each task.

Air monitoring using direct-reading instruments and personal air sampling will be performed to determine if an upgrade or downgrade from initial PPE levels is warranted. All decisions on the level of protection will be based upon a conservative interpretation by the SSHO of the information provided by air monitoring results, environmental results and other appropriate information.

7.0 AIR MONITORING PLAN

The air-monitoring plan will serve to outline procedures to identify and quantify airborne chemical contaminants during remedial activities at Landfill 5. Both real-time monitoring and air sampling will be conducted throughout the duration of the project to establish the maximum levels of personal protection required, as well as to verify that worker exposure levels and respiratory protection are adequate. Available site information indicates that the primary concerns with respect to contamination at the site are related to inhalation of petroleum hydrocarbon and direct contact with dust/particulates generated during contaminated material handling. As a result, engineering controls will be utilized to the maximum extent possible to control the production of dust/particulates during the project. Engineering controls may include the use of tarps or coverings, water misting or dust control additives. Air monitoring will be performed by the [illegible]. Data will be reviewed by the Safety and Health Manager with consultation of the CIH, if needed.

7.1 Real-Time Air Monitoring

7.1.1 Organic Vapor Monitoring

During the remedial activities, organic vapor levels will be monitored during intrusive activities with a PID set at the appropriate span setting and equipped with an 10.2 eV probe or equivalent device (a copy of the PID Operator's Manual will be kept on-site). Real-time air monitoring equipment calibration will be performed in accordance with the manufacturer's recommendation prior to field use. Calibration information will be recorded on the Daily Air Monitoring Report. Maintenance and calibration procedures for all air monitoring devices will be maintained on site.

7.1.2 Combustible Gases/Carbon Monoxide/Oxygen Levels/Hydrogen Sulfide

A Gastech or MSA Portable Gas Monitor will be utilized to monitor for explosive and oxygen enriched/deficient atmospheres and concentrations of hydrogen sulfide during intrusive operations. A copy of the Operator's Manual will be kept on-site. The Portable Gas Monitor also will be utilized for all intrusive activities and activities where the potential for disruption of utilities exists. Calibration information will be recorded on the Daily Air Monitoring Report. Maintenance and calibration procedures for all air monitoring devices will be maintained on site.

7.1.3 Particulate Monitoring

Particulate (Real-time) air monitoring will be performed, , on a continuous basis, using a MIE Personal/Data RAM Particulate Monitor (RAM). A copy of the appropriate Operator's Manual will be kept on-site. Air monitoring results will be recorded on the Daily Air Monitoring Report.

SHSO and the superintendent will be constantly alert to the possibility of unacceptable dust levels being generated by remedial activities. Unacceptably high levels of airborne particulate, or excessive dust conditions, will trigger dust control measures. Should dust control measures prove ineffective and unacceptable levels of particulate are present for a sustained period, the SHSO may suspend work activities pending further evaluation of the situation.

7.1.4 Equipment Calibration

Real-time air monitoring equipment calibration will be performed in accordance with the manufacturer's recommendation prior to field use. Calibration information will be recorded on the Daily Air Monitoring Report. Maintenance and calibration procedures for all air monitoring devices will be maintained on site.

7.2 Operational Action Levels

A decision-making protocol for an upgrade in levels of protection and/or withdrawal of personnel from an area based on atmospheric hazards is outlined in ***Table 7 – "Operational Action Levels".***

7.3 Personal Air Sampling

In addition to the real-time monitoring performed during material handling activities, a personal air-monitoring program will provide for the determination of worker's airborne exposure levels. Such a determination will be made from laboratory analysis of air samples collected from workers during

work shift. The selection of the worker to be monitored for daily exposure will be done by the SSHO based on his professional judgment of the characteristics of the job and locations in each work area. Personal sampling will be conducted in a manner representative of exposure of workers at those locations or jobs where the potential for maximum exposure is predicted. Personal air monitoring results will be used to verify personnel exposure during the remedial project. Samples will be collected from representative workers during material handling activities. Refer to ***Table 8 – "Proposed Site Air Monitoring"***

Table 7 – Operational Action Levels

Contaminants	Action Level	Action to Take
Volatile Organic Compounds	1 To 10 PPM Above Background At The Breathing Zone And Sustained For 1 Minute	Level D, Continuous Air Monitoring Quantify with Colorimetric Tubes.
	10 To 100 PPM Above Background At The Breathing Zone And Sustained For 1 Minute	Upgrade To Level C, Continuous Air Monitoring
	100 To 300 PPM Above Background At The Breathing Zone And Sustained For 1 Minute	Upgrade To Level B, Continuous Air Monitoring
	> 300 PPM Above Back Ground At The Breathing Zone And Sustained For 1 Minute	Stop Work, Evacuate Work Zone And Evaluate with Continuous Air Monitoring
Combustible Gas In Air	Less Than 10% LEL	Continue With Caution And Air Monitoring
	Greater Than 10% LEL	Stop Work, Immediate Withdrawal Of Personnel, and investigate
Oxygen In Air	Less Than 19.5%	Stop Work &Ventilate Or Upgrade To Level B
	19.5 To 23.5%	Level D, Continue Work With Air Monitoring
	Greater Than 23.5%	Stop Work, Immediate Withdrawal Personnel And Evaluate
Particulate in Air	0 to 100 ug/m^3	Level D No Action Taken
	100 ug/m^3 to 150 ug/m^3	Level D Initiate Dust Control
	2.5 mg/m^3 to 5 mg/m^3	Upgrade To Level C, Air Monitoring And Initiate Dust Control
	Greater than 5 mg/m^3	Stop Work and Investigate

Table 8 - Proposed Site Air Sampling

Contaminant	Task/Activity	Sampling Type and Method	Analysis Method
PAH Screen	Material Handling Activities	BZ- Personal	NIOSH 5506
Total Dust	Material Handling Activities	BZ- Personal	NIOSH 0500
PCB (Aroclor-1254)	Material Handling Activities	BZ- Personal	[illegible]

The SSHO will designate two-crew members in an active work area to wear the sampling device. In general, samples will be collected from those workers and site conditions representing the highest potential for exposure. Initially, two workers will be monitored the first day of each activity at the site. If sampling results are above the Action Levels additional personal sampling will be performed.

7.4 Perimeter Air Monitoring

Perimeter air monitoring will be performed to ensure that remedial activities do not result in excessive airborne particulate emissions from the site. Real-time particulate monitoring will be collected to determine the concentrations of particulate at the perimeter of the work area.

Continuous real-time perimeter air monitoring for total particulate will be performed during material handling activities. The SSHO will select one downwind and one upwind air monitoring station at the start of each workday. Wind conditions will be monitored by the SSHO throughout the day and the location of the stations adjusted accordingly. Particulate monitoring will be performed using an MIE DataRam DR-2000 or equivalent (real-time air monitor). The particulate monitors will be fitted with a PM_{10} inlet and equipped with an alarm set at the action level 100 microgram per cubic meter. Measurements will be integrated over a period of 15 minutes for comparison with the pre established action level.

When an alarm is triggered, the SSHO will inform the Project Superintendent and visually verify the readings and monitor the unit to determine if the reading is sustained. Upon verification of a continual, sustained reading exceeding the action level, the SSHO, and Project Superintendent will evaluate the on-going activities to determine what mitigative actions are required. Should the sustained readings continue, operations will cease.

All of the real-time monitors will be equipped with dataloggers, which will continually record the readings throughout the course of the day's activities. Stored information includes time and date, average concentrations, maximum and minimum values over selected periods, STEL concentration, and tagging codes. These dataloggers will be downloaded at the end of the workday and reviewed by the Site Safety and Health Officer. The air monitoring report will be attached to the Daily Safety and Inspection Log and submitted daily to the Contracting Officer representative.

8.0 SAFETY PROCEDURES AND WORK PRACTICES

8.1 Emergency Phone Numbers, OSHA Posters, Hazards Warnings

(Reference Conti SOP 23, *Site Specific Health and Safety Requirement*)

Emergency telephone numbers and Route to the Area Hospital will be clearly posted and easily visible at all times. There should be OSHA posters prominently displayed and warning signs posted for any known or potential hazard(s) present. Material Safety Data Sheets (MSDS) must be available on the job site at all times.

8.2 First Aid Kits

(Reference Conti SOP 23, Medical and First Aid Equipment Requirements)

First-aid kits/stations and required contents are maintained in a serviceable condition. Unit-type kits have all items in the first-aid kit individually wrapped, sealed, and packaged in comparable sized packages. First-aid stations shall be located as close as practicable to the highest concentration of personnel. First-aid stations shall be well-marked and available to personnel during all working hours. First-aid stations shall be equipped with a

first-aid kit, the size of which shall be dependent upon the number of personnel normally employed at the work site.

8.3 Personal Protective Equipment Clothing

(Reference Conti SOP 31, Personal Protective Equipment Procedures)

Where there is a danger of flying particles or corrosive materials, employees must wear protective goggles and/or face shields. Employees are required to wear safety glasses at all times in all non-office areas. Employees who need corrective lenses are required to wear only approved safety glasses, protective goggles, or other medically approved precautionary procedures when working in areas with harmful exposures, or risk of eye injury. Employees are required to wear protective gloves, aprons, shields and other means provided in areas where they may be subject to cuts, corrosive liquids and/or harmful chemicals. Hard hats must be worn in areas subject to falling objects, and at all times while at construction sites. Appropriate footwear including steel-toed shoes must be worn in an area where there is any risk of foot injuries from hot, corrosive, poisonous substances, falling objects, and crushing or penetrating action. When necessary, employees must use the approved respirators, which are provided for regular and emergency use. All safety equipment must be maintained in sanitary condition and ready for use. Report any defective equipment immediately. Food may not be eaten in work areas, or in places where there is any danger of exposure to toxic materials or other health hazards. In cases of cleaning toxic or hazardous materials, protective clothing provided must be worn.

8.4 Combustible Materials

(Reference Conti SOP 21, Fire Prevention and Protection Procedures)

All combustible scrap, debris and waste materials (oily rags, etc.) must be stored in covered metal receptacles and removed from the work site promptly. Proper storage to minimize the risk of fire, including spontaneous combustion must be practiced. Only approved containers are to be used for the storage and handling of flammable and combustible liquids. All connections on drums and combustible liquid piping, vapor and liquid must be kept tight. All flammable liquids should be kept in closed containers when not in use (e.g., parts-cleaning tanks, pans, etc.). Liquefied petroleum gas must be stored, handled, and used in accordance with safe practices and standards. No smoking signs must be posted. All solvent wastes and flammable liquids should be kept in covered containers until they are removed from the work site. Fuel gas cylinders and oxygen cylinders must be separated by distance, fire resistant barriers, etc., while in storage. Fire extinguishers will be 10 lb. ABC and placed in areas where they are to be used. Fire extinguishers must be located within 75 ft. of outside areas containing flammable liquids, and within 10 ft. of any inside storage area for such materials. "NO SMOKING" rules will be enforced in areas involving storage and use of hazardous materials. "NO SMOKING" signs have been posted where appropriate in areas where flammable or combustible materials are used and/or stored. Safety cans must be used for dispensing flammable or combustible liquids at point of use. All spills of flammable or combustible liquids must be reported and cleaned up promptly.

8.5 Hazardous Substances

(Reference Conti SOP 41, Hazard Communication Program)

When hazardous substances are used in the workplace, the hazard communication program dealing with Material Safety Data Sheets (MSDS), labeling and employee training will be in operation. MSDS materials will be readily available for each hazardous substance used. A training program plus regular question and answer sessions on dealing with hazardous materials will be given to keep employees informed. The program will include an explanation of what an MSDS is and how to use and obtain one; MSDS contents for each hazardous substance or class of substances; explanation of the "Right to Know"; identification of where employees can see the employer's written hazard communication program and where hazardous substances are present in their work area; the health hazards of substances in the work area, how to detect their presence, and

specific protective measures to be used; as well as informing them of hazards of non-routine tasks and unlabeled pipes.

8.6 Work Areas

(Reference Conti SOP 23, Site Specific Health and Safety Requirement)

Work sites must be clean and orderly. Spills must be reported and cleaned up immediately. All combustible scrap, debris and waste must be stored safely and removed promptly. Waste containers must be covered. Oily and paint soaked rags are combustible and should be discarded in sealable metal containers only. Make sure all pits and floor openings are either covered or otherwise guarded. Fire extinguishers must remain accessible at all times. Work sites shall be kept free of debris, floor storage and electrical cords.

8.7 General Fire Safety

(Reference Conti SOP 21, Fire Prevention and Protection Procedures)

Portable fire extinguishers are provided in adequate number and type (10 lb. ABC) and are located throughout the site. Fire extinguishers are located in readily accessible locations. Fire extinguishers are recharged regularly and the date of last inspection noted on their tags. Extinguishers should be placed free from obstructions or blockage. All extinguishers must be fully charged and in their designated places unless in use. All employees are periodically instructed in the use of extinguishers and fire protection procedures. Fire Extinguishers will be located in the following areas:

- ***Support Zone (Field):*** (1) 10 lb ABC multipurpose dry chemical type fire extinguishers.
- ***Decontamination Reduction Zone:*** (2) 10 lb ABC multipurpose dry chemical type fire extinguishers.
- ***Exclusion Zone:*** (1) 10 lb ABC multipurpose dry chemical type fire extinguishers.
- ***Equipment:*** All of Conti's heavy equipment are supplied with ABC multipurpose dry chemical type fire extinguishers. ABC type fire extinguishers can also be found in all vehicles.

8.8 Fueling

(Reference Conti SOP 21, Fire Prevention and Protection Procedures)

Where flammable liquids are used, employees will be trained to deal with spillage during fueling operations, clean-up methods, the types and designs of fueling hoses and the specific types of fuel it can handle, whether fueling is being done with a nozzle that is a gravity flow system or self-closing, how to avoid spills and recognition that if a spill does occur, the safety of restarting an engine. Employees must be aware that an open flame or light near any fuel is prohibited when fueling or the transfer of fuel is occurring. "NO SMOKING" signs will be posted conspicuously. Vehicles/Equipment will be turned off during fueling.

8.9 Powder Actuated Tools

(Reference Conti SOP 25,Hand and Power Tools Operating Procedures)

The employees using powder-actuated tools must be properly trained. All powder-actuated tools must be left unloaded until they are actually ready to be used. Each day before using, each powder-actuated tool must be inspected for obstructions or defects. The powder-actuated tool operators must have and must use appropriate personal protective equipment such as hard hats, safety goggles, safety shoes and ear protectors whenever they are using the machines. While not anticipated power actuated tools may be used during remedial activities at landfill 5.

8.10 Confined Spaces

(Reference Conti SOP 15, Confined Space Entry Procedures)

Before entry into a confined space, all moving equipment contained in the confined space must be locked-out. Ventilation must be either natural or mechanically provided into the confined space. All confined spaces that contain inert, toxic, flammable or corrosive materials must be valved off, blanked, disconnected and separated. Atmospheric tests must be performed to check for oxygen content, toxicity and explosive concentration. Atmospheric tests must be performed on a regular basis in a confined area where entry is required. When personnel enter a confined area, assigned safety standby employees who are alert to the work being done, are able to sound an alarm if necessary and to render assistance. These standby employees must be trained to assist in handling lifelines, respiratory equipment, CPR, first aid, and be able to employ rescue equipment that will remove the individual from the confined area. Entrants, Attendant, Supervisors and rescuers involved in confined space activities will have the required training in accordance with OSHA regulations and the documentation will be available onsite. Confine space entry is not anticipated during remedial activities at Landfill 5.

8.11 Excavation/Trenching

(Reference Conti SOP 37, Trenching and Excavation Procedure)

Prior to excavation/trenching operations, all underground installations in the area shall be identified, located and marked so that when the approximate location of the utility is reached, the exact location can be determined. Employees shall not enter excavations/trenches deeper than 5 feet unless the excavation has been sloped or shored. Excavated spoils must be placed at least 2 ft back from the edge of excavations. The degree of sloping is dependent on the type of soil and the depth of excavation. Excavation work must always be under the immediate supervision of a competent person with authority and qualifications to modify the shoring system or work methods as necessary to provide greater safety. A ladder projecting 36 in. above ground surface must be provided for access and exit. Travel distance to the ladder must not exceed 25 ft. Excavation/trenches regardless of the depth or width shall be barricaded or covered. The use of raised berms, caution signs and caution tape will be used to protect both the public and other personnel on the site.

8.12 Machine Guarding

All equipment and machinery should be securely placed, and anchored when necessary, to prevent tipping or other movement that could result in personal injury. Electrical power to each machine shall be capable of being locked out for maintenance, repair or security. All manually operated valves and switches controlling the operation of equipment and machines must be clearly identified and readily accessible. All moving chains and gears must be properly guarded. The supervisor will instruct every employee in the work area on the methods provided to protect the operator and other employees in the machine area from hazards created by the operation of a machine, such as nip points, rotating parts, flying chips and sparks. The machinery guards must be secured and arranged so they do not present a hazard. All radial arm saws must be arranged so that the cutting head will gently return to the back of the table when released.

8.13 Lockout/Tagout Procedures

(Reference Conti SOP 28, Lockout/Tagout (Hazardous Energy) Procedures)

All machinery or equipment capable of movement must be de-energized or disengaged and blocked or locked out during cleaning, servicing, adjusting or setting up operations, whenever required. The lockout procedure requires that stored energy (i.e. mechanical, hydraulic, air) be released or blocked before equipment is locked out for repairs. Appropriate employees are provided with individually keyed personal safety locks. Employees

are required to keep personal control of their key(s) while they have safety locks in use. Employees must check the safety of the lockout by attempting a start up after making sure no one is exposed. Where the power disconnector does not also disconnect the electrical control circuit, the appropriate electrical enclosures must be identified. The control circuit can also be disconnected and locked out.

Temporary Electrical service installation and will be performed by a qualified electrician, work may only be performed on de-energized equipment. Lockout/Tagout procedures will be implemented to assure the safety of personnel during electrical work activities.

8.14 Electrical

(Reference Conti SOP 40, Electrical Procedures)

Equipment such as electrical tools or appliance must be grounded or of the double insulated type. Extension cords being used must have a grounding conductor. If ground-fault circuit interrupters are installed on each temporary AC circuit at locations where construction, or excavations are being performed, temporary circuits must be protected by suitable disconnecting switches or plug connectors with permanent wiring at the junction. Personnel must be aware of the following: Exposed wiring and cords with frayed or deteriorated insulation must be repaired or replaced. Flexible cords and cables must be free of splices or taps. Clamps or other securing means must be provided on flexible cords or cables at plugs, receptacles, tools, and equipment. The cord jacket must be held securely in place. All cord, cable and raceway connections must be intact and secure. In wet or damp locations, electrical tools and equipment must be appropriate for the use or location, or otherwise protected.

A significant hazard on construction jobsites is the accidental contact of moving equipment with live overhead power distribution and service lines. Where work must be done near live lines, the movement of all equipment such as cranes, excavators and other equipment must be guided by an observer who can observe the clearance of the equipment from energized lines and give timely warning to equipment operators. The minimum clearance between live lines and any jobsite equipment is 10 ft (3.0 m), and the clearance increases with increasing line voltages.

Underground electric lines shall be located and clearly marked. These utilities will be protected, removed or relocated as needed to do the work safely. The excavation work shall not be allowed to endanger the underground utility or the people doing the work. Barricades, shoring, or other supports as needed shall protect utilities left in place that are exposed by the excavation

8.15 Material Handling

(Reference Conti SOP 29, Material Handling, Storage, Use & Disposal Procedures)
(Reference Conti SOP 19 Drum handling Procedures)

In the handling of materials, employees must know the following: There must be safe clearance for equipment through aisles and doorways. Vehicles must be shut off and brakes must be set prior to loading or unloading. Containers of combustibles or flammable, when stacked while being moved, must be separated by dunnage sufficient to provide stability. Trucks and trailers will be secured from movement during loading and unloading operations. Hand trucks must be maintained in safe operating condition. Chutes must be equipped with sideboards of sufficient height to prevent the handled materials from falling off. At the delivery end of rollers or chutes, provisions must be made to brake the movement of the handled materials. Hooks with safety latches or other arrangements will be used when hoisting materials, so that slings or load attachments won't accidentally slip off the hoist hooks. Securing chains, ropes, chokers or slings must be adequate for the job to be performed. When hoisting material or equipment, provisions must be made to assure no one will be passing under the suspended loads.

8.16 Industrial Trucks/Forklifts

(Reference Conti SOP 30, Motor Vehicles and Mechanized Equipment)

When operating any industrial truck, substantial overhead protective equipment will be provided on high lift rider equipment. Each industrial truck must have a warning horn, or other device which can be clearly heard above the normal noise in the area where operated. Before using a forklift, check that the brakes on each industrial truck are capable of bringing the vehicle to a complete and safe stop when fully loaded. The parking brake must effectively prevent the vehicle from moving when unattended. Personnel operating forklifts will have the required training in accordance with OSHA regulations and the documentation will be available onsite.

8.17 Driving

(Reference Conti SOP 30, Motor Vehicles and Mechanized Equipment)

Drive safely. If vehicles are used during the workday, seat belts are to be worn at all times. Vehicles must be locked when unattended to avoid criminal misconduct. Do not exceed the speed limit. Vehicles must be parked in legal spaces and must not obstruct traffic. Defensive driving must be practiced by all employees. Employees should park their vehicles in well-lighted areas at/or near entrances to avoid criminal misconduct.

8.18 Portable Power Tools

(Reference Conti SOP 25, Hand and Power Tool Operating Procedures)

Portable power tools pose a special danger to employees because they are deceptively small and light, yet they can do great bodily harm if used improperly or poorly maintained. These rules apply to all power tools, but are especially important when handling portable saws, drills and power screwdrivers. Check your equipment before you use it. All grinders, saws and similar equipment should be equipped with appropriate safety guards. Power tools should not be used without the correct shield, guard, or attachment, recommended by the manufacturer. Portable circular saws must be equipped with guards above and below the base shoe. Circular saw guards should be checked periodically and before each use to assure they are not wedged up, thus leaving the lower portion of the blade unguarded. All rotating or moving parts of equipment should be guarded to prevent physical contact. All cord-connected, electrically operated tools and equipment should be effectively grounded or of the approved double insulated type. Effective guards must be in place over belts, pulleys, chains, sprockets, on equipment such as concrete mixers, air compressors, etc. If portable fans are provided, they must be equipped with full guards or screens having openings 1/2 inch or less. Do not attempt to lift heavy objects without proper equipment. Hoisting equipment will be made available for lifting heavy objects, with hoist ratings and characteristics appropriate for the task. Power tools are either battery operated or wired. If battery operated, don't under-estimate their power. A small electric drill or power screwdriver can cause a severe injury if it lands in the wrong place. Typically used with extension cords, the more powerful hard-wired equipment presents a double safety problem: the actual equipment plus its electrical power source. Ground-fault circuit interrupters must be provided on all temporary electrical 15 and 20-ampere circuits used during periods of construction. Pneumatic and hydraulic hoses on power-operated tools should be checked regularly for deterioration or damage.

8.19 Tool Maintenance

(Reference Conti SOP 25, Hand and Power Tool Operating Procedures)

Faulty or improperly used hand tools are a safety hazard. All employees shall be responsible for examining their tools and equipment (both company and employee-owned) used by them or other employees at their workplace to see are in good condition. Hand tools such as chisels, punches, etc., which develop mushroom heads during use,

must be reconditioned or replaced as necessary. Broken or fractured handles on hammers, axes and similar equipment must be replaced promptly. Worn or bent wrenches should be replaced regularly. Appropriate handles must be used on files and similar tools. Check your tools often for wear or defect. Jacks must be checked periodically to assure they are in good operating condition. Tool handles must be wedged tightly into the heads of tools. Tool cutting edges should be kept sharp enough so the tool will move smoothly without binding or skipping. When not in use, tools should be stored in a dry, secure location.

8.20 Compressed Gas & Cylinders

(Reference Conti SOP14, Compressed Gas Cylinder(Welding and Cutting) Procedures)

Cylinders must be legibly marked to identify clearly the gas contained. Compressed gas cylinders should be stored only in areas, which are protected from external heat sources such as flame impingement, intense radiant heat, electric arcs or high temperature lines. Cylinders must be stored or transported in a manner to prevent them from creating a hazard by tipping, falling or rolling. Valve protectors must always be placed on cylinders when the cylinders are not in use or connected for use. All valves must be closed off before a cylinder is moved, when the cylinder is empty, and at the completion of each job.

8.21 Welding and Cutting

(Reference Conti SOP14, Compressed Gas Cylinder (Welding and Cutting) Procedures)
(Reference Conti SOP 21, Fire Prevention and Protection Procedures)

Compressed gas cylinders should be regularly examined for obvious signs of defects, deep rusting, or leakage. Use care in handling and storing cylinders, safety valves, relief valves and the like, to prevent damage. Precaution must be taken to prevent mixture of air or oxygen with flammable gases, except at a burner or in a standard torch. Only approved apparatus (torches, regulators, pressure-reducing valves, acetylene generators, manifolds) may be used. Cylinders must be kept away from sources of heat. It is prohibited to use cylinders as rollers or supports. Cylinders, cylinder valves, couplings, regulators, hoses and apparatus must be kept free of oily or greasy substances. Care must be taken not to drop or strike cylinders. Unless secured on special trucks, all regulators must be removed and valve-protection caps put in place before moving cylinders. Before a regulator is removed, the valve must be closed and gas released from the regulator.

The open circuit (No Load) voltage of arc welding and cutting machines must be as low as possible and not in excess of the recommended limits. Under wet conditions, automatic controls for reducing no-load voltage must be used. Grounding of the machine frame and safety ground connections of portable machines must be checked periodically. Electrodes must be removed from the holders when not in use. All electric power to the welder must be shut off when no one is in attendance. Suitable fire extinguishing equipment must be available for immediate use before starting to ignite the welding torch. All connecting cable lengths must have adequate insulation. When the object to be welded cannot be moved and fire hazards cannot be removed, shields must be used to confine heat, sparks and slag.

The Hot Work Permit Procedures will be followed, as required. Fire watchers will be assigned when welding or cutting is performed in locations where a serious fire might develop. All combustible floors must be kept wet, or protected by fire-resistant shields. When floors are wet down, personnel should be protected from possible electrical shock. When welding is done on metal walls, precautions must be taken to protect combustibles on the other side. Before hot work is begun, used drums, barrels, tanks and other containers must be so thoroughly cleaned that no substances remain that could explode, ignite or produce toxic vapors. Employees exposed to the hazards created by welding, cutting or brazing operations must be protected with personal protective equipment and clothing. Check for adequate ventilation where welding is performed. When working in confined spaces, environmental monitoring tests should be taken and means provided for quick removal of welders in case of emergency.

8.22 Scaffolds

(Reference Conti SOP 34, Scaffolds Procedures)

Scaffolds over six (6) feet in height will have guardrails 42" from the bottom platform with a midrail and toeboards 4" high. Screw jacks will be used to level the scaffold rather than objects such as concrete blocks, loose bricks, etc. Scaffold legs will be braced and tied to structure every 30' in length and 26' in height. Scaffolds should not have makeshift devices or ladders to increase height. Working level platforms will be fully planked between guardrails, and have a minimum of 12" overlap and extend 6" beyond supports. There should be guard netting around the scaffolding if there is a risk of materials falling from the scaffold onto someone below and/or barricades around the scaffolding to prevent anyone from being in the zone below it. The use of scaffolding is not anticipated during remedial activities at Landfill 5.

8.23 Ladders

(Reference Conti SOP 27, Stairway and Ladder Procedures)

Check ladders each and every time before you climb. Ladders should be maintained in good condition: joints between steps and side rails should be tight; hardware and fittings securely attached; and movable parts operating freely without binding or undue play. Non-slip safety feet are provided on each ladder. Ladder rungs and steps should be free of grease and oil. Employees are prohibited from using ladders that are broken, missing steps, rungs, or cleats, or that have broken side rails or other faulty equipment. It is prohibited to place a ladder in front of doors opening toward the ladder except when the door is blocked open, locked or guarded. It is prohibited to place ladders on boxes, barrels, or other unstable bases to obtain additional height. Face the ladder when ascending or descending. Be careful when you climb a ladder. When portable rung ladders are used to gain access to elevated platforms, roofs, etc., the ladder must always extend at least 3 feet above the elevated surface and secured. It is required that when portable rung or cleat type ladders are used, the base must be so placed that slipping will not occur, unless it is lashed or otherwise held in place. All portable metal ladders must be legibly marked with signs reading "CAUTION" - "Do Not Use Around Electrical Equipment." Only adjust extension ladders while standing at a base (not while standing on the ladder or from a position above the ladder). Metal ladders should be inspected for tears and signs of corrosion. Rungs of ladders should be uniformly spaced at 12 inches, center to center.

8.24 Floor and Wall Openings

(Reference Conti SOP 20, Fall Protection Program)
(Reference Conti SOP 36, Signs, Signaling, Tags and Barricade Procedures)

Be careful when working near floor and wall openings. All floor openings (holes) should be guarded by a cover, guardrail or equivalent barrier on all sides except at the entrance to stairways and ladders. Toe boards must be installed around the edges of a permanent floor opening. Before beginning work at a new location, inspect it to insure that all floor openings, which must remain open, such as floor drains, are covered with grates or similar covers.

9.0 SITE CONTROL MEASURES

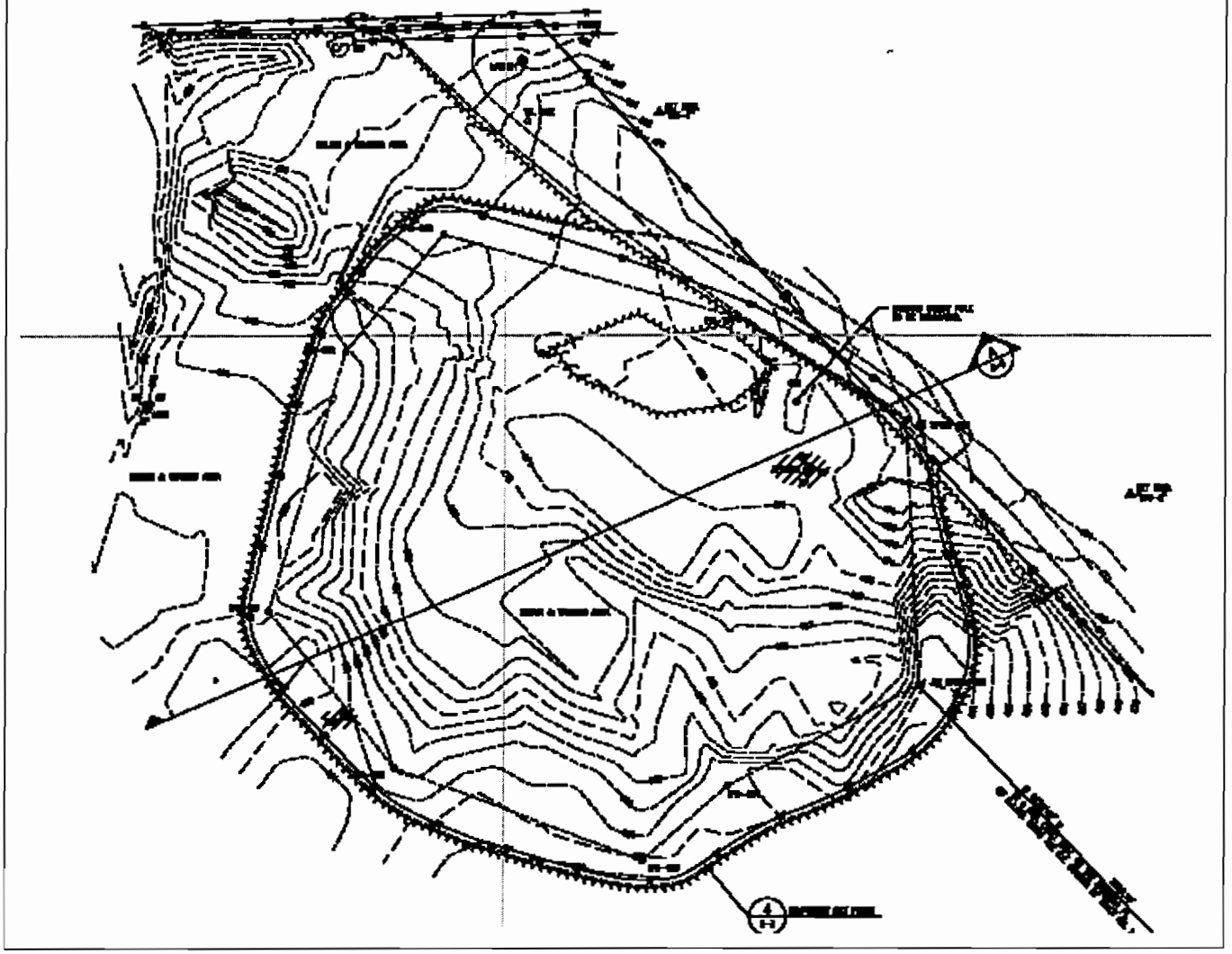
This section outlines site control measures to be implemented to minimize potential exposure to and accidental spread of hazardous substances during remedial activities. Listed below are the work zones that shall be established. The zone boundaries may be modified as necessary as new information becomes available.

9.1 Work Zones

The Site will be divided into Exclusion, Contamination Reduction and Support Zones. It should be recognized that the Site control zones will be modified continually. A map showing the work zones will be updated daily and posted in the Site office. The SSHO will review the location of work zones at the daily safety briefing. Refer to ***"Figure 3 – Site Layout Plan"***.

The SSHO and at least one person who has completed Supervisor's Training will be present at the Site whenever work is performed in the Exclusion Zone or Contamination Reduction Zone. Similarly, at least two First aid/CPR-trained individual will be present at the Site when work is performed in those zones.

Figure 4 – Site Layout Plan



9.1.1 Exclusion Zone (EZ)

This zone, commonly known as the Hot Zone, is where there will be direct contact with the potentially contaminated material. PPE shall be required in this zone. The SSHO shall enforce these requirements. The level of PPE required shall be based on hazard, Site condition and air monitoring performed. The outer boundary of the Exclusion Zone will be delineated with orange safety fence. The Exclusion Zone specifically consists of the perimeter of Landfill 5. Modification to the size and boundary of the Exclusion Zone will be made in the field by the SSHO based on operations and wind direction. The Exclusion Zone may be subdivided into different areas of contamination and different levels of PPE may be assigned based upon the expected type and degree of hazard.

All activities in exclusion zone will be conducted using the "buddy system". This involves a buddy who is able to provide his or her partner with assistance, observe for signs of chemical or heat exposure, check integrity of PPE and go for help when needed.

9.1.2 Contamination Reduction Zone (CRZ)

This zone, commonly known as the Warm Zone, is where workers and equipment shall be decontaminated. This shall minimize the spread of contaminants from the Exclusion Zone into clean areas. The Contamination Reduction Zone will consist of the area located in front of or next to the exclusion zone so that personnel or equipment exiting the EZ can be decontaminated and doff the PPE. Emergency equipment to be located in this area will include eye wash stations, fire extinguishers, first aid kits and other appropriate equipment. The Contamination Reduction Zones or personal decontamination stations will be established adjacent to the Exclusion Zones. These stations will provide a means for prompt removal of potentially contaminated outer PPE at a location convenient to operations.

9.1.3 Support Zone

This zone, commonly known as the Clean Zone, is considered to be uncontaminated. This area shall be used as a storage area for operations equipment and where break and toilet and shower facilities will be located.

9.2 Site Entry and Exit Control Log

All site personnel on this project will undergo safety orientation by the SSHO prior to starting work at the site. This training will include general site safety rules, hazardous locations, personal protective equipment guidelines, and onsite emergency procedures. All site personnel will satisfy the following requirements before initiating work onsite within the Exclusion or Contamination Reduction Zones:

- Receive and pass a physical examination, including certification of ability to wear respiratory protection.
- Receive adequate hazardous waste training according to 29 CFR 1910.120 or 29 CFR 1926.65.
- Receive a briefing on all aspects of the SSHP.
- Are properly dressed, equipped, and trained in accordance with all personal protective guidelines.
- Are thoroughly trained regarding decontamination procedures.
- All personnel performing tasks when respiratory protection is needed will comply with the requirements of this plan

All personnel entering and exiting the Exclusion and Contamination Reduction Zones will sign in and out through the Support Zone. The log will indicate the date and time entering and exiting, the location visited,

personal protective equipment utilized and decontamination procedures, refer to ***Attachment 3 – Safety and Health Forms for the Site Entry and Exit Log.***

10.0 PERSONAL HYGIENE AND DECONTAMINATION

Decontamination (Decon) is the process of removing or neutralizing potentially harmful contaminants that have accumulated on personnel and equipment in order to reduce the spread of contamination outside the work area. Decontamination is critical to the Safety and Health of Site workers and it protects the community by minimizing the off-site migration of contaminants. One of the most important aspects of controlling contaminated material migration is the prevention of the spread of contamination. Good contamination prevention will minimize employee and public exposure.

All personnel and equipment leaving the Exclusion Zone must be decontaminated in the Contamination Reduction Zone prior to entering the Support Zone. The decontamination process is composed of a series of steps performed in a specific sequence. The basic concept is that more heavily contaminated items will be decontaminated and removed first, followed by decontamination and removal of inner, less contaminated items.

During remedial activities at the Site, all items taken into the Exclusion Zone must be considered contaminated and must be carefully inspected and/or decontaminated before leaving the Site. All contaminated vehicles, equipment and material shall be cleaned and decontaminated to the satisfaction of the SSHO prior to leaving the Site. Decontamination procedures will be posted at every decontamination station throughout the project.

10.1 Personal Decontamination

Personnel exiting the Exclusion Zone during remedial activities at the Site shall follow the procedure below.

As the worker leaves the Exclusion Zone, he places his equipment and tools in the Exclusion Zone or Contamination Reduction Zone. After the worker places his equipment and tools down, gross contamination will be removed from outer clothing and boots. Workers will then remove their outer boots and outer gloves and place them in plastic garbage bag-lined containers.

Once outer gloves are removed, workers will remove all outer garments and place them in plastic garbage bag lined containers. Once workers are fully decontaminated and all garments are removed, workers will remove their respirators (applicable to level C) followed by removal of inner gloves. Used cartridges and inner gloves will be placed into plastic garbage bags.

All decontamination stations will be established on (2) - 6 mil. plastic sheets, covered with approximately 2 inches of stone. The stone will be replaced of as often as is deemed appropriate.

10.2 Respirator Decontamination

Respirators are to be decontaminated, cleaned and sanitized before reuse. Cartridges and/or filters must be replaced as needed and, as a minimum, changed daily. The respirators are then cleaned with cleaning and sanitizing solutions, wiped dry and placed into sanitary containers or bags and sealed closed.

10.3 Equipment Decontamination

Nearly all contractor hardware (not consumable) is considered to be recoverable. As such, they will be decontaminated using the proper equipment, i.e. brushes, sprayers, detergent and, if necessary, other appropriate solvents. Large heavy equipment will be decontaminated with pressure steam wash as required.

The decontamination area for vehicles and equipment leaving the Exclusion Zone will be located within the Contamination Reduction Zone. Equipment will be decontaminated over 2 layers of 6-mil plastic placed on the ground. Scrapers and brushes will be used to remove gross contamination prior to final decontamination. A pressure steam cleaner will be used for the final cleaning and decontamination of the equipment. The combination of dry removal with the brushes and use of the steam cleaner will minimize the generation of contaminated liquid. All solids and liquids will be collected for disposal. Efforts will be made to minimize soil (even non-contaminated soil) from being tracked off-site. Dirt and mud will be removed from trucks and vehicles leaving the Site to the extent practicable.

10.4 Decontamination Log

A decontamination log will be maintained and will list the equipment name and model number, the equipment I.D. number, the activities the equipment was used for, the method of decontamination, amount of decontamination, date and time of decontamination and names of personnel doing the decontamination. This log will be maintained by the SSHO and included in the Safety and Health Report. Refer to ***Attachment 3 – Safety and Health Forms for the Equipment Decontamination Log***.

10.5 Decontamination Residue

Decontamination residue consists of disposable PPE (such as Tyvek, gloves, tape and cartridges) and settled solids. Decontamination residue will be drummed and stored in the Exclusion Zone until subsequent disposal or shipment to a disposal facility.

10.6 Personal Hygiene and Sanitation

Hands and face shall be thoroughly washed before eating, smoking, drinking, chewing gum or tobacco.

When possible, avoid contact with contaminated materials.

Temporary support facilities such as wash facilities, eating areas, changing areas, and portable toilets will be located in the Support Zone. This area will remain "clean" and free of contamination.

An adequate supply of potable water will be provided to the employees working at the Site. Clearly labeled potable containers will be used to dispense drinking water. Containers will be cleaned at the beginning of each day. The containers will be equipped with taps to access the water. Clean disposable cups will be provided daily.

Portable toilet facilities will be provided on-site for employees and will be located in the Support Zone.

Eating, drinking, smoking, chewing gum or tobacco or any practice that increases the probability of hand-to-mouth transfer and ingestion of material is prohibited during remedial activities except in designated eating or smoking areas outside the Exclusion and Contaminant Reduction Zones. Conti employees, subcontractor

employees, and service personnel are required to thoroughly decontaminate themselves prior to entering the Support Zone.

11.0 EMERGENCY CONTINGENCY PLAN

This section describes the emergency response plan that shall be implemented by Conti employees to handle emergencies. The nature of the project, the contaminants present and the activities planned for the site are such that there is little potential for an emergency, which would result in a significant release of hazardous substances, and in any way threaten the adjoining community. However, there is always the potential at any construction site for emergency situations to occur which threaten the on-site workers. Possible examples of emergency situations during remedial activities include equipment fires, or contact of equipment with overhead power lines. In all of these cases, procedures will be implemented to minimize the possibility of an emergency situation. The procedures outlined below are designed to ensure that the workforce reacts quickly and appropriately to emergency situations, thereby protecting the health and well being of the individual workers. It is expected that modifications may be necessary upon actual site set-up and conditions. Furthermore, Conti Environmental's Corporate Safety, Health and Environmental Program and Procedures Manual include Conti's Corporate Emergency Action Plan Policy and Guideline for Handling Emergencies.

11.1 Pre-Emergency Planning

During the site safety briefings held daily, all employees will be informed of the location of this plan, the procedures outlined in this plan, and the communication systems and evacuation routes to be used during an emergency.

On a continual basis, individual personnel should be constantly alert for indicators of potentially hazardous situations and for signs and symptoms in themselves and others that warn of hazardous conditions and exposures. Rapid recognition of dangerous situations can avert an emergency.

A coordination meeting with local emergency response agencies (fire, police, rescue and medical facility) will be conducted prior to work starting at the site. The site activities and potential hazards that may be encountered by responders will be reviewed during this meeting.

11.2 Personnel Responsibilities

All on-site employees have a role in mitigating an emergency incident. The Project Superintendent has primary responsibility for responding to and directing emergency response operations to correct emergency situations. This includes taking appropriate measures to ensure the safety of site personnel and the public. He is additionally responsible for ensuring that corrective measures have been implemented, appropriate authorities notified, and follow-up reports completed. The SSHO shall assist and advise the Project Superintendent, and will direct any emergency medical responses.

The following is an outline of job titles and corresponding responsibilities during an emergency.

- The Site Superintendent directs emergency response activities; serves as liaison with appropriate Client and Client representatives personnel and subcontractors. In the event of an emergency the Project Superintendent will be the Incident Commander.

- The Site Safety and Health Officer recommends that work be stopped if any operation threatens worker or public health or safety. Advises Site Manager of emergency procedures if necessary. Provides emergency

medical care on site. Notifies emergency services. The SSHO will assume the responsibility of Incident Commander if the Project superintendent is off-site.

11.3 Evacuation Routes and Procedures

In the event of an emergency that necessitates an evacuation of the site, on-site personnel shall be notified by hand-held or mobile two-way radios to leave the area by immediate emergency exit. An alternate method of communication will be the use of a portable air horn sounded in regularly spaced, repeated blasts.

During an evacuation, all non-emergency radio transmissions shall cease. The SSHO, in conjunction with the Project Superintendent, shall control the scene until the appropriate municipal and state agencies arrive and a site specific Incident Command System (ICS) should be implemented. Since site conditions, i.e., wind direction, precipitation, and work location, change often, the SSHO will determine the appropriate evacuation procedures.

All personnel shall assemble/muster at the Contamination Reduction Zone (CRZ) or Support Zone. Access to the site will be restricted. All non-emergency radio transmissions shall cease.

11.4 Emergency Decontamination Procedures

Decontamination of an injured or exposed worker will be performed if decontamination does not interfere with essential treatment. The objective is to successfully administer first aid without exposing rescue workers and the victim to contaminants. Project personnel will meet with the local hospital to discuss the possibility of having to treat injured personnel from the site.

If the hazards are low and decontamination can be performed, then a wash, rinse and removal of protective clothing will be performed.

If the hazards are high and decontamination cannot be done, then the following procedures will be performed:

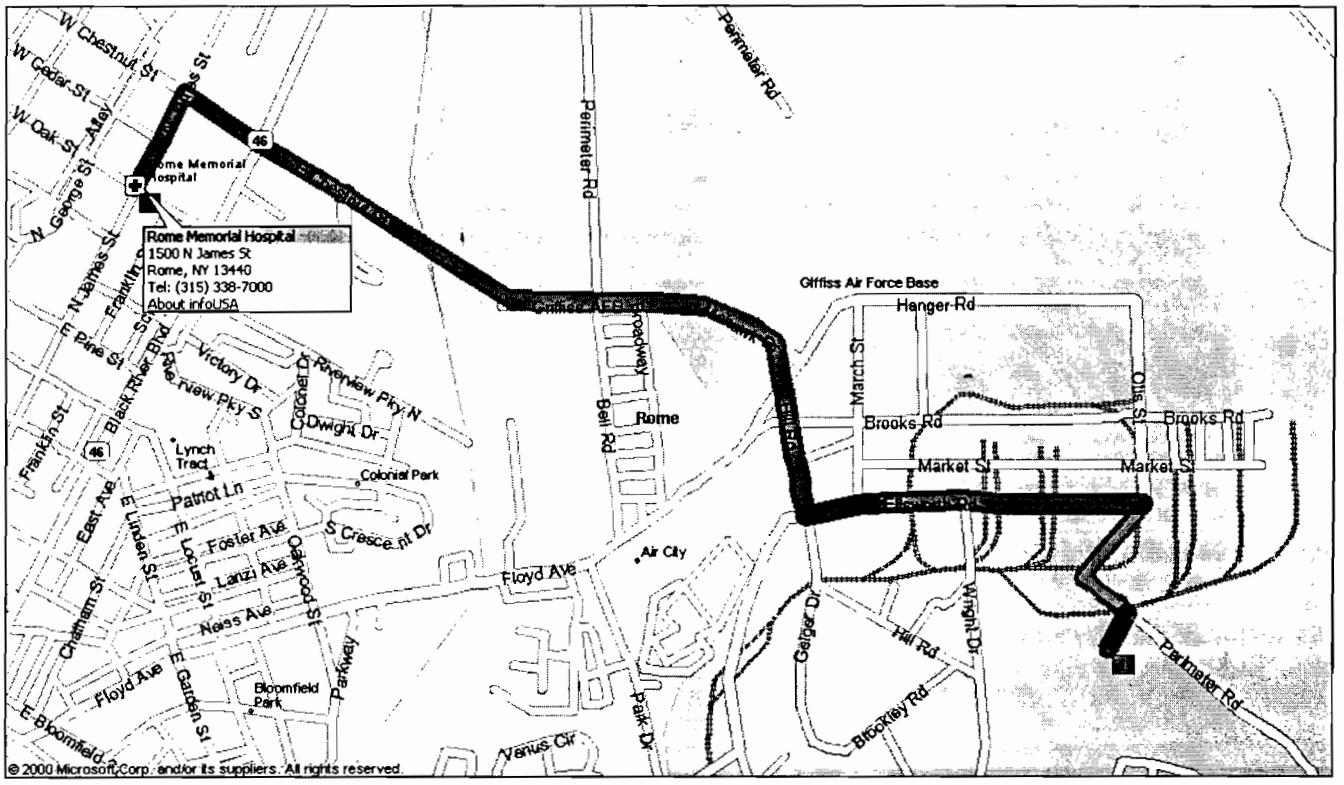
- Wrap the victim in blankets or plastic sheeting to reduce contamination of rescue workers or other personnel.
- Alert emergency and medical personnel to potential contamination. Emergency entry into the exclusion zone will be controlled by the SSHO. The SSHO will determine if the victim can be moved from the exclusion zone. If entrance into the exclusion zone is required, the SSHO will ensure that the emergency workers don the proper PPE.
- If required, arrange to have the SSHO, who is familiar with the site to accompany the victim to the hospital if required.

11.5 Medical Treatment/First Aid

Both the Site Superintendent and the Site Safety and health Officer are trained in CPR and First Aid and have first aid kits for use in a medical emergency. First Aid Kits will be located in the main support area, Contamination Reduction Zone and at the work activity locations. Eyewash stations will be available at the Contamination Reduction Zone. Eyewash stations will be of the pressurized, 15-minute discharge type. On-site employees have a basic knowledge of first aid and will assist the Site Superintendent and SSHO. Community emergency services (EMS, Fire, and Police) shall be notified immediately if their resources are needed on site.

If necessary, the injured or sick party shall be taken to Rome Memorial Hospital– Please refer to ***Figure 4 – "Route to Hospital Map" and Attachment 3–Safety and Health Forms*** for directions to the area hospital. Route to the area hospital will be posted and easily visible at all times.

Figure 5 - Route to Hospital Map



Direction to Rome Memorial Hospital: Turn LEFT (West) onto Perimeter Rd, Turn LEFT (West) onto Ellsworth Rd, Turn RIGHT (North) onto Hill Rd, Bear LEFT (North-West) onto Mohawk Dr, Bear RIGHT (West) onto E Chestnut St, Turn LEFT (South) onto N James St and Arrive Rome Memorial Hospital [1500 N James St, Rome, NY 13440, Tel: (315) 338-7000]

11.6 Emergency Alarms/Notifications and Procedures

When any emergency occurs on-site, the on-site SSHO and Project Superintendent shall be notified immediately. The Project Superintendent or the SSHO shall notify the client and his representatives. Please refer to the ***Table 9 – "Emergency Telephone Numbers" and Attachment 3 – Safety and Health Forms*** for emergency telephones. Emergency Telephones will be posted and easily visible at all times.

To notify any site workers of an emergency, workers can be signaled by way of hand held or mobile two-way radios or as a backup, the use of an emergency alarm (portable air horn). Any audible pattern of blasts from a portable air horn becomes difficult to interpret due to distance and the inhibitory effects of a respirator.

Table 9 – Emergency Telephone Numbers

Police Department:	
Emergency	911
Rome Police Department	315-339-3311
Fire Department:	
Emergency	911
Rome Fire Department	315-339-7784
Ambulance Services:	
Emergency	911
Amcare Ambulance Service	315 339-5600
HAZMAT Team:	
Emergency	911
Rome Fire Department (HAZMAT TEAM)	315-339-5600
Hospital:	
Rome Memorial Hospital 1500 N James St, Rome, NY	315 338-7000
Occupational Physician:	
Environmental Occupational Specialist (EOSI) Dr. Robert MacMillan	508-698-0444
Conti Environmental, Inc.:	908-561-9025
James Stewart, V.P. of Operations	908-307-1527 (Cell) / 732-363-9417 (Home)
John Czapor, V.P. of Environmental Services	732-989-3314 (Pager) / 732-972-3326 (Home)
Aldo M. Gonzalez, Safety and Health Manager	908-403-6237 (Cell) /212-929-8683
Tom Hernon, Project Manager	732-873-3015 (Home)
Glen Stasiak, Project Superintendent	908-403-1942 (Cell) / 732-478-1149 (Pager)
Kenneth Shultz, Site Safety and Health Officer	716-737-7579 (Cell) 732-916-6521 (Pager
SCI UXO/OE Services (UXO Support) Leo Carden PE, Project Engineer Doug Lamothe, Director Of Services Cheryl Riordan, Safety Manager	256) 864-0018
US Army Corp of Engineers	
Joseph Wojnas, Project Engineer	315-330-7368
William G. Ebersbach, Resident Engineer	315-772-4103
Phil Rosewicz, Project Manager (Kansas City District)	816-938-3902
Griffiss Air Force Base	
Mike Wojnas, Environmental Engineer (AFBCA)	315-330-2275
Cathy Jerrard, Environmental Engineer (AFBCA)	315-330-2275
NYS Department of Environmental Conservation	
Emergency Spill Hotline Phone Number	800-457-7362
National Response Center	800-424-8802
CHEMTREC	800-424-9300

All emergency communications will flow through the radio network. Outside emergency services will be notified, as necessary. The site evacuation alarm consists of one long blast on a horn, every 10 seconds. Any time the alarm system is activated; on site personnel will be notified immediately. Personnel will extinguish any nearby ignition source and prepare for emergency response activities. This alarm will also be used to alert personnel of a sudden release of hazardous materials.

The observer of the emergency condition will brief the responding personnel as to the nature and location of the incident. When they have assessed the situation, a decision whether or not to implement these procedures will be made. If these Emergency Contingency Procedures are not implemented, the "All Clear" will be given verbally by supervisory personnel. The "All Clear" will be used to indicate a return to normal (non-emergency) conditions following emergency response activities. The alarm signals will be prominently posted at the site. The audible alarm system will be discussed with each resident within hearing range of the alarm system.

11.7 Implementation Of The Plan

There is a logical sequence of steps to follow in responding to emergencies, which should be followed by site personnel. This sequence involves identifying the emergency, investigating the extent of the emergency, deciding on the proper initial course of action, taking corrective action to rectify the situation, and following up with a post-emergency investigation.

Equipment breakdowns, power failures, injuries and natural disasters are usually rather dramatic and will capture the individual's attention immediately upon occurrence. In other cases, the individual may have prior warning of impending emergencies through weather reports in the case of natural disasters and trends in equipment performance in the case of some breakdowns.

Some emergency situations exist long before the operator is aware that an emergency exists. These cases may produce situations, which then become immediate and obvious. For example, unattended equipment may have minor breakdowns which go unnoticed; further operation thus leading to complete breakdown of the equipment resulting in possible injury to the unwary bystander.

In the event of a fire, explosion, accidental material release, or any other emergency, response activities will be initiated following the evaluation of the event. An assessment of the situation will be performed by the SSHO immediately upon notification. The Superintendent/SSHO is authorized to commit resources to the extent detailed in this plan. If it is determined that an emergency situation exists, he will then implement the appropriate emergency response activities.

In the event that a medical emergency or accident occurs in the Exclusion Zone, all personnel responding to the emergency should be outfitted in the Personal Protective Equipment appropriate for the situation. As a general rule, personnel should not enter the Exclusion Zone without donning the minimal level of PPE required. In the event that a worker is overcome or disabled for an unknown reason, the Superintendent/SSHO must make a determination as to the level of respiratory protection, which is appropriate. Specifically, a determination must be made as to whether Supplied Air Respirators are necessary for the protection of the responders.

11.7.1 Conditions for Implementation

The contingency plan will be activated by the Superintendent/SSHO immediately, in the event of a fire or explosion, or emissions of toxic chemicals in excess of limits set forth by Federal, State, and local agencies. In the event of a spill or material release, it will be up to the Superintendent/SSHO to make a determination as to when emergency conditions exist, as opposed to routine maintenance of the site. His determination will depend upon the location of the spill, the size of the spill, weather conditions and the proximity of the release to workers, the community and environmental receptors.

Once it becomes apparent that an emergency situation exists or that a disaster is impending, the Project Superintendent or his designee should immediately be notified and an immediate investigation conducted. Assessment of the emergency should include assessing the severity of the situation and collecting enough information to make an initial action decision.

Assessing the emergency should include identifying injured persons (if any), damage to buildings and equipment, noting potential impending damage if corrective action is not taken immediately, and itemizing resources required to correct the situation.

11.7.1.1 Fire or Explosion

Although the potential for fire or explosion is minimal, sources of risk do exist. These sources include welding gases, gasoline for portable equipment, diesel fuel for the heavy equipment and combustible debris. In the event of an explosion, possible emergency conditions would exist. Unless extinguished immediately, a fire or explosion will trigger implementation of these procedures.

11.7.1.2 Material Spills

Material Spills could occur during truck loading and from vehicle accidents. Additionally, equipment fueling operations could produce spills. Ultimately, a spill could contaminate receiving surface water or cause a release of vapors to the air. A spill of fuel could also ignite. A small spill should be cleaned up immediately, but should not trigger activation of these procedures. Should an on site spill occur, the immediate response will include closing off the source of the spill, if possible, application of the sorbent material or sand bagging, and street sweeping, as appropriate. Any spill that results in a discharge to off site surface water will be contained with sorbent booms as needed. All spills will be investigated, and a written report will be provided to the regulatory agencies in accordance with applicable regulations.

11.7.1.3 Severe Weather

In the event of severe weather, the Site Superintendent and/or the HSO have the authority to stop operations and direct evacuation procedures, if conditions warrant. All equipment will be secured and grounded. After the storm, a visual inspection will be performed by the Superintendent and/or the HSO to check for damage and hazards. These will be performed before any work is resumed. If damage or hazards are noted, the designated or other Conti personnel will evaluate the conditions and implement corrective actions to repair the damage or eliminate the hazard. These actions will begin as soon as possible and will take precedence over other site activities.

11.7.2 Initial Action

Once the extent of the emergency is known, the Superintendent and the SSHO will make an immediate decision as to what initial steps should be taken to remedy the emergency situation. This first action, in the case of large-scale emergencies, usually consists of notifying responsible authorities and/or calling for the necessary assistance in order of priority.

The individual(s) should not unduly endanger him or herself or others by attempting tasks for which the proper equipment is not available or with which he or she is unfamiliar. In all cases, if in doubt, wait until qualified help arrives before taking action.

11.7.3 Corrective Action

When help arrives, the site superintendent/SSHO should immediately inform those called of the pertinent details of the situation. Corrective action should be continued until the situation is either under control or completely rectified. If corrective actions will take considerable time, a long-term effort to complete the task should be developed.

11.7.4 Follow-through

After the situation is corrected, the cause of the emergency event is to be determined and review of the corrective actions taken, etc. In the case of equipment failure, if negligence was not a factor, then revising maintenance procedures would be the most likely first preventive step. For natural disasters that cannot be prevented from recurring, the procedures followed in dealing with them can be reviewed to develop more effective action plans. The entire event, along with all of the responses, will be thoroughly documented for review by management and project supervisory personnel.

11.8 Spill Response and Control Plan

The purpose of this section is to define practices and procedures for the prevention, containment and cleanup of accidental discharges of hazardous substances during the project. These substances include both the contaminated material managed as a result of the remedial project, such as contaminated soils and decontamination liquids, and construction materials typically found on any construction site, such as lubricating fluids, diesel fuel, gasoline, etc.

Spill prevention applies to all types of spills and can be described as the first and simplest approach to spill control. Human error is a major contributing factor to spills and releases. An awareness of spill consequences, preventive measures and countermeasures will greatly reduce spill occurrences. A sound prevention program includes careful work practices, constant inspection, and immediate notification and correction of deficiencies. In the event that a spill does occur, proper containment and cleanup procedures must then be followed in order to reduce the effect of the spill.

11.8.1 Prevention

Prevention of unnecessary spills is of first priority. Prevention measures include:

- Operators and drivers will exercise extreme caution when transporting material around the site.
- When removing hoses from machines an appropriate and adequate supply of absorbents will be on hand. A supply of the following absorbents will be kept on-site: oil sorbent booms, rolls and pillows, universal towels and sheets and vermiculite.
- Hoses will be capped when not connected to their appropriate fitting.
- All containers will be inspected daily for decay. No open container shall be exposed to rainfall, snowfall, etc. without being emptied and cleaned of residue.
- All equipment will be inspected for leaks before and after service.
- Storage of material such as fuels, oils, and solvents on-site will be limited to the minimum required. All fluids will be stored in individual fluid containers appropriate and approved for the material. Most of the individual fluids containers will be further secured by storage in large, locked tool and equipment storage containers. Drums or other containers too large to be stored in containers will be stored raised off the ground on a liner and covered by plastic.

11.8.2 Reporting

All spills will be reported immediately to appropriate field and office management personnel. The sequence of reporting will be as follows:

- Notification by workers to the Project Superintendent or Site Safety and Health Officer.
- The Project Superintendent or Safety and Health Officer will immediately notify the Contracting Officer Representative regardless of the size of the spill.

- Conti Environmental, and the Contracting Officer Representative will jointly determine the nature of the spill, its size, direction of travel, if anyone has been injured as a result of the spill and whether it requires immediate notification to regulatory agencies.
- The Contracting Officer Representative will have primary responsibility for notifying the regulatory agencies. Conti will have follow-up responsibility to verify that the notification is made in a timely manner.
- If a reportable spill occurs and the COR (or AFBCA) cannot be immediately reached, Conti will primary responsibility to report the spill to the regulators (reportable spills will be called into the NYSDEC spill hotline within two hours of the incident and a spill number obtained).
- A full list of emergency contacts and telephone numbers is included this plan. This list includes Conti personnel as well as federal, state and local authorities. This list will be posted in all trailers on-site.

Upon notification of a spill, all project activity will be immediately suspended and all necessary equipment and personnel will be diverted to spill control and containment. In the event of a spill, and regardless of the size, a Spill Incident Report will be submitted to the Contracting Officer Representative with a copy to the USEPA within 48 hours of the incident.

11.8.3 Spill Response Equipment

Given the nature of this project, all the necessary equipment and personnel necessary to deal with a release of hazardous substances will be available on site. In addition to the heavy equipment and personal protective equipment, which is critical to spill control, Conti will have on hand an ample amount of sorbent materials, UN1A2 open top drums and overpacks.

11.8.4 Confinement and Containment

Prior to entering a spill area, all workers must be protected from any adverse effects of the spilled material. No one will enter any spill area alone. The Site Safety and Health Officer will determine the level of protection required for response activities. To the extent practicable, the area will immediately be cordoned off and, if appropriate, exclusion, contamination reduction and support zones will be established.

The decision to use confinement techniques such as diversion, diking and retention, are generally based on time, personnel, equipment and supplies. As mentioned above, all necessary resources will be available on-site at all times. To the extent the nature of the material is known, the decision should be made based upon a review of the harmful effects of the material. In the event of a large migrating spill, an unlikely circumstance, diversion techniques, such as placing a soil wall or absorbent boom ahead of the spill, shall be implemented first. Subsequently, diking techniques, such as using material such as sand covered with liner material (PVC, hypalon) should be implemented.

11.8.5 Cleanup

Once a spill has been contained and the source of the spill corrected and controlled, cleanup can begin. Spill cleanup can proceed at the same time as containment if feasible. Supervisory personnel will determine the appropriate cleanup methods. The Site Safety and Health Officer will determine the appropriate level of protection depending upon the nature of the material.

- The first action will be to absorb free liquids with absorbent pads, booms, pillows, or clay. The absorbent material will be placed in drums and moved to an appropriate storage location. Subsequent to the removal of free liquids, soil believed to be contaminated will be excavated and containerized in drums or stockpiled on poly sheeting and covered for further testing.

- Dry spills, while posing less of a risk of migration, will still require appropriate and immediate action. The nature of the spilled material will be ascertained. The spilled material will be recovered for reuse if appropriate. Material which cannot be recovered and residual contaminated soil will be shoveled into 55-gallon drums, placed in the drum storage area and sampled and analyzed for waste characterization and disposal.
- Once containerized, Conti Environmental will provide for the appropriate sampling and analysis for waste characterization and disposal facility acceptance. Results of waste characterization analysis, waste profiles and manifests will be provided to the Construction Representative for review.
- All spilled material and visually contaminated soil will be excavated and containerized in the initial spill response. If there appears to be a possibility that contaminants have migrated into the surrounding soil, post-remedial sampling will be initiated. Soil samples will be taken from the areas of suspected contamination and analyzed for the compounds, which were released.

Personnel Decontamination - In general, all spill response operations will be performed in accordance with the provisions of the approved Site Safety and Health Plan.

11.9 Report/Review

A written report shall be made within 24 hours of incident resolution. The Contracting Officer Representative will be provided with a copy. In addition, all key personnel will have a meeting within 48 hours of the incident to discuss and critique all of the aspects of the Emergency Contingency Plan according to new site conditions and lessons learned.

12.0 INSPECTION AND REPORTING

12.1 Safety and Health Inspections

Safety and Health inspections will be conducted to discover, through specific, methodical auditing, checking, or inspection procedures, conditions and work practice that lead to job accidents and illnesses.

The Health And Safety Manager shall be responsible for ensuring that inspections are conducted at the frequency stated; reviewing the Daily Safety and Inspection Logs for completeness, thoroughness, and trends; performing bi-monthly project inspections; and training site personnel on proper inspection techniques. The Health and Safety Officer shall be responsible for ensuring that daily inspections are conducted; reviewing the inspections findings and corrective actions for applicability and thoroughness; and providing the site management personnel with a summary of inspection findings each month.

The Site Safety and Health Officer will develop a safety report based on the deficient inspection items noted during the inspection and conveying the deficiencies to the CQCSM via a Non-compliance Identification / Corrective Action (NICA) Report (refer to Appendix H of the Quality Control Plan). The CQCSM will enter the deficiencies a master deficiency-tracking log. The CQCSM and the SSHO will discusses the existence of the deficiency with the appropriate work force individual(s) responsible for its correction. A corrective plan of action is developed and implemented following USACE approval, if needed. Deficiencies are tracked in accordance with the Quality Control Plan.

12.2 Daily Safety and Inspections Log

The SSHO shall insure that all aspects of the SSHP are complied with on a daily basis. Only one warning shall be given to individuals not complying with the SSHP. The SSHO has the authority to shut the [illegible] and

ban any individual from the Site. If deficiencies are noted, they will be recorded on the Daily Safety and Inspection Log and will be corrected immediately. The Daily Safety and Inspection Log will be attached to the Daily Quality Control Report. The Daily Safety and Inspection Log will include the date, work area, employees present at the work area, PPE and work equipment in each area, specific safety and health issues and notes and the signature of the preparer. Refer to ***Attachment 3 – Safety and Health Forms for the Daily Safety and Inspection Log.***

12.3 Certification of Worker/Visitor Acknowledgment

A Certification of Worker/Visitor Acknowledgment will be submitted to the Contracting Officer prior to initial entry onto the Site. The certification/acknowledgment will include both formal, field and site-specific training received, personal protective equipment supplied and trained in use, and medical certification. Certificates and Medical certification will be kept on file at the site. Refer to ***Attachment 3 – Safety and Health Forms for the Certificate of Worker/Visitor Acknowledgement.***

12.4 Incident Reports

Incident reporting will ensure an immediate report on all incident/accidents and to provide an effective follow-up for corrective action in order to eliminate unsafe practices and unsafe conditions. An **Incident/Accident Form** must be completed within 24 hours of the Incident/Accident. This report is utilized in the event of injuries, off-site releases, utility breaks, or accidents. Immediately following the incident/accident, the Site Superintendent and the Site Safety and Health Officer will initiate and Incident/Accident Investigation. An Accident Report shall be completed on ENG Form 3394 ands submitted to the Contracting Officer with in 2 days. ***Refer to Attachment 3 – Safety and Health Forms for the Incident/Accident Form and USACE ENG-3394 Accident Report.***

"Near misses" will be documented by the Site Safety and Health Officer and discussed at the morning safety briefings to educate the work force to potentially hazardous operations or practices.

Copies of Conti Environmental's OSHA 200 Log, that summarizes recordable injuries and lost-time accidents, will be submitted to the Contracting Officer monthly. ***Refer to Attachment 3 – Safety and Health Forms for the OSHA 200 Log.***

12.5 Daily Air Monitoring Report

The Daily Air Monitoring Report will be prepared by the SSHO. The Report will include all air monitoring data collected including real-time monitoring, personal monitoring within the Exclusion Zone, and perimeter monitoring. **Refer to** ***Attachment 3 – Safety and Health Forms for the Daily Air Monitoring Report***

12.6 Weekly Safety Meeting/Daily Tool Box Talks

As part of Conti Environmental's Corporate Safety and Health Program, a Weekly Safety Meeting is conducted on Monday mornings and Daily toolbox Talks. This safety meeting outlines current industry safety issues and allows for discussion of job-specific issues. In addition, a daily site briefing will be held to discuss current work activities and hazards for the day along with the air monitoring results from the previous day. The SSHO/Superintendent will conduct Daily Tool Box Talks and Weekly Safety Meetings with ALL on-site personnel Refer to ***Attachment 3 – Safety and Health Forms for Daily Toolbox Talks and Weekly Safety Meetings.***

In addition to the daily toolbox talks and the weekly safety meeting, Conti will conduct monthly project management safety meetings. All site management, including sub-contractor personnel, are required to attend. Topics of discussion will include: hazards identified and abated during the previous month, any outstanding action, new tasks to be performed, site concerns etc. The SSHO will submit a synopsis of each meeting including topics covered, safety-related concerns, action items to be addressed, status of previous items and a signed attendance list.

12.7 Monthly Exposure Report

A Monthly Exposure Report will be prepared by the Safety and Health Manager and submitted to the Contracting Officer Representative. This report will include a compilation of manhours worked each month for the project (both Conti and subcontractors), the number of accidents, severity, class of accident and lost time for each month.

12.8 Safety and Health Phase-Out Report

The Safety and Health Phase-Out Report will be submitted within 10 days following completion of the work. The following information will be included:

- Summary of the overall performance of safety and health (accidents or incidents including near misses, unusual events, lessons learned, etc.).
- Final decontamination documentation including procedures and techniques used to decontaminate equipment, vehicles, and on site.
- Summary of exposure monitoring and air sampling accomplished during the project.

ATTACHMENT 1
ACTIVITY HAZARD ANALYSIS

ACTIVITY HAZARD ANALYSIS

Project: **Griffiss AFB – Landfill 5** DATE: **December 14, 2001**

Activity: **Mobilization/Site Preparation** AHA NUMBER: **GAFB-001**

Potential Safety/Health Hazard	Recommended Controls
Biological (i.e. Plants, Insects, Snake, and Infectious Material)	Avoid insect nest or likely habitats of snakes and Use tick and insect repellant--Check skin and clothing for tick periodically throughout the day
Chemical Spill during refueling operations or general equipment maintenance	Good Housekeeping Practices--Maintain Spill Response Equipment--Practice Spill Prevention at ALL Times--Proper Chemical Storage--Spill Control And Countermeasures Plan In Place For Spills Encountered During Work Activities
Contact With Sharp Objects/Material	Identify And Guard Sharp/Protruding Objects (I.E., Rebar Caps)--Use Caution And Be Aware Whenever Working Around Sharp Objects--Wear Appropriate Personal Protection Equipment (I.E., Gloves)
Contact With Underground Utilities	Contact Local Mark-Out Authority to Identify And Mark Underground Utilities--Keep Heavy Equipment At Least 10 Feet From Power Lines--When An Unknown Hazard Has Been Encountered, Work Will Stop Until Hazards And Controls Are Identified And In Place
Overhead Power Lines	Keep Heavy Equipment At Least 10 Feet From Power Lines--Spotters Assigned Where Necessary-- Only the utility company is authorized to de-energize, insulate or handle the lines-- Don't locate equipment in a position where it can come in contact with overhead power lines
Electrical Shock	Electrical Work Performed By Qualified Person--Use Ground Fault Interrupter Circuits (GFIC)--Inspect and replace damaged Electrical Cords And Tools--Follow Lockout/Tagout Procedures as required--Keep Heavy Equipment At Least 10 Feet From Power Lines
Exposed To Vehicle Traffic	Develop, Implement and Follow Traffic Control Plan--Flaggers/Spotters Assigned Where Necessary--Use Safety Reflective Vest When Working Around Active Traffic
Exposure To High Noise Levels	Wear Appropriate Personal Protection Equipment (I.E., Ear Plugs/Muffs)--Instruct Personnel On Use Of Hearing Protection--Employees On Hearing Conservation Program
Exposure To High/Low Ambient Temperatures	Discuss Signs/Symptoms Of Heat/Cold Stress--Drink Cool/Warm Liquids, As Appropriate--Monitor Temperature
Hand/Power Tools	Ensure Personnel Are Trained On Specific Tools--Inspect Tools Before Each Use--Use Correct Tool For The Job--Make Use Of All Safety Devices And Ensure They Are Functioning
Handling Heavy Objects/Material	Use Proper Lifting Techniques--Utilize Proper Hoisting/Material Handling Techniques and/or Equipment--Use Buddy System For Heavy, Awkward Loads--Distribute Loads Evenly
Struck By/Against Heavy Equipment	Only Qualified employees will be authorized to a operate Heavy equipment--Approach Equipment Within The Operators View--Equipped With Back-Up Alarm/Seatbelt--Inspect Equipment Regularly--Hand Signal By DESIGNATED Worker

Walking/Working Surface	Good Housekeeping Practices--Keep Walkways And Work Areas Clear Of Hoses, Cords, And Clutter--Restrict Site To Essential Personnel--Wear Appropriate Safety Shoes

Equipment Used	Inspection requirements	Training Requirements
Level D PPE Hand/Power Tools Trucks	Daily Safety Inspection Inspect tools/equipment before use Inspect PPE before use	40-Hour HAZWOPER Training 8-Hour HAZWOPER Supervisor (as required) Project Specific Training First Aid/CPR Training (as required)

ACTIVITY HAZARD ANALYSIS

Project:	**Griffiss AFB – Landfill 5**	DATE:	**December 14, 2001**
Activity:	**Erosion And Sediment Control**	AHA NUMBER:	**GAFB-002**

Potential Safety/Health Hazard	Recommended Controls
Biological (i.e. Plant/Insect/Snake/Infectious Material)	Avoid insect nest or likely habitats of snakes and Use tick and insect repellant--Check skin and clothing for tick periodically throughout the day--Wear Appropriate Personal Protection Equipment
Contact With Sharp Objects/Material	Identify And Guard Sharp/Protruding Objects (I.E., Rebar Caps)--Use Caution And Be Aware Whenever Working Around Sharp Objects--Wear Appropriate Personal Protection Equipment (I.E., Gloves)
Exposure To High Noise Levels	Wear Appropriate Personal Protection Equipment (I.E., Ear Plugs/Muffs)--Instruct Personnel On Use Of Hearing Protection--Employees On Hearing Conservation Program
Exposure To High/Low Ambient Temperatures	Discuss Signs/Symptoms Of Heat/Cold Stress--Drink Cool/Warm Liquids, As Appropriate--Monitor Temperature
Drum Handling Activities	Follow drum handling/sampling procedures--DO NOT disturb Bulging drums--Perform air monitoring -- Use mechanical lifting equipment to handle drums (slings/grapplers)—use non-sparking tools to open/sample drums--Use Level B Personal Protective equipment when handling unknown drum. Secure area around drum handling activities
Flying Debris	Ensure guards are installed and working on tools/equipment--Initiate Dust Control Measures--Wear Appropriate Personal Protection Equipment (I.E., Safety glasses/goggles/face shields)
Hand/Power Tools	Ensure Personnel Are Trained On Specific Tools--Inspect Tools Before Each Use--Make Use Of All Safety Devices And Ensure They Are Functioning--Store Tools In Proper Place--Use Correct Tool For The Job
Handling Heavy Objects/Material	Distribute Loads Evenly--Use Buddy System For Heavy, Awkward Loads--Use Proper Lifting Techniques--Utilize Proper Hoisting/Material Handling Techniques and/or Equipment--Wear appropriate PPE And Keep Guards In Place
Struck By/Against Heavy Equipment	Equipped With Back-Up Alarm/Seatbelt--Inspect Equipment Regularly--Only Qualified employees will be authorized to a operate Heavy equipment--Restrict Pedestrian Traffic--Approach Equipment Within The Operators View
Walking/Working Surface	Good Housekeeping Practices--Keep Walkways And Work Areas Clear Of Hoses, Cords, And Clutter--Restrict Site To Essential Personnel--Wear Appropriate Safety Shoes

Equipment Used	Inspection requirements	Training Requirements
Level D PPE Hand/Power Tools	Daily Safety Inspection Inspect tools/equipment before use Inspect PPE before use	40-Hour HAZWOPER Training 8-Hour HAZWOPER Supervisor (as required) Project Site Specific Training First Aid/CPR Training (as required)

ACTIVITY HAZARD ANALYSIS

Project:	**Griffiss AFB – Landfill 5**	DATE:	**December 14, 2001**
Activity:	**Clearing and Grubbing**	AHA NUMBER:	**GAFB-003**

Potential Safety/Health Hazard	Recommended Controls
Biological (i.e. Plant/Insect/Snake/Infectious Material)	Avoid insect nest or likely habitats of snakes and Use tick and insect repellant--Check skin and clothing for tick periodically throughout the day--Wear Appropriate Personal Protection Equipment
Contact With Sharp Objects/Material	Identify And Guard Sharp/Protruding Objects (I.E., Rebar Caps)--Use Caution And Be Aware Whenever Working Around Sharp Objects--Wear Appropriate Personal Protection Equipment (I.E., Gloves)
Ordinance and Explosive/Unexploded Ordnance	***IF YOU DID NOT DROP IT, DO NOT PICK IT UP!*** - After identifying potential UXO, do not move any closer to it - Do not attempt to remove any object on, attached to, or near a UXO - If possible, mark the UXO hazard -- Leave the UXO hazard area - immediately reported to SSHO
Chemical Spill during refueling operations or general equipment maintenance	Good Housekeeping Practices--Maintain Spill Response Equipment--Practice Spill Prevention at ALL Times--Proper Chemical Storage--Spill Control And Countermeasures Plan In Place For Spills Encountered During Work Activities
Exposure To High Noise Levels	Wear Appropriate Personal Protection Equipment (I.E., Ear Plugs/Muffs)--Instruct Personnel On Use Of Hearing Protection--Employees On Hearing Conservation Program
Exposure To High/Low Ambient Temperatures	Discuss Signs/Symptoms Of Heat/Cold Stress--Drink Cool/Warm Liquids, As Appropriate--Monitor Temperature
Flying Debris	Ensure guards are installed and working on tools/equipment--Initiate Dust Control Measures--Wear Appropriate Personal Protection Equipment (I.E., Safety glasses/goggles/face shields)
Drum Handling Activities	Follow drum handling/sampling procedures--DO NOT disturb Bulging drums--Perform air monitoring -- Use mechanical lifting equipment to handle drums (slings/grapplers)—use non-sparking tools to open/sample drums--Use Level B Personal Protective equipment when handling unknown drum. Secure area around drum handling activities
Hand/Power Tools	Ensure Personnel Are Trained On Specific Tools--Inspect Tools Before Each Use--Make Use Of All Safety Devices And Ensure They Are Functioning--Store Tools In Proper Place--Use Correct Tool For The Job
Handling Heavy Objects/Material	Distribute Loads Evenly--Use Buddy System For Heavy, Awkward Loads--Use Proper Lifting Techniques--Utilize Proper Hoisting/Material Handling Techniques and/or Equipment--Wear appropriate PPE And Keep Guards In Place
Struck By/Against Heavy Equipment	Equipped With Back-Up Alarm/Seatbelt--Inspect Equipment Regularly--Only Qualified employees will be authorized to a operate Heavy equipment--Restrict Pedestrian Traffic--Approach Equipment Within The Operators View

ACTIVITY HAZARD ANALYSIS

Walking/Working Surface	Good Housekeeping Practices--Keep Walkways And Work Areas Clear Of Hoses, Cords, And Clutter--Restrict Site To Essential Personnel--Wear Appropriate Safety Shoes

Equipment Used	Inspection requirements	Training Requirements
Air Monitoring instrument Level D PPE Hand/Power Tools Chain Saw Chaps	Daily Safety Inspection Inspect tools/equipment before use Calibrate air monitoring instrument before/after use Inspect PPE before use	40-Hour HAZWOPER Training 8-Hour HAZWOPER Supervisor (as required) Project Site Specific Training First Aid/CPR Training (as required) PPE Training (specialized equipment)

ACTIVITY HAZARD ANALYSIS

Project:	**Griffiss AFB – Landfill 5**	DATE:	**December 14, 2001**
Activity:	**Site Surveying**	AHA NUMBER:	**GAFB-004**

Potential Safety/Health Hazard	Recommended Controls
Biological (i.e. Plants, Insects, Snake, and Infectious Material)	Avoid insect nest or likely habitats of snakes and Use tick and insect repellant--Check skin and clothing for tick periodically throughout the day
Contact With Sharp Objects/Material	Identify And Guard Sharp/Protruding Objects (I.E., Rebar Caps)--Use Caution And Be Aware Whenever Working Around Sharp Objects--Wear Appropriate Personal Protection Equipment (I.E., Gloves)
Exposure To High/Low Ambient Temperatures	Discuss Signs/Symptoms Of Heat/Cold Stress--Drink Cool/Warm Liquids, As Appropriate--Monitor Temperature
Hand/Power Tools	Ensure Personnel Are Trained On Specific Tools--Inspect Tools Before Each Use--Make Use Of All Safety Devices And Ensure They Are Functioning--Store Tools In Proper Place--Use Correct Tool For The Job
Handling Heavy Objects/Material	Distribute Loads Evenly--Use Buddy System For Heavy, Awkward Loads--Use Proper Lifting Techniques--Utilize Proper Hoisting/Material Handling Techniques and/or Equipment--Wear appropriate PPE And Keep Guards In Place
Walking/Working Surface	Good Housekeeping Practices--Keep Walkways And Work Areas Clear Of Hoses, Cords, And Clutter--Restrict Site To Essential Personnel--Wear Appropriate Safety Shoes
Caught In/Between Moving Parts	Backup Alarm On Moving/Swinging Equipment--Identify Or Post Areas Where Guarding Is Not Feasible--Inspect and Ensure All Guards Are In Place--Swing Radius Of equipment Identified and Barricaded

Equipment Used	Inspection requirements	Training Requirements
Level D PPE Hand/Power Tools	Daily Safety Inspection Inspect tools/equipment before use Inspect PPE before use.	40-Hour HAZWOPER Training 8-Hour HAZWOPER Supervisor (as required) Project Site Specific Training First Aid/CPR Training (as required)

ACTIVITY HAZARD ANALYSIS

Project: **Griffiss AFB – Landfill 5** DATE: **December 14, 2001**

Activity: **Topsoil Stripping & Stockpiling** AHA NUMBER: **GAFB-005**

Potential Safety/Health Hazard	Recommended Controls
Chemical Spill during refueling operations or general equipment maintenance	Good Housekeeping Practices--Maintain Spill Response Equipment--Practice Spill Prevention at ALL Times--Proper Chemical Storage--Spill Control And Countermeasures Plan In Place For Spills Encountered During Work Activities
Contact With Sharp Objects/Material	Identify And Guard Sharp/Protruding Objects (I.E., Rebar Caps)--Use Caution And Be Aware Whenever Working Around Sharp Objects--Wear Appropriate Personal Protection Equipment (I.E., Gloves)
Ordinance and Explosive/Unexploded Ordnance	***IF YOU DID NOT DROP IT, DO NOT PICK IT UP!*** - After identifying potential UXO, do not move any closer to it - Do not attempt to remove any object on, attached to, or near a UXO - If possible, mark the UXO hazard -- Leave the UXO hazard area - immediately reported to SSHO
Exposure To High Noise Levels	Wear Appropriate Personal Protection Equipment (I.E., Ear Plugs/Muffs)--Instruct Personnel On Use Of Hearing Protection--Employees On Hearing Conservation Program
Drum Handling Activities	Follow drum handling/sampling procedures--DO NOT disturb Bulging drums--Perform air monitoring -- Use mechanical lifting equipment to handle drums (slings/grapplers)—use non-sparking tools to open/sample drums--Use Level B Personal Protective equipment when handling unknown drum. Secure area around drum handling activities
Exposure To High/Low Ambient Temperatures	Discuss Signs/Symptoms Of Heat/Cold Stress--Drink Cool/Warm Liquids, As Appropriate--Monitor Temperature--Monitor Work And Adjust Work-Rest Regimen--Physiological Monitoring Of Workers
Inhalation/Contact With Hazardous Material	Ensure site personnel have the appropriate HAZWOPER, Medical Clearance and Site Specific Training--Follow Decontamination Procedures--Follow Emergency Contingency Procedures--Implement Site Controls Areas--Perform Dust/Vapor Suppression--Perform Real-Time Air Monitoring--Review Material Safety data Sheet--Wear appropriate PPE for Task/Activity Performed
Struck By/Against Heavy Equipment	Approach Equipment Within The Operators View--Equipment Properly Secured When Not In Use--Equipped With Back-Up Alarm/Seatbelt--Flaggers/Spotters Assigned Where Necessary--Hand Signal By DESIGNATED Worker--Inspect Equipment Regularly--Keep Heavy Equipment At Least 10 Feet From Power Lines--Only Qualified employees will be authorized to a operate Heavy equipment--Restrict Pedestrian Traffic--Swing Radius Roped Off Or Guarded--Use Safety Reflective Vest When Working Around Equipment

ACTIVITY HAZARD ANALYSIS

Walking/Working Surface	Avoid Walking On Spoils Pile and Watch Footing When Entering Excavation--Good Housekeeping Practices--Barricade Open Excavations--Keep Walkways And Work Areas Clear Of Hoses, Cords, And Clutter--Restrict Site To Essential Personnel--Wear Appropriate Safety Shoes

Equipment Used	Inspection requirements	Training Requirements
Air Monitoring instrument Level D Hand/Power Tools Excavators/Dozer	Daily Safety Inspection Inspect tools/equipment before use Calibrate air monitoring instrument before/after use Inspect PPE before use	40-Hour HAZWOPER Training 8-Hour HAZWOPER Supervisor (as required) Project Site Specific Training First Aid/CPR Training (as required)

ACTIVITY HAZARD ANALYSIS

Project:	**Griffiss AFB – Landfill 5**	DATE:	**December 14, 2001**
Activity:	**Site Grading (Cut/Fill)**	AHA NUMBER:	**GAFB-006**

Potential Safety/Health Hazard	Recommended Controls
Chemical Spill during refueling operations or general equipment maintenance	Good Housekeeping Practices--Maintain Spill Response Equipment--Practice Spill Prevention at ALL Times--Proper Chemical Storage--Spill Control And Countermeasures Plan In Place For Spills Encountered During Work Activities
Ordinance and Explosive/Unexploded Ordnance	***IF YOU DID NOT DROP IT, DO NOT PICK IT UP!*** - After identifying potential UXO, do not move any closer to it - Do not attempt to remove any object on, attached to, or near a UXO - If possible, mark the UXO hazard -- Leave the UXO hazard area - immediately reported to SSHO
Inhalation/Contact With Hazardous Material	Ensure site personnel have the appropriate HAZWOPER, Medical Clearance and Site Specific Training--Follow Decontamination Procedures--Follow Emergency Contingency Procedures--Implement Site Controls Areas--Perform Dust/Vapor Suppression--Perform Real-Time Air Monitoring--Review Material Safety data Sheet--Wear appropriate PPE for Task/Activity Performed
Exposure To High Noise Levels	Employees On Hearing Conservation Program--Instruct Personnel On Use Of Hearing Protection--Wear Appropriate Personal Protection Equipment (I.E., Ear Plugs/Muffs)
Exposure To High/Low Ambient Temperatures	Discuss Signs/Symptoms Of Heat/Cold Stress--Drink Cool/Warm Liquids, As Appropriate--Monitor Temperature--Monitor Work And Adjust Work-Rest Regimen--Physiological Monitoring Of Workers
Drum Handling Activities	Follow drum handling/sampling procedures--DO NOT disturb Bulging drums--Perform air monitoring -- Use mechanical lifting equipment to handle drums (slings/grapplers)—use non-sparking tools to open/sample drums--Use Level B Personal Protective equipment when handling unknown drum. Secure area around drum handling activities
Hand/Power Tools	Ensure Personnel Are Trained On Specific Tools--Inspect Tools Before Each Use--Make Use Of All Safety Devices And Ensure They Are Functioning--Store Tools In Proper Place--Use Correct Tool For The Job
Struck By/Against Heavy Equipment	Approach Equipment Within The Operators View--Equipment Properly Secured When Not In Use--Equipped With Back-Up Alarm/Seatbelt--Flaggers/Spotters Assigned Where Necessary--Hand Signal By DESIGNATED Worker--Inspect Equipment Regularly--Keep Heavy Equipment At Least 10 Feet From Power Lines--Only Qualified employees will be authorized to a operate Heavy equipment--Restrict Pedestrian Traffic--Swing Radius Roped Off Or Guarded--Use Safety Reflective Vest When Working Around Equipment

ACTIVITY HAZARD ANALYSIS

Walking/Working Surface	Avoid Walking On Spoils Pile and Watch Footing When Entering Excavation----Keep Walkways And Work Areas Clear Of Hoses, Cords, And Clutter--Restrict Site To Essential Personnel--Wear Appropriate Safety Shoes

Equipment Used	Inspection requirements	Training Requirements
Air Monitoring instrument Level D PPE Hand/Power Tools	Daily Safety Inspection Inspect tools/equipment before use Calibrate air monitoring instrument before/after use Inspect PPE before use	40-Hour HAZWOPER Training 8-Hour HAZWOPER Supervisor (as required) Project Site Specific Training First Aid/CPR Training (as required)

ACTIVITY HAZARD ANALYSIS

Project:	**Griffiss AFB – Landfill 5**	DATE:	**December 14, 2001**
Activity:	**Installation of Cover System**	AHA NUMBER:	**GAFB-007**

Potential Safety/Health Hazard	Recommended Controls
Chemical Spill during refueling operations or general equipment maintenance	Good Housekeeping Practices--Maintain Spill Response Equipment--Practice Spill Prevention at ALL Times--Proper Chemical Storage--Spill Control And Countermeasures Plan In Place For Spills Encountered During Work Activities
Contact With Sharp Objects/Material	Identify And Guard Sharp/Protruding Objects (I.E., Rebar Caps)--Use Caution And Be Aware Whenever Working Around Sharp Objects--Wear Appropriate Personal Protection Equipment (I.E., Gloves)
Exposed To Vehicle Traffic	Develop, Implement and Follow Traffic Control Plan--Flaggers/Spotters Assigned Where Necessary--Use Safety Reflective Vest When Working Around Active Traffic
Exposure To High Noise Levels	Wear Appropriate Personal Protection Equipment (I.E., Ear Plugs/Muffs)--Instruct Personnel On Use Of Hearing Protection--Employees On Hearing Conservation Program
Exposure To High/Low Ambient Temperatures	Discuss Signs/Symptoms Of Heat/Cold Stress--Drink Cool/Warm Liquids, As Appropriate--Monitor Temperature--Monitor Work And Adjust Work-Rest Regimen--Physiological Monitoring Of Workers
Inhalation/Contact With Hazardous Material	Ensure site personnel have the appropriate HAZWOPER, Medical Clearance and Site Specific Training--Follow Decontamination Procedures--Follow Emergency Contingency Procedures--Implement Site Controls Areas--Perform Dust/Vapor Suppression--Perform Real-Time Air Monitoring--Review Material Safety data Sheet--Wear appropriate PPE for Task/Activity Performed
Struck By/Against Heavy Equipment	Approach Equipment Within The Operators View--Equipment Properly Secured When Not In Use--Equipped With Back-Up Alarm/Seatbelt--Flaggers/Spotters Assigned Where Necessary--Hand Signal By DESIGNATED Worker--Inspect Equipment Regularly--Keep Heavy Equipment At Least 10 Feet From Power Lines--Only Qualified employees will be authorized to a operate Heavy equipment--Restrict Pedestrian Traffic--Swing Radius Roped Off Or Guarded--Use Safety Reflective Vest When Working Around Equipment
Walking/Working Surface	Avoid Walking On Spoils Pile and Watch Footing When Entering Excavation--Good Housekeeping Practices--Barricade Open Excavations--Keep Walkways And Work Areas Clear Of Hoses, Cords, And Clutter--Restrict Site To Essential Personnel--Wear Appropriate Safety Shoes

Equipment Used	Inspection requirements	Training Requirements
Air Monitoring instrument Level D Hand/Power Tools Excavators/Dozer	Daily Safety Inspection Inspect tools/equipment before use Calibrate air monitoring instrument before/after use Inspect PPE before use	40-Hour HAZWOPER Training 8-Hour HAZWOPER Supervisor (as required) Project Site Specific Training First Aid/CPR Training (as [illegible])

ACTIVITY HAZARD ANALYSIS

Project:	**Griffiss AFB – Landfill 5**	DATE:	**December 14, 2001**
Activity:	**Equipment Decontamination**	AHA NUMBER:	**GAFB-008**

Potential Safety/Health Hazard	Recommended Controls
Caught In/Between Moving Parts	Backup Alarm On Moving/Swinging Equipment--Identify Or Post Areas Where Guarding Is Not Feasible--Inspect and Ensure All Guards Are In Place--Swing Radius Of equipment Identified and Barricaded
Contact With Sharp Objects/Material	Identify And Guard Sharp/Protruding Objects (I.E., Rebar Caps)--Use Caution And Be Aware Whenever Working Around Sharp Objects--Wear Appropriate Personal Protection Equipment (I.E., Gloves)
Inhalation/Contact With Hazardous Material	Ensure site personnel have the appropriate HAZWOPER, Medical Clearance and Site Specific Training--Follow Decontamination Procedures--Follow Emergency Contingency Procedures--Implement Site Controls Areas--Perform Dust/Vapor Suppression--Perform Real-Time Air Monitoring--Review Material Safety data Sheet--Wear appropriate PPE for Task/Activity Performed
Exposure To High Noise Levels	Employees On Hearing Conservation Program--Instruct Personnel On Use Of Hearing Protection--Wear Appropriate Personal Protection Equipment (I.E., Ear Plugs/Muffs)
Exposure To High/Low Ambient Temperatures	Discuss Signs/Symptoms Of Heat/Cold Stress--Drink Cool/Warm Liquids, As Appropriate--Monitor Temperature--Monitor Work And Adjust Work-Rest Regimen--Physiological Monitoring Of Workers
Hand/Power Tools	Ensure Personnel Are Trained On Specific Tools--Inspect Tools Before Each Use--Make Use Of All Safety Devices And Ensure They Are Functioning--Store Tools In Proper Place--Use Correct Tool For The Job
Handling Heavy Objects/Material	Distribute Loads Evenly--Plan Ahead When Moving Materials/Items--Use Buddy System For Heavy, Awkward Loads--Use Proper Lifting Techniques--Utilize Proper Hoisting/Material Handling Techniques and/or Equipment--Wear appropriate PPE And Keep Guards In Place

Equipment Used	Inspection requirements	Training Requirements
Level D PPE Modified Hand/Power Tools	Daily Safety Inspection Inspect tools/equipment before use Calibrate air monitoring instrument before/after use Inspect PPE before use	40-Hour HAZWOPER Training 8-Hour HAZWOPER Supervisor (as required) Project Site Specific Training First Aid/CPR Training (as required)

ACTIVITY HAZARD ANALYSIS

Project: **Griffiss AFB – Landfill 5** DATE: **December 14, 2001**

Activity: **Monitoring Well Decommissioning** AHA NUMBER: **GAFB-009**

Potential Safety/Health Hazard	Recommended Controls
Caught In/Between Moving Parts	Backup Alarm On Moving/Swinging Equipment--Identify Or Post Areas Where Guarding Is Not Feasible--Inspect and Ensure All Guards Are In Place--Swing Radius Of equipment Identified and Barricaded
Contact With Sharp Objects/Material	Identify And Guard Sharp/Protruding Objects (I.E., Rebar Caps)--Use Caution And Be Aware Whenever Working Around Sharp Objects--Wear Appropriate Personal Protection Equipment (I.E., Gloves)
Inhalation/Contact With Hazardous Material	Ensure site personnel have the appropriate HAZWOPER, Medical Clearance and Site Specific Training--Follow Decontamination Procedures--Follow Emergency Contingency Procedures--Implement Site Controls Areas--Perform Dust/Vapor Suppression--Perform Real-Time Air Monitoring--Review Material Safety data Sheet--Wear appropriate PPE for Task/Activity Performed
Exposure To High Noise Levels	Employees On Hearing Conservation Program--Instruct Personnel On Use Of Hearing Protection--Wear Appropriate Personal Protection Equipment (I.E., Ear Plugs/Muffs)
Exposure To High/Low Ambient Temperatures	Discuss Signs/Symptoms Of Heat/Cold Stress--Drink Cool/Warm Liquids, As Appropriate--Monitor Temperature--Monitor Work And Adjust Work-Rest Regimen--Physiological Monitoring Of Workers
Hand/Power Tools	Ensure Personnel Are Trained On Specific Tools--Inspect Tools Before Each Use--Make Use Of All Safety Devices And Ensure They Are Functioning--Store Tools In Proper Place--Use Correct Tool For The Job
Handling Heavy Objects/Material	Distribute Loads Evenly--Plan Ahead When Moving Materials/Items--Use Buddy System For Heavy, Awkward Loads--Use Proper Lifting Techniques--Utilize Proper Hoisting/Material Handling Techniques and/or Equipment--Wear appropriate PPE And Keep Guards In Place
Walking/Working Surface	Avoid Walking On Spoils Pile and Watch Footing When Entering Excavation----Keep Walkways And Work Areas Clear Of Hoses, Cords, And Clutter--Restrict Site To Essential Personnel--Wear Appropriate Safety Shoes

Equipment Used	Inspection requirements	Training Requirements
Level D PPE Modified Hand/Power Tools	Daily Safety Inspection Inspect tools/equipment before use Calibrate air monitoring instrument before/after use Inspect PPE before use	40-Hour HAZWOPER Training 8-Hour HAZWOPER Supervisor (as required) Project Site Specific Training First Aid/CPR Training (as required)

ACTIVITY HAZARD ANALYSIS

Project: **Griffiss AFB – Landfill 5** DATE: **December 14, 2001**

Activity: **Site Restoration/Demobilization** AHA NUMBER: **GAFB-010**

Potential Safety/Health Hazard	Recommended Controls
Caught In/Between Moving Parts	Swing Radius Roped Off Or Guarded--Restrict Pedestrian Traffic--Backup Alarm On Moving/Swinging Equipment--Identify Or Post Areas Where Guarding Is Not Feasible--Inspect and Ensure All Guards Are In Place
Chemical Spill during refueling operations or general equipment maintenance	Good Housekeeping Practices--Maintain Spill Response Equipment--Practice Spill Prevention at ALL Times--Proper Chemical Storage--Spill Control And Countermeasures Plan In Place For Spills Encountered During Work Activities
Contact With Sharp Objects/Material	Identify And Guard Sharp/Protruding Objects (I.E., Rebar Caps)--Use Caution And Be Aware Whenever Working Around Sharp Objects--Wear Appropriate Personal Protection Equipment (I.E., Gloves)
Exposed To Vehicle Traffic	Develop, Implement and Follow Traffic Control Plan--Flaggers/Spotters Assigned Where Necessary--Use Safety Reflective Vest When Working Around Active Traffic
Exposure To High Noise Levels	Wear Appropriate Personal Protection Equipment (I.E., Ear Plugs/Muffs)--Instruct Personnel On Use Of Hearing Protection--Employees On Hearing Conservation Program
Exposure To High/Low Ambient Temperatures	Discuss Signs/Symptoms Of Heat/Cold Stress--Drink Cool/Warm Liquids, As Appropriate--Monitor Temperature
Hand/Power Tools	Ensure Personnel Are Trained On Specific Tools--Inspect Tools Before Each Use--Use Correct Tool For The Job--Make Use Of All Safety Devices And Ensure They Are Functioning
Handling Heavy Objects/Material	Use Proper Lifting Techniques--Utilize Proper Hoisting/Material Handling Techniques and/or Equipment--Use Buddy System For Heavy, Awkward Loads--Distribute Loads Evenly
Struck By/Against Heavy Equipment	Only Qualified employees will be authorized to a operate Heavy equipment--Approach Equipment Within The Operators View--Equipped With Back-Up Alarm/Seatbelt--Inspect Equipment Regularly--Hand Signal By DESIGNATED Worker
Walking/Working Surface	Good Housekeeping Practices--Keep Walkways And Work Areas Clear Of Hoses, Cords, And Clutter--Restrict Site To Essential Personnel--Wear Appropriate Safety Shoes

Equipment Used	Inspection requirements	Training Requirements
Air Monitoring instrument Level D PPE Hand/Power Tools Ladders Trucks	Daily Safety Inspection Inspect tools/equipment before use Calibrate air monitoring instrument before/after use Inspect PPE before use	40-Hour HAZWOPER Training 8-Hour HAZWOPER Supervisor (as required) FT. Indiantown Gap Site Specific Training First Aid/CPR Training (as required)

ATTACHMENT 2
MATERIAL SAFETY DATA SHEETS

Material Safety Data Sheet Collection
Genium Publishing Corp.
1171 RiverFront Center
Amsterdam, NY 12010
(518) 842-4111

Issue Date: 2001-06

Section 1 - Chemical Product and Company Identification 55

Material Name: Benz[a]anthracene **CAS Number:** 56-55-3
Chemical Formula: $C_{18}H_{12}$
Synonyms: B(A)A; BA; BAA; 1,2-BENZ(A)ANTHRACENE; 1,2-BENZANTHRACENE; BENZ(A)ANTHRACENE; BENZANTHRACENE; BENZ[A]ANTHRACENE; 1,2-BENZANTHRAZEN; 1,2-BENZANTHRENE; BENZANTHRENE; 1,2-BENZOANTHRACENE; BENZO(A)ANTHRACENE; BENZOANTHRACENE; 2,3-BENZOPHENANTHRENE; BENZO(A)PHENANTHRENE; BENZO(B)PHENANTHRENE; 2,3-BENZPHENANTHRENE; NAPHTHANTHRACENE; TETRAPHENE
General Use: research chemistry

Section 2 - Composition / Information on Ingredients

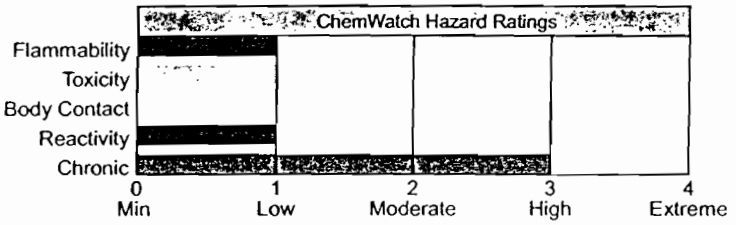
Name	CAS	%
benz[a]anthracene	56-55-3	>98

OSHA PEL
No data found.

NIOSH REL
No data found.

ACGIH TLV
No data found.

Section 3 - Hazards Identification



ANSI Signal Word
Danger!


Poison

☆☆☆☆☆ Emergency Overview ☆☆☆☆☆
Colorless plates. May cause irritation. Poison. Other Acute Effects: may be fatal if inhaled, swallowed, or absorbed through skin. Chronic Effects: may cause heritable genetic damage; may alter genetic material. Carcinogen. Will burn.

Potential Health Effects

Target Organs: No data found.
Primary Entry Routes: accidental skin and eye contact, inhalation of generated dusts
Acute Effects
Inhalation: The dust is harmful and discomforting to the upper respiratory tract. Persons with impaired respiratory function, airway diseases, or conditions such as emphysema or chronic bronchitis may incur further disability if excessive concentrations of particulate are inhaled.
Eye: The dust may be discomforting to the eyes and is capable of causing a mild, temporary redness of the conjunctiva (similar to wind-burn), temporary impairment of vision and/ or other transient eye damage/ ulceration.
Skin: The material may be mildly discomforting to the skin. Open cuts and abraded or irritated skin should not be exposed to this material. Toxic effects may result from skin absorption.
Ingestion: The solid/dust is discomforting to the gastrointestinal tract and harmful if swallowed. Considered an unlikely route of entry in commercial/industrial environments.
Carcinogenicity: NTP - Class 2B, Reasonably anticipated to be a carcinogen, sufficient evidence of carcinogenicity from studies in experimental animals; IARC - Group 2A, Probably carcinogenic to humans; OSHA - Not listed; NIOSH - Not listed; ACGIH - Class A2, Suspected human carcinogen; EPA - Class B2, Probable human carcinogen based on animal studies; MAK - Class A2, Unmistakably carcinogenic in animal experimentation only.

Chronic Effects: Cited in many publications and by a number of regulatory authorities as a suspected human carcinogen. Subcutaneous injection produces sarcomas (soft tissue growths) in rats and mice. When administered by gavage benz[a]anthracene induced papillomas to the forestomach in mice and hamsters and mammary tumors in female rats.

Section 4 - First Aid Measures

Inhalation: • If dust is inhaled, remove to fresh air.
• Encourage patient to blow nose to ensure clear breathing passages.
• Rinse mouth with water. Consider drinking water to remove dust from throat.
• Seek medical attention if irritation or discomfort persist.
• If fumes or combustion products are inhaled, remove to fresh air.
• Lay patient down. Keep warm and rested.
• Other measures are usually unnecessary.

Eye Contact: • Immediately hold the eyes open and flush with fresh running water.
• Ensure complete irrigation of the eye by keeping eyelids apart and away from eye and moving the eyelids by occasionally lifting the upper and lower lids.
• Seek medical attention if pain persists or recurs.
• Removal of contact lenses after an eye injury should only be undertaken by skilled personnel.

Skin Contact: • Immediately remove all contaminated clothing, including footwear (after rinsing with water).
• Wash affected areas thoroughly with water (and soap if available).
• Seek medical attention in event of irritation.

Ingestion: Contact a Poison Control Center. If more than 15 minutes from a hospital:
• INDUCE vomiting with IPECAC SYRUP, or fingers down the back of the throat, ONLY IF CONSCIOUS. Lean patient forward or place on left side (head-down position, if possible) to maintain open airway and prevent aspiration. NOTE: Wear a protective glove when inducing vomiting by mechanical means.
• SEEK MEDICAL ATTENTION WITHOUT DELAY.
• In the meantime, qualified first-aid personnel should treat the patient following observation and employing supportive measures as indicated by the patient's condition.
• If the services of a medical officer or medical doctor are readily available, the patient should be placed in his/her care and a copy of the MSDS should be provided.
• If medical attention is not available on the worksite or surroundings send the patient to a hospital together with a copy of the MSDS.

After first aid, get appropriate in-plant, paramedic, or community medical support.

Note to Physicians: Treat symptomatically.

Section 5 - Fire-Fighting Measures

Flash Point: Not available; probably combustible

Extinguishing Media: Foam. Dry chemical powder. BCF (where regulations permit). Carbon dioxide. Water spray or fog - Large fires only.

General Fire Hazards/Hazardous Combustion Products: • Solid which exhibits difficult combustion or is difficult to ignite.
• Avoid generating dust, particularly clouds of dust in a confined or unventilated space, as dust may form an explosive mixture with air and any source of ignition, e.g., flame or spark, will cause fire or explosion.
• Dry dust can also be charged electrostatically by turbulence, pneumatic transport, pouring, in exhaust ducts and during transport.
• Build-up of electrostatic charge may be prevented by bonding and grounding.
• Powder handling equipment such as dust collectors, dryers and mills may require additional protection measures such as explosion venting.

Fire Incompatibility: Avoid contamination with oxidizing agents i.e., nitrates, oxidizing acids, chlorine bleaches, pool chlorine etc. as ignition may result.

Fire-Fighting Instructions: • Contact fire department and tell them location and nature of hazard.
• Wear breathing apparatus plus protective gloves for fire only.
• Prevent, by any means available, spillage from entering drains or waterways.
• Use fire fighting procedures suitable for surrounding fire.
• Do not approach containers suspected to be hot.
• Cool fire-exposed containers with water spray from a protected location.
• If safe to do so, remove containers from path of fire.
• Equipment should be thoroughly decontaminated after use.

Section 6 - Accidental Release Measures

Small Spills: • Clean up all spills immediately.
• Avoid contact with skin and eyes.

- Wear protective clothing, gloves, safety glasses and dust respirator.
- Use dry clean up procedures and avoid generating dust.
- Vacuum up or sweep up.
- Place in clean drum then flush area with water.

Large Spills: • Clear area of personnel and move upwind.
- Contact fire department and tell them location and nature of hazard.
- Wear breathing apparatus plus protective gloves.
- Prevent, by any means available, spillage from entering drains or waterways.
- No smoking, bare lights or ignition sources.
- Increase ventilation.
- Stop leak if safe to do so.
- Water spray or fog may be used to disperse/absorb vapor.
- Contain or absorb spill with sand, earth or vermiculite.
- Collect recoverable product into labeled containers for recycling.
- Collect solid residues and seal in labeled drums for disposal.
- Wash area and prevent runoff into drains.
- After clean up operations, decontaminate and launder all protective clothing and equipment before storing and reusing.
- If contamination of drains or waterways occurs, advise emergency services.

Regulatory Requirements: Follow applicable OSHA regulations (29 CFR 1910.120).

Section 7 - Handling and Storage

Handling Precautions: • Avoid all personal contact, including inhalation.
- Wear protective clothing when risk of overexposure occurs.
- Use in a well-ventilated area.
- Prevent concentration in hollows and sumps.
- DO NOT enter confined spaces until atmosphere has been checked.
- Do not allow material to contact humans, exposed food or food utensils.
- Avoid smoking, bare lights or ignition sources.
- When handling, DO NOT eat, drink or smoke.
- Avoid contact with incompatible materials.
- Keep containers securely sealed when not in used.
- Avoid physical damage to containers.
- Always wash hands with soap and water after handling.
- Working clothes should be laundered separately. Launder contaminated clothing before reuse.
- Follow good occupational work practices.
- Observe manufacturer's storage/handling recommendations.
- Atmosphere should be regularly checked against established exposure standards to ensure safe working conditions are maintained.

Recommended Storage Methods: Glass container. Plastic container. Metal can. Metal drum. Check that all containers are clearly labeled and free from leaks.

Regulatory Requirements: Follow applicable OSHA regulations.

Section 8 - Exposure Controls / Personal Protection

Engineering Controls: Local exhaust ventilation usually required. If risk of overexposure exists, wear NIOSH-approved respirator. Provide adequate ventilation in warehouse or closed storage area.

Personal Protective Clothing/Equipment

Eyes: Safety glasses with side shields or chemical goggles. Contact lenses pose a special hazard; soft lenses may absorb irritants and all lenses concentrate them.

Hands/Feet: Wear chemical protective gloves, e.g. PVC. Wear safety footwear.

Other: • Overalls.
- PVC Apron.
- PVC protective suit may be required if exposure severe.
- Eyewash unit.
- Ensure there is ready access to a safety shower.

Section 9 - Physical and Chemical Properties

Appearance/General Info: Light yellow to tan crystalline powder.

Physical State: colorless plates

Vapor Pressure (kPa): 5 x10^{9} torr at 20 °C

Formula Weight: 228.29

Water Solubility: 0.014 mg/L in Water at 25 °C

Evaporation Rate: Half life 89 hours

Boiling Point Range: Sublimes at 435 °C (815 °F)

Freezing/Melting Point Range: 162 °C (323.6 °F)

Volatile Component (% Vol): Negligible

Section 10 - Stability and Reactivity

Stability/Polymerization/Conditions to Avoid: Product is considered stable. Hazardous polymerization will not occur.
Storage Incompatibilities: Avoid reaction with oxidizing agents.

Section 11 - Toxicological Information

Toxicity
Intravenous (rat) LD_{50}: > 200 mg/kg

Irritation
Nil reported

See NIOSH, *RTECS* CV9275000, for additional data.

Section 12 - Ecological Information

Environmental Fate: When released into water it will rapidly become adsorbed to sediment or particulate matter in the water column, and bioconcentrate into aquatic organisms. In the unadsorbed state, it will degrade by photolysis in a matter of hours to days. Its slow desorption from sediment and particulate matter will maintain a low concentration in the water. Because it is strongly adsorbed to soil it will remain in the upper few centimeters of soil and not leach into groundwater. It will very slowly biodagrade when colonies of microorganisms are acclimated but this is too slow a process (half-life ca 1 year to be significant). In the atmosphere it will be transported long distances and will probably be subject to photolysis and photooxidation although there is little documentation about the rate of these processes in the literature.
Ecotoxicity: Algae: Anabaena flos-aquae 2w EC_{50} growth +0.014 mg/l NOEC growth +0.003 mg/l
BCF: daphnia 4.0
Octanol/Water Partition Coefficient: log K_{ow} = 5.61
Soil Sorption Partition Coefficient: K_{oc} = sediments 55 to 1.87 x 10^6

Section 13 - Disposal Considerations

Disposal: • Recycle wherever possible or consult manufacturer for recycling options.
• Follow applicable local, state, and federal regulations.
• Bury residue in an authorized landfill.
• Recycle containers if possible, or dispose of in an authorized landfill.

Section 14 - Transport Information

DOT Transportation Data (49 CFR 172.101):

Shipping Name: TOXIC SOLID, ORGANIC, N.O.S.
Additional Shipping Information:
Hazard Class: 6.1
ID No.: 2811
Packing Group: III
Label: Harmful[6]

Section 15 - Regulatory Information

EPA Regulations:
RCRA 40 CFR: Listed U018 Toxic Waste
CERCLA 40 CFR 302.4: Listed per RCRA Section 3001, and per CWA Section 307(a) 10 lb (4.535 kg)
SARA 40 CFR 372.65: Listed
SARA EHS 40 CFR 355: Not listed
TSCA: Listed

Section 16 - Other Information

Research Date:.....2000-11 **Review Date:** 2001-05

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Material Safety Data Sheets Collection

Benzo(a)pyrene **MSDS No. 164**

Date of Preparation: 2/94

Section 1 - Chemical Product and Company Identification 43

Product/Chemical Name: Benzo(a)pyrene
Chemical Formula: $C_{20}H_{12}$; a polynuclear aromatic hydrocarbon
CAS No.: 50-32-8
Synonyms: BaP; 3,4-benz(a)pyrene; BP; 3,4-benzopyrene; 3,4-benzpyrene. Formerly called 1,2-benzpyrene.
Derivation: Synthesized from pyrene and succinic anhydride.
General Use: Benzo(a)pyrene is no longer used or produced commercially in the US. In its pure form, benzo(a)pyrene may be used as a research laboratory reagent. It also occurs in combustion products of coal, oil, petroleum, wood and other biological matter; in motor vehicle and other gasoline and diesel engine exhaust; in charcoal-broiled foods; in cigarette smoke and general soot and smoke of industrial, municipal, and domestic origin. It occurs naturally in crude oils, shale oils, coal tars, gases and fly ash from active volcanoes and forest fires. **Vendors:** Consult the latest *Chemical Week Buyers' Guide.* (73)

Section 2 - Composition / Information on Ingredients

Benzo(a)pyrene, ca 100 %wt; except in laboratories, benzo(a)pyrene is usually mixed with other coal tar pitch chemicals. Consider exposure limits for coal tar pitch volatiles as a guideline. However, because benzo(a)pyrene is considered a probable carcinogen to humans, it is recommended that exposures to carcinogens be limited to the lowest feasible concentration.

OSHA PELs
Coal tar pitch volatiles
8-hr TWA: 0.2 mg/m^3

ACGIH TLVs
A2: Suspected Human Carcinogen

NIOSH REL
10-hr TWA: 0.1 mg/m^3
Carcinogen; coal tar pitch volatile, cyclohexane extractable fraction.

DFG (Germany) MAK
None established

IDLH Level
700 mg/m^3
Coal tar pitch volatiles (benzene soluble fraction)

Section 3 - Hazards Identification

☆☆☆☆☆ **Emergency Overview** ☆☆☆☆☆

Benzo(a)pyrene is a pale yellow, crystalline solid or powder that is irritating to the skin, eyes, and respiratory tract. It is a carcinogen and mutagen. Handle with extreme caution!

Wilson Risk Scale
R 1
I 4
S 4
K 1

HMIS
H 2*
F 1
R 0
* Chronic Effects
PPE†
†Sec. 8

Potential Health Effects

Primary Entry Routes: Inhalation, ingestion. **Target Organs:** Respiratory system, bladder, kidneys, skin.
Acute Effects: Inhalation: Respiratory tract irritation. **Eye:** Irritation and/or burns on contact. **Skin:** Irritation with burning sensation, rash, and redness; dermatitis on prolonged exposure. Sunlight enhances effects (photosensitization). **Ingestion:** None reported.
Carcinogenicity: IARC, NTP, NIOSH, ACGIH, EPA, and MAK list benzo(a)pyrene as: an IARC 2A (probably carcinogenic to humans: limited human evidence, sufficient evidence in experimental animals), an NTP-2 (reasonably anticipated to be a carcinogen: limited evidence from studies in humans or sufficient evidence from studies in experimental animals), a NIOSH-X (carcinogen defined with no further categorization); an ACGIH TLV-A2 (suspected human carcinogen: carcinogenic in experimental animals, but available epidemiological studies are conflicting or insufficient to confirm an increased risk of cancer in exposed humans); an EPA-B2 (sufficient evidence from animal studies, inadequate evidence or no data from epidemiological studies); and an MAK-A1 (capable of inducing malignant tumors as shown by experience with humans) carcinogen, respectively.
Medical Conditions Aggravated by Long-Term Exposure: Respiratory system, bladder, kidney, and skin disorders.
Chronic Effects: Inhalation: Cough and bronchitis. **Eye:** Photosensitivity and irritation. **Skin:** Skin changes such as thickening, darkening, pimples, loss of color, reddish areas, thinning of the skin, and warts. Sunlight enhances effects (photosensitization). **Other:** Gastrointestinal (GI) effects include leukoplakia (a pre-cancerous condition characterized by thickened white patches of epithelium on mucous membranes, especially of the mouth). Cancer of the lung, skin, kidneys, bladder, or GI tract is also possible. Smoking in combination with exposure to benzo(a)pyrene increases the chances of developing lung cancer. Persons with a high degree of inducibility of the enzyme aryl hydrocarbon hydroxylase may be a high risk population.
Comments: Pregnant women may be especially susceptible to exposure effects of benzo(a)pyrene; exposure may damage the fetus. In general, polyaromatic hydrocarbons such as benzo(a)pyrene tend to localize primarily in body fat and fatty tissues (for ex. breasts) and are excreted in breast milk. Benzo(a)pyrene may also affect the male reproductive system (testes and sperm).

Section 4 - First Aid Measures

Inhalation: Remove exposed person to fresh air and support breathing as needed.

Eye Contact: *Do not* allow victim to rub or keep eyes tightly shut. Gently lift eyelids and flush immediately and continuously with flooding amounts of tepid water for at least 15 min. Consult an ophthalmologist if irritation or pain persist.

Skin Contact: *Quickly* remove contaminated clothing. Rinse with flooding amounts of water (less than 15 min). Wash exposed area with soap and water. For reddened or blistered skin, consult a physician.

Ingestion: Never give anything by mouth to an unconscious or convulsing person. Contact a poison control center. Unless the poison control center advises otherwise, have the *conscious and alert* person drink 1 to 2 glasses of water to dilute. Inducing vomiting is not necessary since benzo(a)pyrene has a low acute toxicity and therefore, is generally an unnecessary procedure. Consider activated charcoal/cathartic.

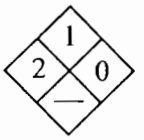
After first aid, get appropriate in-plant, paramedic, or community medical support.

Note to Physicians: Monitor CBC and arterial blood gases, conduct liver, renal, and pulmonary function tests (if respiratory tract irritation is present), and urinalysis. Biological monitoring techniques testing for metabolites in blood or urine, or DNA adducts in blood or tissues are useful for epidemiological studies that determine if exposure has occurred. Because neither normal nor toxic levels have been established, those techniques may not be useful for evaluating individual patients.

Special Precautions/Procedures: Emergency personnel should protect against exposure.

Section 5 - Fire-Fighting Measures

Genium



Flash Point: None reported. Benzo(a)pyrene may burn, but does *not* readily ignite.

Autoignition Temperature: None reported.

LEL: None reported.

UEL: None reported.

Extinguishing Media: For small fires, use dry chemical, sand, water spray, or foam. For large fires, use water spray, fog, or foam.

Unusual Fire or Explosion Hazards: None reported.

Hazardous Combustion Products: Carbon monoxide and carbon dioxide.

Fire-Fighting Instructions: Isolate hazard and deny entry. If feasible and without undue risk, move containers from fire hazard area. Otherwise, cool fire-exposed containers with water spray until well after fire is extinguished. Do not release runoff from fire control methods to sewers or waterways.

Fire-Fighting Equipment: Because fire may produce toxic thermal decomposition products, wear a self-contained breathing apparatus (SCBA) with a full facepiece operated in pressure-demand or positive-pressure mode and full protective clothing.

Section 6 - Accidental Release Measures

Spill /Leak Procedures: Notify safety personnel of large spills, remove heat and ignition sources, and provide adequate ventilation. Cleanup personnel should protect against dust inhalation and skin or eye contact. Clean up spills promptly.

Small Spills: Carefully scoop up spilled material and place into appropriate containers for disposal. For liquid spills, take up with a noncombustible, inert absorbent and place into appropriate containers for disposal.

Large Spills

Containment: For large spills, dike far ahead of liquid spill or contain dry spill for later disposal. Do not release into sewers or waterways.

Cleanup: *Do not* dry sweep! Use a vacuum with a HEPA filter or a wet method to reduce dust. After cleanup is complete, thoroughly decontaminate all surfaces. *Do not* reuse contaminated cleaning materials.

Regulatory Requirements: Follow applicable OSHA regulations (29 CFR 1910.120).

Section 7 - Handling and Storage

Handling Precautions: Handle with extreme caution and take all necessary measures to avoid exposure to benzo(a)pyrene because it is a carcinogen and mutagen. Follow good personal hygiene procedures and thoroughly wash hands with soap and water after handling. Use safety pipettes for all pipetting.

Storage Requirements: Store in tightly closed and properly labeled containers in a cool, well-ventilated area.

Section 8 - Exposure Controls / Personal Protection

Engineering Controls: Use a Class I, Type B, biological safety hood when working with benzo(a)pyrene in a laboratory. Decrease the rate of air extraction, so that benzo(a)pyrene can be handled without powder being blown around the hood. Keep glove boxes under negative pressure. Use vertical laminar-flow, 100% exhaust, biological safety cabinets for containment of in vitro procedures. The exhaust air flow should be sufficient to provide an inward air flow at the face opening of the cabinet. Ensure contaminated air sheaths that are under positive pressure are leak-tight. Never use horizontal laminar-flow hoods or safety cabinets where filtered air is blown across the working area towards the operator. Test cabinets before work begins to ensure they are functioning properly.

Ventilation: Provide general or local exhaust ventilation systems to maintain airborne concentrations as low as possible. Local exhaust ventilation is preferred because it prevents contaminant dispersion into the work area by controlling it at its source.[103]

Administrative Controls: Consider preplacement and periodic medical examinations with emphasis on the oral cavity, bladder, kidneys, skin, and respiratory tract. Conduct urinalysis including specific gravity, albumin, glucose, and microscopic examination of centrifuged sediment for red blood cells. Also, include 14" x 17" chest roentgenogram, FVC + FEV_1, and CBC to detect any leukemia or aplastic anemia. It is recommended that this exam be repeated on an annual basis and semi-

annual basis for employees 45 yr of age or older or with 10 or more years of exposure to coal tar pitch volatiles. Train workers about the hazards of benzo(a)pyrene and the necessary protective measures to prevent exposure. Periodically inspect lab atmospheres, surfaces such as walls, floors, and benches, and interior of fume hoods and air ducts for contamination. Post appropriate signs and labels on doors leading into areas where benzo(a)pyrene is used.

Respiratory Protection: Seek professional advice prior to respirator selection and use. Follow OSHA respirator regulations (29 CFR 1910.134) and, if necessary, wear a MSHA/NIOSH-approved respirator. The following respirator recommendations are for coal tar pitch volatiles. For any unknown concentration, wear any SCBA with a full facepiece and operated in a pressure-demand or other positive pressure mode, or any supplied-air respirator with a full facepiece and operated in a pressure-demand or other positive pressure mode in combination with an auxiliary SCBA operated in pressure-demand or other positive pressure mode. For escape, wear any air-purifying full facepiece respirator (gas mask) with a chin-style or front- or back-mounted organic vapor canister having a high-efficiency particulate filter, or any appropriate escape-type SCBA. Select respirator based on its suitability to provide adequate worker protection for given working conditions, level of airborne contamination, and presence of sufficient oxygen. For emergency or nonroutine operations (cleaning spills, reactor vessels, or storage tanks), wear an SCBA. *Warning! Air-purifying respirators do not protect workers in oxygen-deficient atmospheres.* If respirators are used, OSHA requires a written respiratory protection program that includes at least: medical certification, training, fit-testing, periodic environmental monitoring, maintenance, inspection, cleaning, and convenient, sanitary storage areas.

Protective Clothing/Equipment: Wear chemically protective gloves, boots, aprons, and gauntlets to prevent prolonged or repeated skin contact. In animal laboratories, wear protective suits (disposable, one-piece and close-fitting at ankles and wrists), gloves, hair covering, and overshoes. In chemical laboratories, wear gloves and gowns. Wear protective eyeglasses or chemical safety, gas-proof goggles, per OSHA eye- and face-protection regulations (29 CFR 1910.133). Because contact lens use in industry is controversial, establish your own policy.

Safety Stations: Make available in the work area emergency eyewash stations, safety/quick-drench showers, and washing facilities.

Contaminated Equipment: Shower and change clothes after exposure or at the end of the workshift. Separate contaminated work clothes from street clothes. Launder before reuse. Remove benzo(a)pyrene from your shoes and clean personal protective equipment. Use procedures to ensure laundry personnel are not exposed.

Comments: Never eat, drink, or smoke in work areas. Practice good personal hygiene after using this material, especially before eating, drinking, smoking, using the toilet, or applying cosmetics.

Section 9 - Physical and Chemical Properties

Physical State: Solid

Appearance and Odor: Pale yellow monoclinic needles with a faint, aromatic odor.

Vapor Pressure: >1 mm Hg at 68 °F (20 °C)

Formula Weight: 252.30

Specific Gravity (H_2O=1, at 4 °C): 1.351

Water Solubility: Insoluble; 0.0038 mg (+/- 0.00031 mg) in 1 L at 77 °F (25 °C)

Other Solubilities: Ether, benzene, toluene, xylene, concentrated hydrosulfuric acid; sparingly soluble in alcohol, methanol.

Boiling Point: >680 °F (>360 °C); 540 °F (310 °C) at 10 mm Hg

Melting Point: 354 °F (179 °C)

Octanol/Water Partition Coefficient: log Kow= 6.04

Section 10 - Stability and Reactivity

Stability: Benzo(a)pyrene is stable at room temperature in closed containers under normal storage and handling conditions. It undergoes photo-oxidation when exposed to sunlight or light in organic solvents and is also oxidized by chromic acid and ozone.

Polymerization: Hazardous polymerization cannot occur.

Chemical Incompatibilities: Strong oxidizers (chlorine, bromine, fluorine) and oxidizing chemicals (chlorates, perchlorates, permanganates, and nitrates).

Conditions to Avoid: Avoid heat and ignition sources and incompatibles.

Hazardous Decomposition Products: Thermal oxidative decomposition of benzo(a)pyrene can produce carbon monoxide and carbon dioxide.

Section 11- Toxicological Information

Toxicity Data:*

Tumorigenic Effects:

Rat, oral: 15 mg/kg produced gastrointestinal and musculoskeletal tumors.

Mouse, inhalation: 200 ng/m^3/6 hr administered intermittently over 13 weeks produced tumors of the lungs.

Rabbit, skin: 17 mg/kg administered intermittently over 57 weeks produced tumors of the skin and appendages.

Teratogenicity:

Rat, oral: 2 g/kg administered 28 days prior to mating and 1-22 days of pregnancy produced a stillbirth.

Rat, oral: 40 mg/kg on the 14th day of pregnancy caused changes in the extra embryonic structures.

Mouse, oral: 75 mg/kg administered to the female during the 12-14 day of pregnancy produced biochemical and metabolic effects on the newborn.

Skin Effects:
Mouse: 14 µg caused mild irritation.

Mutagenicity:
Human, liver cell: 100 nmol/L caused DNA damage.
Human, lung cell: 1 µmol/L caused DNA damage.
Human, HeLa cell: 1500 nmol/L caused DNA inhibition.

* See NIOSH, *RTECS* (DJ3675000), for additional toxicity data.

Section 12 - Ecological Information

Ecotoxicity: Oysters, BCF (bioconcentration factor): 3000; rainbow trout, BCF: 920; *Daphnia pulex*, BCF: 13,000.
Environmental Transport: Some marine organisms such as phytoplankton, certain zooplankton, scallops (*Placopecten sp*), snails (*Litternia littorea*), and mussels (*Mytilus edulis*) lack a metabolic detoxification enzyme system to metabolize benzo(a)pyrene and therefore, tend to accumulate benzo(a)pyrene. Humic acid in solution may decrease bioconcentration.
Environmental Degradation: If released to water, benzo(a)pyrene adsorbs very strongly to particulate matter and sediments, bioconcentrates in aquatic organisms which cannot metabolize it, but does not hydrolyze. Direct photolysis at the water surface, evaporation, or biodegradation may be important, but adsorption may significantly retard these processes. Adsorption to particulates may also retard direct photolysis when benzo(a)pyrene is released to air. Benzo(a)pyrene may be removed from air by reaction with nitrogen dioxide (half-life, 7 days) or ozone (half-life, 37 min), or photochemically produced hydroxyl radicals (estimated half-life, 21.49 hr).
Soil Absorption/Mobility: It will adsorb very strongly to the soil. Although it is not expected to appreciably leach to the groundwater, groundwater samples indicate that it can be transported there. It is not expected to significantly evaporate or hydrolyze from soils and surfaces. However, it may be subject to appreciable biodegradation in soils.

Section 13 - Disposal Considerations

Disposal: Small quantities: 10 mL of a solution containing 0.3 mol/L of potassium permanganate and 3 mol/L of sulfuric acid will degrade 5 mg of benzo(a)pyrene. Also, can treat with sodium dichromate in strong sulfuric acid (1-2 days). Benzo(a)pyrene is also a good candidate for fluidized bed incineration at a temperature range of 842 to 1796 °F (450 to 980 °C) or rotary kiln incineration at 820 to 1600°C. Contact your supplier or a licensed contractor for detailed recommendations. Follow applicable Federal, state, and local regulations.

Section 14 - Transport Information

DOT Transportation Data (49 CFR 172.101):

Shipping Name: Environmentally hazardous substances, solid, n.o.s.*
Shipping Symbols: —
Hazard Class: 9
ID No.: UN3077
Packing Group: III
Label: Class 9
Special Provisions (172.102): 8, B54

Packaging Authorizations
a) Exceptions: 173.155
b) Non-bulk Packaging: 173.213
c) Bulk Packaging: 173.240

Quantity Limitations
a) Passenger, Aircraft, or Railcar: None
b) Cargo Aircraft Only: None

Vessel Stowage Requirements
a) Vessel Stowage: A
b) Other: —

* If it is in a quantity, in one package, which equals or exceeds the reportable quantity (RQ) of 1 lb (0.454 kg)

Section 15 - Regulatory Information

EPA Regulations:
Listed as a RCRA Hazardous Waste (40 CFR 261.33)
RCRA Hazardous Waste Number: U022
Listed as a CERCLA Hazardous Substance (40 CFR 302.4) per RCRA and CWA, Sec. 307(a)
CERCLA Reportable Quantity (RQ), 1 lb (0.454 kg)
SARA 311/312 Codes: 1,2
SARA Toxic Chemical (40 CFR 372.65): Not listed
SARA EHS (Extremely Hazardous Substance) (40 CFR 355): Not listed
OSHA Regulations:
Listed as an Air Contaminant (29 CFR 1910.1000, Table Z-1)
Listed as an OSHA Specifically Regulated Substance, Coal Tar Pitch Volatiles, (29CFR 1910.1002)

Section 16 - Other Information

References: 73, 103, 124, 127, 132, 133, 136, 139, 148, 164, 169, 174, 175, 184, 187, 189, 190
Prepared By .. MJ Wurth, BS **Industrial Hygiene Review** .... PA Roy, MPH **Medical Review** .... T Thoburn MD, MPH
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Material Safety Data Sheet Collection

Benzo[*b*]fluoranthene MSDS No. 1091

Date of Preparation: 3/98

Section 1 - Chemical Product and Company Identification 51

Product/Chemical Name: Benzo[*b*]fluoranthene
Chemical Formula: $C_{20}H_{12}$
CAS Number: 205-99-2
Synonyms: B[*b*]B; B[*b*]F; BBF; BEF; B[*e*]F; 3,4-benz[*e*]acephenanthrylene; benz[*e*]acephenanthrylene; 2,3-benzfluoranthene; 3,4-benzfluoranthene; 3,4-benzofluoranthene; benzo[*e*]fluoranthene; 2,3-benzofluoranthrene
Derivation: No manufacturing information available; found in coal tar, coke oven emissions, cigarette smoke and automobile exhaust.
General Use: Used as a research chemical.
Vendors: There is no commercial production of this compound in the U.S.

Section 2 - Composition / Information on Ingredients

Benzo[*b*]fluoranthene, ca 100% wt (Note that, except when in the form of a laboratory research chemical, benzo[*b*]fluoranthene is typically found in mixtures with other PAHs (polycyclic aromatic hydrocarbons), such as coal tar pitch).

OSHA PEL	ACGIH TLV	NIOSH REL
As oil mist, mineral	As oil mist, mineral*	As oil mist, mineral
8-hr TWA: 5 mg/m^3	TWA: 5 mg/m^3	10-hr TWA: 5 mg/m^3
	STEL†: 10 mg/m^3	STEL: 10 mg/m^3

*Sampled by method that does not collect vapor.
†Notice of Impending Change: delete STEL

DFG (Germany) MAK
None established

Section 3 - Hazards Identification

ANSI Signal Word: Caution

☆☆☆☆☆ Emergency Overview ☆☆☆☆☆

Benzo[*b*]fluoranthene is a solid in the form of colorless needles. It can be irritating to the respiratory tract, skin and eyes. Like some other PAHs (polycyclic aromatic hydrocarbons), benzo[b]fluoranthene is a possible human carcinogen and mutagen. Handle with care! When heated to decomposition, benzo[*b*]fluoranthene will emit carbon monoxide (CO) and carbon dioxide (CO_2).

Wilson Risk Scale	
R	1
I	2
S	1*
K	1

*Skin absorption

HMIS	
H	2*
F	1
R	0
PPE†	

*Chronic effects
†Sec. 8

Potential Health Effects

Primary Entry Routes: Inhalation, ingestion, skin and/or eye contact/absorption
Target Organs: Eyes, skin, respiratory system, gastrointestinal (GI) system, blood, liver, kidneys
Acute Effects
Inhalation: Irritation may result from inhalation of benzo[*b*]fluoranthene dust or fumes.
Eye: Contact may result in irritation.
Skin: Contact may cause irritation.
Ingestion: None reported.
Carcinogenicity: IARC lists benzo[*b*]fluoranthene as Group 2B (Possibly Carcinogenic to Humans); EPA, B2 (Probable Human Carcinogen, with sufficient evidence from animal studies); MAK, A2 (Unmistakably carcinogenic in animal experimentation only); NTP, 2B (Reasonably anticipated to be a carcinogen, with sufficient evidence of carcinogenicity from studies in experimental animals); and ACGIH, TLV A2 (Suspected human carcinogen). OSHA does not list benzo[*b*]fluoranthene as a carcinogen.
Medical Conditions Aggravated by Long-Term Exposure: None reported.
Chronic Effects: Although there is no direct epidemiological evidence linking benzo[*b*]fluoranthene with cancer, it is frequently a component of mixtures associated with human cancer. Epidemiological studies demonstrate increased incidence of cancer (skin, lung, urinary tract, GI system) with exposure to mixed PAHs and substances that contain them. Coal tar pitch volatiles are reported to cause an excess of bronchitis. In animal studies, benzo[*b*]fluoranthene has been found to be tumorigenic and mutagenic.
Other: Animal testing suggests a synergism (combined effect greater than sum of parts) of mutagenicity between benzo[*b*]fluoranthene and other PAHs.

Section 4 - First Aid Measures

Inhalation: Remove exposed person to fresh air and support breathing as needed.

Eye Contact: *Do not* allow victim to rub or keep eyes tightly shut. Gently lift eyelids and flush immediately and continuously with flooding amounts of water for at least 15 minutes. Consult a physician or ophthalmologist if pain and/or irritation develop.

Skin Contact: *Quickly* remove contaminated clothing. Rinse with flooding amounts of water for at least 15 min. Wash exposed area with soap and water. For reddened or blistered skin, consult a physician.

Ingestion: Never give anything by mouth to an unconscious or convulsing person. Contact a poison control center. Unless the poison control center advises otherwise, have the *conscious and alert* person drink 1 to 2 glasses of water, then induce vomiting.

After first aid, get appropriate in-plant, paramedic, or community medical support.

Note to Physicians: Treat overexposure symptomatically and supportively. Medical surveillance may be necessary for high exposures (skin, mouth, GI, respiratory system).

Section 5 - Fire-Fighting Measures

Flash Point: Not applicable; probable combustible solid **Autoignition Temperature:** None reported.

LEL: None reported. **UEL:** None reported.

Genium

Flammability Classification: Probable combustible solid

Extinguishing Media: Use water spray; carbon dioxide, dry chemical powder or appropriate foam.

Unusual Fire or Explosion Hazards: None reported.

Hazardous Combustion Products: Heating benzo[*b*]fluoranthene to decomposition can produce carbon monoxide (CO) and carbon dioxide (CO_2).

Fire-Fighting Instructions: *Do not* release runoff from fire control methods to sewers or waterways.

Fire-Fighting Equipment: Because fire may produce toxic thermal decomposition products, wear a self-contained breathing apparatus (SCBA) with a full facepiece operated in pressure-demand or positive-pressure mode.

Section 6 - Accidental Release Measures

Spill /Leak Procedures: Notify safety personnel, isolate area and deny entry. Remove sources of ignition, and provide maximum ventilation.

Small Spills: Vacuum or carefully scoop up material and deposit in sealed containers. Absorb liquid containing benzo[*b*]fluoranthene with vermiculite, earth, sand or similar material.

Large Spills

Containment: Dike far ahead of liquid spill for later disposal. *Do not* release into sewers or waterways.

Cleanup: Stay upwind and have cleanup personnel protect against inhalation and contact.

Regulatory Requirements: Follow applicable OSHA regulations (29 CFR 1910.120).

Section 7 - Handling and Storage

Handling Precautions: Avoid dust inhalation, and skin and eye contact. Avoid sunlight exposure of contaminated skin. Use only with ventilation sufficient to reduce airborne concentrations as low as possible. Wear protective gloves, goggles, and clothing (see Sec. 8). Keep away from heat and ignition sources.

Storage Requirements: Store in tightly closed container in cool, well-ventilated area, away from heat, ignition sources and incompatibles (see Sec. 10). Periodically inspect stored materials.

Section 8 - Exposure Controls / Personal Protection

Engineering Controls: Work with benzo[*b*]fluoranthene only under an exhaust hood.

Ventilation: Provide general or local exhaust ventilation systems to maintain airborne concentrations as low as possible. Local exhaust ventilation is preferred because it prevents contaminant dispersion into the work area by controlling it at its source.

Administrative Controls: Have employees with potential for exposure submit to preplacement and periodic medical examinations with emphasis on oral cavity (including sputum cytology), respiratory tract, skin (chronic disorders, lesions), blood (complete count), bladder and kidneys (urinalysis: specific gravity, albumin, glucose, microscopic examination of sediment; urinary cytology). Repeat medical exam on an annual basis, or on a semi-annual basis for employees 45 years or older or with 10 or more years of exposure to pitch volatiles. Periodically inspect lab atmospheres, and surfaces such as walls, floors, and benches and interior of fume hoods and air ducts for contamination. Post appropriate signs and labels on doors leading to areas where benzo[*b*]fluoranthene is used.

Respiratory Protection: Seek professional advice prior to respirator selection and use. Follow OSHA respirator regulations (29 CFR 1910.134) and, if necessary, wear a MSHA/NIOSH-approved respirator. Select respirator based on its suitability to provide adequate worker protection for given working conditions, level of airborne contamination, and presence or absence of adequate oxygen. For any detectable concentration (of coal tar pitch volatiles) use SCBA with full facepiece operated in pressure-demand

or other positive pressure mode, or supplied-air respirator with full facepiece operated in pressure-demand or other positive pressure mode in combination with auxiliary SCBA operated in pressure-demand or other positive pressure mode; escape, air purifying full face respirator (gas mask) with a chin-style or a front- or back-mounted organic vapor canister and with a full facepiece and a fume or high-efficiency filter, or escape-type SCBA. *Warning! Air-purifying respirators do not protect workers in oxygen-deficient atmospheres.* If respirators are used, OSHA requires a written respiratory protection program that includes at least: medical certification, training, fit-testing, periodic environmental monitoring, maintenance, inspection, cleaning, and convenient, sanitary storage areas.

Protective Clothing/Equipment: Wear chemically protective gloves, boots, aprons, and gauntlets to prevent skin contact. Wear splash-proof chemical safety goggles, and face shield (8-inch minimum), per OSHA eye- and face-protection regulations (29 CFR 1910.133). Contact lenses are not eye protective devices. Appropriate eye protection must be worn instead of, or in conjunction with contact lenses.

Safety Stations: Make emergency eyewash stations, safety/quick-drench showers, and washing facilities available in work area.

Contaminated Equipment: Separate contaminated work clothes from street clothes. Launder before reuse. Remove this material from your shoes and clean personal protective equipment.

Comments: Never eat, drink, or smoke in work areas. Practice good personal hygiene after using this material, especially before eating, drinking, smoking, using the toilet, or applying cosmetics.

Section 9 - Physical and Chemical Properties

Physical State: Solid

Appearance and Odor: Colorless needles

Vapor Pressure: 5 x10^{-7} mm Hg at 68 °F (20 °C)

Formula Weight: 252.32

Other Solubilities: 95% ethanol: <1 mg/mL at 66 °F (19 °C); acetone: 10-50 mg/mL at 66 °F (19 °C); benzene: slightly soluble; DMSO: 10-50 mg/mL at 66 °F (19 °C).

Water Solubility: 0.0012 mg/L

Melting Point: 334.4 °F (168 °C)

Henry's Law Constant (H): 1.38 x10^{-4} atm-m^3/mole, estimated

Octanol/Water Partition Coefficient: log K_{ow} = 6.124

Soil Sorption Coefficient (log K_{oc}): 5.88, estimated

Section 10 - Stability and Reactivity

Stability: Benzo[*b*]fluoranthene is stable at room temperature in closed containers under normal storage and handling conditions.

Polymerization: Hazardous polymerization cannot occur.

Chemical Incompatibilities: Include strong oxidizing agents.

Conditions to Avoid: Heat, sunlight.

Hazardous Decomposition Products: Thermal oxidative decomposition of benzo[*b*]fluoranthene will produce carbon monoxide (CO) and carbon dioxide (CO_2).

Section 11- Toxicological Information

Toxicity Data:*

Tumorigenicity:

Rat, implant: 5 mg/kg produced toxic effects: tumorigenic - equivocal tumorigenic agent by RTECS criteria; lungs, thorax, or respiration - tumors; tumorigenic - tumors at site of application.

Mouse, skin: 88 ng/kg/120 weeks intermittently produced toxic effects: tumorigenic - carcinogenic by RTECS criteria; skin and appendages - tumors; tumorigenic - tumors at site of application.

Mouse, skin: 72 mg/kg/60 weeks intermittently produced toxic effects: tumorigenic - equivocal tumorigenic agent by RTECS criteria; skin and appendages - tumors; tumorigenic - tumors at site of application.

Mouse, skin: 4037 µg/kg/20 days intermittently produced toxic effects: tumorigenic - equivocal tumorigenic agent by RTECS criteria; skin and appendages - tumors.

Genetic Effects:

Human, lymphocyte cells: 55 µg/L produced mutation.

Rat, intraperitoneal: 100 mg/kg resulted in DNA adducts.

Rat, intraperitoneal: 100 mg/kg induced sister chromatid exchange.

Hamster, lung cells: 100 µg/L produced morphological transformation.

*See NIOSH, *RTECS* (CU1400000), for additional toxicity data.

Section 12 - Ecological Information

Ecotoxicity: Evidence suggests that PAHs in lake bottom sediments may cause tumors in fish.

Environmental Fate: Benzo[*b*]fluoranthene has a low vapor pressure and Henry's Law Constant, and will not readily evaporate from water or soil. In surface water, it will partition from the water column to suspended sediments. Limited biocon[illegible]ion

in aquatic organisms may occur (polychaete worms, BCF = 9.1); however, fish have an enzyme (microsomal oxidase) capable of rapidly metabolizing PAHs.

Environmental Degradation: Photolysis, photo-oxidation, and volatilization of dissolved benzo[*b*]fluoranthene may occur, but adsorption to suspended sediments is expected to inhibit these processes. Release to the soil may result in some biodegradation. Photolysis is not expected to be significant after release to soil. In the atmosphere it is likely to be adsorbed to particulate matter, and will be subject to wet and dry deposition. In the atmosphere, benzo[*b*]fluoranthene will rapidly degrade by reaction with photochemically produced hydroxyl radicals (half life 1.00 day).

Soil Adsorption/Mobility: A high Koc indicates significant sorption and low mobility in the soil column.

Section 13 - Disposal Considerations

Disposal: Benzo[*b*]fluoranthene is a good candidate for rotary kiln incineration. Contact your supplier or a licensed contractor for detailed recommendations. Follow applicable Federal, state, and local regulations.

Section 14 - Transport Information

DOT Transportation Data (49 CFR 172.101):

Shipping Name: Environmentally hazardous substances, solid, n.o.s.*
Shipping Symbols: –
Hazard Class: 9
ID No.: UN3077
Packing Group: III
Label: Class 9
Special Provisions (172.102): 8, B54

Packaging Authorizations
a) Exceptions: 173.155
b) Non-bulk Packaging: 173.213
c) Bulk Packaging: 173.240

Quantity Limitations
a) Passenger, Aircraft, or Railcar: No limit
b) Cargo Aircraft Only: No limit

Vessel Stowage Requirements
a) Vessel Stowage: A
b) Other: –

*If in a quantity in one package which equals or exceeds the final reportable quantity of 1 lb (0.454 kg).

Section 15 - Regulatory Information

EPA Regulations:
Listed as a RCRA Hazardous Waste (40 CFR 261.33)
RCRA Hazardous Waste Number: F039
Listed as a CERCLA Hazardous Substance (40 CFR 302.4) specific per (2) CWA Section 307(a)
CERCLA Final Reportable Quantity (RQ): 1 lb (0.454 kg)
Listed as a SARA Toxic Chemical (40 CFR 372.65)
SARA EHS (Extremely Hazardous Substance) (40 CFR 355): Not listed

OSHA Regulations:
Listed as an Air Contaminant (29 CFR 1910.1000, Table Z-1 as oil mist, mineral)

Section 16 - Other Information

References: 1, 73, 103, 136, 209, 216, 217, 223, 230, 232

Prepared By..... HM Spliethoff, MS
Industrial Hygiene Review..... S Gilson, CIH
Medical Review..... G Kelafant, MD

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Material Safety Data Sheet Collection
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Amsterdam, NY 12010
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Issue Date: 2001-06

Section 1 - Chemical Product and Company Identification 55

Material Name: Dibenz[a,h]anthracene **CAS Number:** 53-70-3
Chemical Formula: $C_{22}H_{14}$
Synonyms: 1,2:5,6-BENZANTHRACENE; DB(A,H)A; 1,2,5,6-DBA; DBA; 1,2,5,6-DIBENZANTHRACEEN; 1,2,5,6-DIBENZANTHRACENE; 1,2:5,6-DIBENZ(A)ANTHRACENE; 1,2:5,6-DIBENZANTHRACENE; DIBENZ[A,H]ANTHRACENE; 1,2:5,6-DIBENZOANTHRACENE; DIBENZO(A,H)ANTHRACENE
General Use: research chemical

Section 2 - Composition / Information on Ingredients

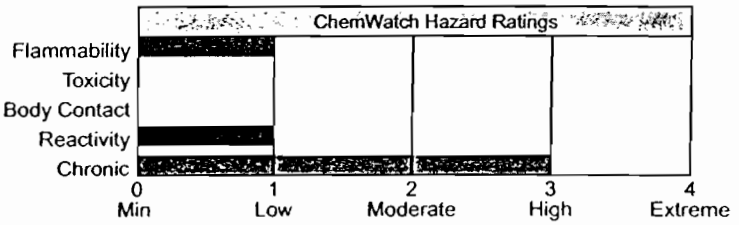
Name	CAS	%
dibenz[a,h]anthracene	53-70-3	>98

OSHA PEL
No data found.

NIOSH REL
No data found.

ACGIH TLV
No data found.

Section 3 - Hazards Identification



ANSI Signal Word

Warning!

☆☆☆☆☆ **Emergency Overview** ☆☆☆☆☆

Colorless crystals, plates or leaflets. May cause irritation. Toxic. Chronic Effects: may cause heritable genetic damage; mutagen. Carcinogen. Will burn.

Potential Health Effects

Target Organs: respiratory system, liver
Primary Entry Routes: accidental skin and eye contact, inhalation of generated dusts
Acute Effects

Inhalation: The dust is harmful and discomforting to the upper respiratory tract. Persons with impaired respiratory function, airway diseases, or conditions such as emphysema or chronic bronchitis may incur further disability if excessive concentrations of particulate are inhaled.

Eye: The dust may be discomforting to the eyes and is capable of causing a mild, temporary redness of the conjunctiva (similar to wind-burn), temporary impairment of vision and/ or other transient eye damage/ ulceration.

Skin: The material may be mildly discomforting to the skin. Open cuts and abraded or irritated skin should not be exposed to this material. Toxic effects may result from skin absorption.

Ingestion: The solid/dust is discomforting to the gastrointestinal tract and harmful if swallowed. Considered an unlikely route of entry in commercial/industrial environments.

Carcinogenicity: NTP - Listed; IARC - Group 2A, Probably carcinogenic to humans; OSHA - Not listed; NIOSH - Not listed; ACGIH - Not listed; EPA - Class B2, Probable human carcinogen based on animal studies; MAK - Not listed.

Chronic Effects: The so-called polycyclic aromatic hydrocarbons (PAHs) comprise a large family; some members occur in coal tar, tobacco smoke, petroleum and air pollution. Some substituted derivative[illegible] animal studies, as amongst the most highly active carcinogens. Rodent species are sensiti[illegible] application producing cancerous growths. Injection produces soft tissue tumors (sarcom[illegible] Administration of PAHs to Rhesus monkey on the other hand has not yet proved success[illegible] there is inadequate date to support the proposition that individual PAHs produce cancer in h[illegible]ons. There is however

a number of epidemiology and mortality studies that show increased incidence of cancer in humans exposed to mixtures of PAHs. Evidence exists of lung and genito-urinary cancer mortality amongst coke-oven workers and skin tumors in workers exposed to creosote. Exposures to other chemical mixtures containing PAHs such as cigarette smoke, coal tar, coal tar pitch and bitumens, have been associated with increased incidences of lung cancer in humans.

Section 4 - First Aid Measures

Inhalation: • If dust is inhaled, remove to fresh air.
• Encourage patient to blow nose to ensure clear breathing passages.
• Rinse mouth with water. Consider drinking water to remove dust from throat.
• Seek medical attention if irritation or discomfort persist.
• If fumes or combustion products are inhaled, remove to fresh air.
• Lay patient down. Keep warm and rested.
• Other measures are usually unnecessary.
Eye Contact: • Immediately hold the eyes open and flush with fresh running water.
• Ensure complete irrigation of the eye by keeping eyelids apart and away from eye and moving the eyelids by occasionally lifting the upper and lower lids.
• Seek medical attention if pain persists or recurs.
• Removal of contact lenses after an eye injury should only be undertaken by skilled personnel.
Skin Contact: • Immediately remove all contaminated clothing, including footwear (after rinsing with water).
• Wash affected areas thoroughly with water (and soap if available).
• Seek medical attention in event of irritation.
Ingestion: Contact a Poison Control Center. If more than 15 minutes from a hospital:
• INDUCE vomiting with IPECAC SYRUP, or fingers down the back of the throat, ONLY IF CONSCIOUS. Lean patient forward or place on left side (head-down position, if possible) to maintain open airway and prevent aspiration. NOTE: Wear a protective glove when inducing vomiting by mechanical means.
• SEEK MEDICAL ATTENTION WITHOUT DELAY.
• In the meantime, qualified first-aid personnel should treat the patient following observation and employing supportive measures as indicated by the patient's condition.
• If the services of a medical officer or medical doctor are readily available, the patient should be placed in his/her care and a copy of the MSDS should be provided.
• If medical attention is not available on the worksite or surroundings send the patient to a hospital together with a copy of the MSDS.
After first aid, get appropriate in-plant, paramedic, or community medical support.
Note to Physicians: Treat symptomatically.

Section 5 - Fire-Fighting Measures

Flash Point: Not available; probably combustible
Extinguishing Media: Foam. Dry chemical powder. BCF (where regulations permit). Carbon dioxide. Water spray or fog - Large fires only.
General Fire Hazards/Hazardous Combustion Products: • Solid which exhibits difficult combustion or is difficult to ignite.
• Avoid generating dust, particularly clouds of dust in a confined or unventilated space, as dust may form an explosive mixture with air and any source of ignition, e.g., flame or spark, will cause fire or explosion.
• Dry dust can also be charged electrostatically by turbulence, pneumatic transport, pouring, in exhaust ducts and during transport.
• Build-up of electrostatic charge may be prevented by bonding and grounding.
• Powder handling equipment such as dust collectors, dryers and mills may require additional protection measures such as explosion venting.
Fire Incompatibility: Avoid contamination with oxidizing agents i.e., nitrates, oxidizing acids, chlorine bleaches, pool chlorine etc. as ignition may result.
Fire-Fighting Instructions: • Contact fire department and tell them location and nature of hazard.
• Wear breathing apparatus plus protective gloves for fire only.
• Prevent, by any means available, spillage from entering drains or waterways.
• Use fire fighting procedures suitable for surrounding fire.
• Do not approach containers suspected to be hot.
• Cool fire-exposed containers with water spray from a protected location.
• If safe to do so, remove containers from path of fire.
• Equipment should be thoroughly decontaminated after use.

Section 6 - Accidental Release Measures

Small Spills: • Clean up all spills immediately.
• Avoid contact with skin and eyes.

- Wear protective clothing, gloves, safety glasses and dust respirator.
- Use dry clean up procedures and avoid generating dust.
- Vacuum up or sweep up.
- Place in clean drum then flush area with water.

Large Spills:
- Clear area of personnel and move upwind.
- Contact fire department and tell them location and nature of hazard.
- Wear breathing apparatus plus protective gloves.
- Prevent, by any means available, spillage from entering drains or waterways.
- No smoking, bare lights or ignition sources.
- Increase ventilation.
- Stop leak if safe to do so.
- Water spray or fog may be used to disperse/absorb vapor.
- Contain or absorb spill with sand, earth or vermiculite.
- Collect recoverable product into labeled containers for recycling.
- Collect solid residues and seal in labeled drums for disposal.
- Wash area and prevent runoff into drains.
- After clean up operations, decontaminate and launder all protective clothing and equipment before storing and reusing.
- If contamination of drains or waterways occurs, advise emergency services.

Regulatory Requirements: Follow applicable OSHA regulations (29 CFR 1910.120).

Section 7 - Handling and Storage

Handling Precautions:
- Avoid all personal contact, including inhalation.
- Wear protective clothing when risk of overexposure occurs.
- Use in a well-ventilated area.
- Prevent concentration in hollows and sumps.
- DO NOT enter confined spaces until atmosphere has been checked.
- Do not allow material to contact humans, exposed food or food utensils.
- Avoid smoking, bare lights or ignition sources.
- When handling, DO NOT eat, drink or smoke.
- Avoid contact with incompatible materials.
- Keep containers securely sealed when not in used.
- Avoid physical damage to containers.
- Always wash hands with soap and water after handling.
- Working clothes should be laundered separately. Launder contaminated clothing before reuse.
- Follow good occupational work practices.
- Observe manufacturer's storage/handling recommendations.
- Atmosphere should be regularly checked against established exposure standards to ensure safe working conditions are maintained.

Recommended Storage Methods: Glass container. Plastic container. Metal can. Metal drum. Check that all containers are clearly labeled and free from leaks.

Regulatory Requirements: Follow applicable OSHA regulations.

Section 8 - Exposure Controls / Personal Protection

Engineering Controls: Local exhaust ventilation usually required. If risk of overexposure exists, wear NIOSH-approved respirator. Provide adequate ventilation in warehouse or closed storage area.

Personal Protective Clothing/Equipment

Eyes: Safety glasses with side shields or chemical goggles. Contact lenses pose a special hazard; soft lenses may absorb irritants and all lenses concentrate them.

Hands/Feet: Wear chemical protective gloves, e.g. PVC. Wear safety footwear.

Other:
- Overalls.
- PVC Apron.
- PVC protective suit may be required if exposure severe.
- Eyewash unit.
- Ensure there is ready access to a safety shower.

Section 9 - Physical and Chemical Properties

Appearance/General Info: Light-yellow crystalline powder. Soluble in petroleum ether, benzene, toluene, xylene, oils and cyclohexanane.

Physical State: colorless crystals, plates or leaflets

Vapor Pressure (kPa): 1 x10^{-10} mm Hg

Formula Weight: 278.33

Specific Gravity (H_2O=1, at 4 °C): 1.282

Water Sol:

Boiling Point:

Freezing/Melting:

Volatile Component (% Vol): Negligible

Section 10 - Stability and Reactivity

Stability/Polymerization/Conditions to Avoid: Product is considered stable. Hazardous polymerization will not occur.
Storage Incompatibilities: Avoid reaction with oxidizing agents.

Section 11 - Toxicological Information

No significant acute toxicological data identified in literature search.
NOTE: Substance has been shown to be mutagenic in various assays, or belongs to a family of chemicals producing damage or change to cellular DNA.

See NIOSH, *RTECS* HN2625000, for additional data.

Section 12 - Ecological Information

Environmental Fate: Release to the environment is quite general since it is a ubiquitous product of incomplete combustion. It is largely associated with particulate matter, soils, and sediments. Its presence in places distant from primary sources indicates that it is reasonably stable in the atmosphere and capable of long distance transport. If it is released to soils it will be expected to adsorb very strongly to the soils and will not be expected to leach to the groundwater, hydrolyze or evaporate from soils or surfaces. It will be subject to biodegradation in soils with reported half-lives of 18 and 21 days. If it is released to water it will be expected to adsorb very strongly to sediments and particulate matter and to bioconcentrate in aquatic organisms which lack microsomal oxidase (this enzyme enables the rapid metabolism of certain polycyclic aromatic hydrocarbons). Based on limited data from laboratory screening tests using settled domestic wastewater and activated sludge, it may be subject to biodegradation in natural waters. Since it absorbs solar radiation strongly, it may be subject to direct photolysis in natural waters. However, adsorption may significantly retard photolysis as the photosensitivity of polyaromatic hydrocarbons is strongly dependent upon the nature of the surface upon which the compound is adsorbed. It will not hydrolyze and should not evaporate from water. If released to the atmosphere it will likely be associated with particulate matter and may be subject to moderately long range transport, depending mainly on the particle size distribution and climatic conditions which will determine the rates of wet and dry deposition. Its presence in areas remote from primary sources demonstrates the potential for this long range transport as well as it's considerable stability in the air. It may be subject to direct photolysis in the atmosphere; however, adsorption may significantly retard photolysis as the photosensitivity of polyaromatic hydrocarbons is strongly dependent upon the nature of the surface upon which the compound is adsorbed. The estimated vapor phase half-life in the atmosphere is 1.00 day as a result of reaction with photochemically produced hydroxyl radicals.
Ecotoxicity: TLm Neanthes arenaceodentata > 1 ppm/96 hr at 22 °C in a static bioassay
Henry's Law Constant: calculated at 7×10^{-8}
BCF: daphnia manga 652
Octanol/Water Partition Coefficient: log $K_{ow} = 6.50$
Soil Sorption Partition Coefficient: K_{oc} = sediments 8.05392×10^{5} to 3.059425×10^{6}

Section 13 - Disposal Considerations

Disposal: • Recycle wherever possible or consult manufacturer for recycling options.
• Follow applicable local, state, and federal regulations.
• Bury residue in an authorized landfill.
• Recycle containers if possible, or dispose of in an authorized landfill.

Section 14 - Transport Information

DOT Transportation Data (49 CFR 172.101):

Shipping Name: TOXIC SOLID, ORGANIC, N.O.S.
Additional Shipping Information:
Hazard Class: 6.1
ID No.: 2811
Packing Group: III
Label: Harmful[6]

Section 15 - Regulatory Information

EPA Regulations:
RCRA 40 CFR: Listed U063 Toxic Waste
CERCLA 40 CFR 302.4: Listed per RCRA Section 3001, and per CWA Section 307(a) 1 lb (0.454 kg)
SARA 40 CFR 372.65: Listed

SARA EHS 40 CFR 355: Not listed
TSCA: Listed

Section 16 - Other Information

Research Date:.....2000-11 **Review Date:** 2001-05

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INDENO(1,2,3-CD)PYRENE

RTECS: NK9300000
EINECS Number: 205-893-2
Molecular Formula: $C_{22}H_{12}$
Formula Weight: 276.34
Synonyms: IDENO(1,2,3-CD)PYRENE; INDENO(1,2,3-C,D) PYRENE; INDENO(1,2,3-C,D)PYRENE; INDENOPYRENE; IP; 1,10-(1,2-PHENYLENE)PYRENE; 1,10-(O-PHENYLENE)PYRENE; 1,10-(ORTHO-PHENYLENE)PYRENE; 2,3-O-PHENYLENEPYRENE; 2,3-ORTHO-PHENYLENEPYRENE; 2,3-PHENYLENEPYRENE; O-PHENYLENEPYRENE; ORTHO-PHENYLENEPYRENE
Description: yellow plates or needles
Use: research chemical

Physical Properties

Boiling Point: 530 °C (986 °F)
Freezing Point: 162.5 °C (324.5 °F) to 164 °C (327.2 °F)
Vapor Pressure: 1.0×10^{-1} mm Hg
Water Solubility: 0.062 mg/L Water

RTECS Toxicity Data

Mutagenic: Hamster Morphological Transformation; Cell Type: lung; Dose: 100 ug/L. Bacteria - S Typhimurium Mutations in Microorganisms; Dose: 3 ug/plate/48H (-S9).
Tumorigenic: Rat Route: Implant; Dose: 4150 ug/kg; Toxic Effects: Tumorigenic - Carcinogenic by RTECS criteria; Lungs, Thorax, or Respiration - Tumors; Tumorigenic - Tumors at site of application. Rat Route: Implant; Dose: 20750 ug/kg; Toxic Effects: Tumorigenic - Carcinogenic by RTECS criteria; Lungs, Thorax, or Respiration - Tumors; Tumorigenic - Tumors at site of application. Rat Route: Implant; Dose: 5 mg/kg; Toxic Effects: Tumorigenic - Equivocal tumorigenic agent by RTECS criteria; Lungs, Thorax, or Respiration - Tumors; Tumorigenic - Tumors at site of application.

Hazard Overviews

Carcinogenicity: IARC - Group 2B, Possibly carcinogenic to humans; NIOSH - Not listed; NTP - Listed; ACGIH - Not listed; OSHA - Not listed; EPA - Class B2, Probable human carcinogen based on animal studies; MAK - Not listed

Environmental

Environmental Fate: If released to soil it will sorb strongly (estimated $K_{oc} = 20,146$) and hence is not expected to leach. No information was found about volatilization from, hydrolysis in, or biodegradation in soil. Released to water it will sorb strongly to suspended particulate matter, biota and sediments. Although there is a high potential to bioconcentrate in most aquatic organisms, it may not in fish since fish contain microsomal oxidase, which allows polyaromatic hydrocarbons to be metabolized. No information was found about volatilization, photolysis, hydrolysis, or biodegradation in water. It will probably be persistent in the aquatic environment and concentrate in sediments. Almost all released to the atmosphere will be sorbed to particulate matter; thus its atmospheric fate will primarily depend on physical processes such as dry and wet deposition. However, a computer-estimated half-life in the vapor phase is about 20 hours due to reaction with photochemically produced hydroxyl radicals.

Environmental Physical Data

Henry's Law Constant: 5.89×10^{-10}
Octanol/Water Partition Coefficient: log $K_{ow} = 6.584$
Sorption Partition Coefficient: 2.0146×10^{4}
BCF: estimated at 5.9407×10^{4}

Regulations

RCRA 40CFR: Listed Hazardous Waste No. U137 Toxic Waste

CERCLA: 40CFR 302.4: Listed per RCRA Section 3001 per CWA Section 307(a) RQ: 100 lb (45.35 kg)
SARA 40CFR 372.65: Listed
SARA EHS 40CFR 355: Not listed
TSCA: Listed

Analytical Methods

Air: EPA TO-13; California 429
Soil: CLP LC_SV, MC_SVOA, OHC; EPA 16, 1625, PAH-005, PAH-007, PAH-011, PAH-012; SW846 3630B, 3640A, 8100, 8250A, 8270B, 8270C, 8275A, 8310; DOE OS050
Water / Groundwater: EPA PAH-002, PAH-006, 1625, 610, 625, 625-S, 6; APHA 6410-B, 6440-B, 6440-C; ASTM D4657; USGS O3118
Drinking Water: EPA 525.1, 525.2, 550, 550.1
Indoor / Expired Air: NIOSH 5506, 5515; EPA IP-7-A, IP-7-B
Plasma: EPA 29
Other: EPA PAH-009

Material Safety Data Sheet Collection
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Aroclor 1254
MSDS 1184
ARO7650

Section 1 - Chemical Product and Company Identification 54.1

Material Name: Aroclor 1254 **CAS Number:** 11097-69-1
Chemical Formula: $C_{12}H_5Cl_5$ (approx)
Structural Chemical Formula: $C_6H_2Cl_3C_6H_3Cl_2$ (approx)
Synonyms: AROCHLOR 1254; AROCLOR 1254; CHLORIERTE BIPHENYLE,CHLORGEHALT 54%; CHLORODIPHENYL (54% CHLORINE); CHLORODIPHENYL (54% CL); CHLORODIPHENYL,54 PERCENT CHLORINE; CLORODIFENILI,CLORO 54%; DIPHENYLE CHLORE,54% DE CHLORE; PCB; PCB-1254; PCB 1254; POLYCHLORINATED BIPHENYL; POLYCHLORINATED BIPHENYL 1254; POLYCHLORINATED BIPHENYL (AROCLOR 1254)
General Use: Used as dielectric fluids in transformers and capacitors. Prior to 1972, were used as hydraulic and other industrial fluids (e.g., in vacuum pumps, as lubricants and cutting oils), in paints, inks and fire retardants.
Also used in heat transfer systems; gas-transmission turbines; carbonless reproducing paper; adhesives; as plasticizer in epoxy paints; fluorescent light ballasts; wax extenders; coolants; de-dusting agents; pesticide extenders; surface treatment and coatings; sealants; caulking material.
This is one of a group of once widely used industrial chemicals whose high stability contributed both to their commercial usefulness and long term deleterious environmental health effects. Consequently their use has been phased out. Manufacture in the U.S.A. was discontinued in 1977 and they were banned as imports in 1979.

Section 2 - Composition / Information on Ingredients

Name	CAS	%
Aroclor 1254	11097-69-1	>100

OSHA PEL
TWA: 0.5 mg/m^3; skin.

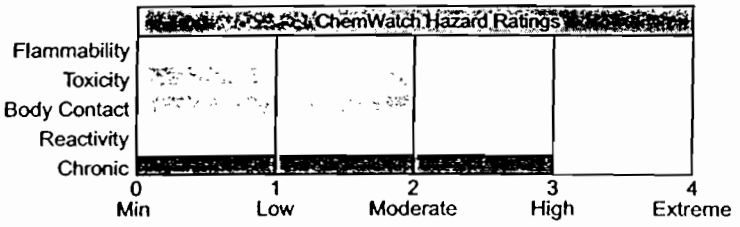
NIOSH REL
No data found.

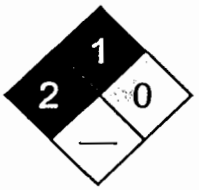
DFG (Germany) MAK
TWA: 0.05 ppm; 0.5 mg/m^3.

ACGIH TLV
TWA: 0.5 mg/m^3.

IDLH Level
5 mg/m^3.

Section 3 - Hazards Identification





Fire Diamond

ANSI Signal Word
Warning!

☆☆☆☆☆ Emergency Overview ☆☆☆☆☆

Oily liquid, white crystalline solid, or hard resin. Severely irritating. Suspect cancer hazard. Chronic: chloracne, GI disturbances, neurological symptoms, liver enlargement, menstrual changes, bronchitis. Possible reproductive and teratogenic effects.

Potential Health Effects

Primary Entry Routes: inhalation, skin contact, ingestion
Target Organs: skin, liver, eyes, mucous membranes, respiratory system
Acute Effects
Inhalation: Not normally a hazard due to nonvolatile nature of product. Inhalation of vapor is more significant at higher than normal temperatures.

The vapor/mist is discomforting and may be extremely toxic if inhaled.

Eye: The vapor/liquid is moderately discomforting and may be harmful to the eyes.

Skin: The liquid is harmful to the skin, it is rapidly absorbed, and is capable of causing skin reactions.

Exposure to material may result in a dermatitis, described as chloracne, a persistent acneiform characterized by comedones (white-, and black- heads), keratin cysts, and inflammed papules with hyperpigmentation and an anatomical distribution frequently involving the skin under the eyes and behind the ears. It occurs after acute or chronic exposure to a variety of chlorinated aromatic compounds by skin contact, ingestion or inhalation and may appear within days or months following the first exposure. Other dermatological alterations including hypertrichosis (the growth of excess hair), an increased incidence of actinic or solar elastosis (the degeneration of elastic tissue within muscles or loss of dermal elasticity produced by the effects of sunlight), and Peyrone's disease (a rare progressive scarring of the penile membrane).

Ingestion: Considered an unlikely route of entry in commercial/industrial environments.

The material is moderately discomforting to the gastrointestinal tract and may be harmful if swallowed in large quantity.

Ingestion may result in nausea, pain, vomiting. Vomit entering the lungs by aspiration may cause potentially lethal chemical pneumonitis.

Digestion may lead to nausea, vomiting, abdominal pain, anorexia, jaundice and liver damage, coma and death.

Headache, dizziness, lethargy, depression, nervousness, loss of libido, muscle, joint pains may be found.

Symptoms appear after a latent period of 5 to 6 months.

PCB's may appear in the breast milk of exposed mothers and in newborn infants.

Carcinogenicity: NTP - Class 2B, Reasonably anticipated to be a carcinogen, sufficient evidence of carcinogenicity from studies in experimental animals; IARC - Group 2A, Probably carcinogenic to humans; OSHA - Not listed; NIOSH - Listed as carcinogen; ACGIH - Class A3, Animal carcinogen; EPA - Class B2, Probable human carcinogen based on animal studies; MAK - Class B, Justifiably suspected of having carcinogenic potential.

Chronic Effects: These compounds may penetrate into the human body by cutaneous, respiratory or digestive exposure. People occupationally exposed to PCB's have relatively high PCB residue levels in blood plasma. Symptoms include chloracne dermatitis and degreasing the skin, pigmentation of skin and nails, excessive eye discharge, swelling of eyelids, transient visual disturbances, distinctive hair follicles, edema of the face and hands.

In common with other polyhalogenated aromatic hydrocarbons, the chlorinated biphenyls exhibit dioxin-like behavior. Polyhalogenated aromatic hydrocarbons (PHAHs) comprise two major groups.

The first group represented by the halogenated derivatives of dibenzodioxins (the chlorinated form is PCDD), dibenzofurans (PCDF) and biphenyls (PCB) exert their toxic effect (as hepatoxicants, reproductive toxicants, immunotoxicants and procarcinogens) by interaction with a cytostolic protein known as the Ah receptor. In guinea pigs the Ah receptor is active in a mechanism which "pumps" PHAH into the cell whilst in humans the reverse appears to true. This, in part, may account for species differences often cited in the literature. This receptor exhibits an affinity for the planar members of this group and carries these to the cellular nucleus where they bind, reversibly, to specific genomes on DNA.

This results in the regulation of the production of certain proteins which elicit the toxic response. The potency of the effect is dependent on the strength of the original interaction with the Ah receptor and is influenced by the degree of substitution by the halogen and the position of such substitutions on the parent compound.

The most potent molecule is 2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD) while the coplanar PCBs (including mono-ortho coplanars) possess approximately 1% of this potency. Nevertheless, all are said to exhibit "dioxin-like" behavior and in environmental and health assessments it has been the practice to assign each a TCDD-equivalence value.

The most subtle and important biological effects of the PHAHs are the effects on endocrine hormones and vitamin homeostasis. TCDD mimics the effect of thyroxin (a key metamorphosis signal during maturation) and may disrupt patterns of embryonic development at critical stages. Individuals from exposed wildlife populations have been observed to have altered sexual development, sexual dysfunction as adults and immune system suppression.

Immunotoxic effects of the PHAHs (including the brominated congener, PBB) have been the subject of several studies. No clear pattern emerges in human studies however with T-cell numbers and function (a blood marker for immunological response) increasing in some and decreasing in others.

Three incidences have occurred which have introduced abnormally high levels of dioxin or dioxin-like congeners to humans. The explosion at a trichlorophenol-manufacturing plant in Seveso, Italy distributed TCDD across a large area of the country-side, while rice-oil contaminated with heat-transfer PCBs (and dioxin-like contaminants) has been consumed by two groups, on separate occasions (one in Yusho, Japan and another in Yu-cheng, Taiwan). The only symptom which can unequivocally be related to all these exposures is the development of chloracne, a disfiguring skin condition, following each incident. Contaminated oil poisonings also produced eye-discharge, swelling of eyelids and visual disturbances. The Babies born up to 3 years after maternal exposure (so-called "Yusho-babies") were characteristically brown skinned, colored gums and nails and (frequently) produced eye-discharges. Delays in intellectual development have been noted. It has been estimated that Yu-cheng patients consumed an average level of 0.06 mg/kg body weight/day total PCB and 0.0002 mg/kg/day of PCDF before the onset of symptoms after 2 months. When the oil was withdrawn after 6 months they had consumed 1 gm total PCB containing 3.8 mg [illegible] data from the Yusho cohort suggests a six-fold excess of liver cancer mortality in males and a three-[illegible] women.

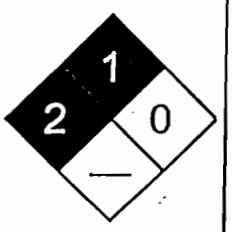
Recent findings from Seveso indicate that the biological effects of low level exposure (BELLEs), experienced by a cohort located at a great distance from the plant, may be hormetic, i.e. may be protective AGAINST the development of cancer.
The PHAHs do not appear to be genotoxic - they do not alter the integrity of DNA. This contrasts with the effects of the many polycyclic aromatic hydrocarbons (PAHs) (or more properly, their reactive metabolites).
Exposures as low as 0.001 ug/kg body weight/day produce carcinoma.
Several studies implicate PCBs in the development of liver cancer in workers as well as multi-site cancers in animals.
The second major group of PHAH consists of the non-planar PCB congeners which possess two or more ortho-substituted halogens. These have been shown to produce neurotoxic effects which are thought to reduce the concentration of the brain neurotransmitter, dopamine, by inhibiting certain enzyme-mediated processes.
The specific effect elicited by both classes of PHAH seems to depend on the as much on the developmental status of the organism at the time of the exposure as on the level of exposure over a lifetime.

Section 4 - First Aid Measures

Inhalation: Remove to fresh air.
Lay patient down. Keep warm and rested.
If breathing is shallow or has stopped, ensure clear airway and apply resuscitation. Transport to hospital or doctor.
Eye Contact: Immediately hold the eyes open and flush continuously for at least 15 minutes with fresh running water.
Ensure irrigation under eyelids by occasionally lifting the upper and lower lids.
Transport to hospital or doctor without delay. Removal of contact lenses after an eye injury should only be undertaken by skilled personnel.
Skin Contact: Immediately remove all contaminated clothing, including footwear (after rinsing with water).
Wash affected areas thoroughly with water (and soap if available).
Seek medical attention in event of irritation.
Ingestion: Contact a Poison Control Center. DO NOT induce vomiting. Observe the patient carefully. Never give liquid to a person showing signs of being sleepy or with reduced awareness; i.e. becoming unconscious. Give water (or milk) to rinse out mouth. Then provide liquid slowly and as much as casualty can comfortably drink. Transport to hospital or doctor without delay.
After first aid, get appropriate in-plant, paramedic, or community medical support.
Note to Physicians: Treat symptomatically. If large amounts are ingested, gastric lavage is suggested. In the case of splashes in the eyes, a petrolatum-based ophthalmic ointment may be applied to the eye to relieve the irritating effects of PCBs. If electrical equipment arcs over, PCB dielectric fluids may decompose to produce hydrogen chloride (HCl), a respiratory irritant.
Preplacement and annual medical examinations of workers, with emphasis on liver function, skin condition, reproductive history, are recommended.

Section 5 - Fire-Fighting Measures

Flash Point: > 141.111 °C
Autoignition Temperature: Not applicable
LEL: Not applicable
UEL: Not applicable
Extinguishing Media: Foam. Alcohol stable foam.
Dry chemical powder.
General Fire Hazards/Hazardous Combustion Products: POLLUTANT -contain spillage.
Noncombustible liquid.
Decomposes on heating and produces acrid black soot and toxic fumes of aldehydes, hydrogen chloride (HCl), chlorides and extremely toxic polychlorinated dibenzofuran (PCDF), polychlorinated dibenzodioxin (PCDD).



Fire Diamond

Fire Incompatibility: Reacts vigorously with chlorine (Cl2).
Fire-Fighting Instructions: POLLUTANT -contain spillage. Noncombustible.
Clear area of personnel and move upwind.
Contact fire department and tell them location and nature of hazard.
Wear full body protective clothing with breathing apparatus. Prevent, by any means available, spillage from entering drains or waterways.
Use fire fighting procedures suitable for surrounding area.
Cool fire-exposed containers with water spray from a protected location.
Avoid spraying water onto liquid pools.
If safe to do so, remove containers from path of fire.
Equipment should be thoroughly decontaminated after use.

Section 6 - Accidental Release Measures

Small Spills: Clean up all spills immediately. POLLUTANT -contain spillage.

Environmental hazard - contain spillage.
Avoid breathing vapors and contact with skin and eyes.
Wear protective clothing, impervious gloves and safety glasses.
Contain spill with sand, earth or vermiculite.
Wipe up and absorb small quantities with vermiculite or other absorbent material.
Place spilled material in clean, dry, sealable, labeled container.
Large Spills: POLLUTANT -contain spillage. Clear area of personnel.
Contact fire department and tell them location and nature of hazard.
Wear full body protective clothing with breathing apparatus. Prevent, by any means available, spillage from entering drains or waterways.
Stop leak if safe to do so.
Contain spill with sand, earth or vermiculite.
Collect recoverable product into labeled containers for recycling.
Absorb remaining product with sand, earth or vermiculite.
Collect residues and seal in labeled drums for disposal.
After clean-up operations, decontaminate and launder all protective clothing and equipment before storing and reusing.
If equipment is grossly contaminated, decontaminate and destroy.
If contamination of drains or waterways occurs, advise emergency services.
Regulatory Requirements: Follow applicable OSHA regulations (29 CFR 1910.120).

Section 7 - Handling and Storage

Handling Precautions: Use good occupational work practices. Observe manufacturer's storing and handling recommendations.
Atmosphere should be regularly checked against established exposure standards to ensure safe working conditions are maintained.
Avoid all personal contact, including inhalation.
Wear protective clothing and gloves when handling containers.
Avoid physical damage to containers.
Handle gently.
Use in a well-ventilated area.
Local exhaust ventilation may be required for safe working, i.e. to keep exposures below required standards; otherwise, PPE is required.
Use only in completely enclosed system.
Avoid contact with incompatible materials.
When handling, DO NOT eat, drink or smoke.
Wash hands with soap and water after handling.
Work clothes should be laundered separately: NOT at home.
Recommended Storage Methods: Packaging as recommended by manufacturer.
Check that containers are clearly labeled.
Metal can.
Metal drum.
Steel drum with plastic liner.
Regulatory Requirements: Follow applicable OSHA regulations.

Section 8 - Exposure Controls / Personal Protection

Engineering Controls: Provide adequate ventilation in warehouse or closed storage areas.
If inhalation risk of overexposure exists, wear NIOSH-approved organic-vapor respirator.
In confined spaces where there is inadequate ventilation, wear full-face air supplied breathing apparatus.
Personal Protective Clothing/Equipment
Eyes: Safety glasses with side shields; chemical goggles.
Full face shield.
Contact lenses pose a special hazard; soft lenses may absorb irritants and all lenses concentrate them.
Hands/Feet: Impervious gloves; Viton gloves.
Polyethylene gloves.
PVC gloves.
Protective footwear.
Respiratory Protection:
Exposure Range >0.5 to <5 ppm: Supplied Air, Constant Flow/Pressure Demand, Full Face
Exposure Range 5 to unlimited ppm: Self-contained Breathing Apparatus, Pressure Demand, Full Face
Note: odor threshold unknown
Other: Impervious protective clothing. Overalls.
Impervious apron.
Eyewash unit.

Ensure there is ready access to a safety shower.

Section 9 - Physical and Chemical Properties

Appearance/General Info: Clear, almost colorless, mobile oily liquid. Soluble in organic solvents and lipids. PCB's are resistant to chemical and biological degradation and because of their solubility in fats and oils they tend to be concentrated in living organisms. The highly chlorinated PCB's are retained in animals' bodies longer and seem to delay the excretion of lower chlorinated PCB's. They have become widely dispersed in the world-wide environment and in the food-chain since their introduction in 1929. They are now recognized internationally to be a major environmental pollutant, their persistence causing serious ecological damage via water pollution. Consequently, loss of PCBs to the environment is to be absolutely avoided.

Physical State: Liquid
Vapor Pressure (kPa): Negligible
Vapor Density (Air=1): > 3
Formula Weight: 328.4 average
Specific Gravity (H_2O=1, at 4 °C): 1.543-1.550 at 25 °C
Water Solubility: 70 ppb
Evaporation Rate: Very Slow

pH: Not applicable
pH (1% Solution): Not applicable.
Boiling Point Range: Distillation 365 °C (689 °F) to 390 °C (734 °F)
Freezing/Melting Point Range: 10 °C (50 °F)
Volatile Component (% Vol): Nil at 38 °C
Decomposition Temperature (°C): 400

Section 10 - Stability and Reactivity

Stability/Polymerization: Product is considered stable. Hazardous polymerization will not occur. Very inert, chemically.
Storage Incompatibilities: Avoid storage with oxidizers. Segregate from chlorine.

Section 11 - Toxicological Information

Unless otherwise specified data extracted from RTECS - Registry of Toxic Effects of Chemical Substances

TOXICITY
Oral (rat) LD_{50}: 4250 mg/kg
Inhalation (human) TC_{Lo}: 10 mg/m^3

IRRITATION
Nil reported

See NIOSH, *RTECS* TQ1360000, for additional data.

Section 12 - Ecological Information

Environmental Fate: Current evidence suggests that the major source of release to the environment is an environmental cycling process of material previously introduced into the environment; this cycling process involves volatilization from ground surfaces (water, soil) into the atmosphere with subsequent removal from the atmosphere via wet/dry deposition and then revolatilization. It is a mixture of different congeners of chlorobiphenyl and the relative importance of the environmental fate mechanisms generally depends on the degree of chlorination. In general, the persistence of the PCB congeners increase with an increase in the degree of chlorination. Screening studies have shown that it is generally resistant to biodegradation. Although biodegradation may occur slowly in the environment, no other degradation mechanism have been shown to be important in natural water and soil systems; therefore, biodegradation may be the ultimate degradation process in water and soil. The PCB composition of the biodegraded Aroclor is different from the original Aroclor. If released to soil, the PCB congeners will become tightly adsorbed to the soil particles. In the presence of organic solvents, PCBs may have a tendency to leach through soil. Although the volatilization rate may be low from soil surfaces, the total loss by volatilization over time may be significant because of persistence and stability. Enrichment of the low Cl PCBs occurs in the vapor phase relative to the original Aroclor; the residue will be enriched in the PCBs containing high Cl content. If released to water, adsorption to sediment and suspended matter will be an important fate process. Although adsorption can immobilize it for relatively long periods of time, eventual resolution into the water column has been shown to occur. The PCB composition in water will be enriched in the lower chlorinated PCBs because of their greater water solubility, and the least water soluble PCBs (highest Cl content) will remain adsorbed. In the absence of adsorption, it volatilizes relatively rapidly from water. However, strong PCB adsorption competes with volatilization which may have a half-life in excess of 4 years in typical bodies of water. Although the resulting volatilization rate may be low, the total loss by volatilization over time may be significant because of persistence and stability. It has been shown to bioconcentrate significantly in aquatic organisms. If released to the atmosphere, the PCB congeners will primarily exist in the vapor-phase with enrichment of the most volatile PCBs although a relatively small percentage will partition to the particulate phase. The dominant atmospheric transformation process for these congeners is probably the vapor-phase reaction with hyd[illegible] which has estimated half-lives ranging for 3.1 months to 1.3 years. Physical removal from the atmosphere, [illegible] very important environmentally due to chemical stability, is accomplished by wet and dry deposition.

Ecotoxicity: LC_{50} Macromia (Dragonfly) 800 ug/l/7 days at 21 °C, juvenile /static bioassay; LC_{50} Bobwhite quail oral 604 ppm, in 5-day diet, (95% confidence limit 410-840 ppm), age 10 days; LC_{50} Gammarus fasciatus (Scud) 2400 ug/l/96 hr at 21 °C, mature /static bioassay; LC_{50} Ischnura venticalis (Damselfly) 200 ug/l/96 hr at 15 °C, juvenile /static bioassay; LC_{50} Perca flavescens (Yellow perch) greater than 150 ug/l/96 hr at 17 °C, wt 1.0 g /static bioassay; LD_{50} Agelaius phoeniceus (Red-winged blackbird) oral 1,500 mg/kg diet/6 day; LC_{50} Cyprinodon variegatus (sheepshead minnow), fry 0.1-0.32 ug/l/21 day /Conditions of bioassay not specified; LC_{50} Leiostomus xanthurus (spot) 0.5 ug/l/38 day /Conditions of bioassay not specified; LD_{50} Mustela vison (mink) oral 4.0 mg/kg; LC_{50} Penaeus duorarum (pink shrimp) 1.0 ug/l/12 day /Conditions of bioassay not specified; LC_{50} Palaemonetes pugio (grass shrimp) 6.1-7.8 ug/l/96 hr /Conditions of bioassay not specified; LC_{50} Hydra oligactis (hydra) 10,000 ug/l/72 hr /Conditions of bioassay not specified; LC_{50} Lepomis macrochius (Bluegill) 2740 ug/l/96 hr at 18 °C (95% confidence limit 1294-5810 ug/l), wt 0.8 g /static bioassay; LD_{50} Sturnus vulgaris (European starling) oral 1,500 mg/kg diet/96 hr

Henry's Law Constant: 5×10^{-5}

BCF: mullett 1254

Octanol/Water Partition Coefficient: log K_{ow} = estimated at 6.30

Soil Sorption Partition Coefficient: $K_{oc} = 4.25 \times 10^{4}$

Section 13 - Disposal Considerations

Disposal: Recycle wherever possible. Consult manufacturer for recycling options.
Follow applicable federal, state, and local regulations.
Due to their environmental persistence and potential health hazards, PCBs cannot be disposed of in landfills or dumped at sea. The only environmentally acceptable method for the disposal of PCBs is by high temperature incineration.
All wastes and residues containing PCB's (e.g., wiping cloths, absorbent material, used disposable protective gloves, contaminated clothing, etc.) should be collected, placed in proper containers, labelled and disposed of in accordance with applicable regulations.

Section 14 - Transport Information

DOT Transportation Data (49 CFR 172.101):

Shipping Name: POLYCHLORINATED BIPHENYLS

Additional Shipping Information: PCB'S

Hazard Class: 9

ID No.: 2315

Packing Group: II

Label: Miscellaneous Dangerous Goods[9]

Section 15 - Regulatory Information

EPA Regulations:

RCRA 40 CFR: Not listed

CERCLA 40 CFR 302.4: Listed per CWA Section 311(b)(4); per CWA Section 307(a) 1 lb (0.454 kg)

SARA 40 CFR 372.65: Listed as Compound

SARA EHS 40 CFR 355: Not listed

TSCA: Not listed

Section 16 - Other Information

Research Date:.....1999-11 **Review Date:** 2000-07

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ATTACHMENT 3
SAFETY AND HEALTH FORMS

Conti Environmental, Inc

Certificate of Worker/Visitor Acknowledgement

Project Name:	Worker/Visitor:

The contract for the above project requires the following: that you be provided with and complete formal and site-specific training; that you be supplied with proper personal protective equipment including respirators; that you be trained in its use; and that you receive a medical examination to evaluate your physical capacity to perform your assigned work tasks, under the environmental conditions expected, while wearing the required personal protective equipment. These things are to be done at no cost to you. By signing this certification, you are acknowledging that your employer has met these obligations to you.

Site Required Training/Medical

Training	Date
40-Hour HAZWOPER: I have completed the formal OSHA training course	
3-Day Actual Field Experience: I have completed three days actual field experience under the direct supervision of a HAZWOPER trained, experienced supervisor.	
8-Hour HAZWOPER Supervisory: I have completed the formal OSHA training courses	
8-Hour HAZWOPER Annual Refresher: I have completed the formal OSHA training course.	
Site-Specific Training: I have been provided and have completed the site-specific training required by this SSHP. The Site safety and Health Officer conducted the training.	
Confined Space Entry Training: I have completed the OSHA formal course	
Respiratory Protection: I have been trained In accordance with the criteria in Conti's Respiratory Protection Program. I have been trained in the proper work procedures and limitations of the respirator (s) I will wear. I have been trained in and use and will abide by the facial hair policy.	
Respirator Fit-Test Training: I have been trained in the proper selection fit, use, care, cleaning, and maintenance, and storage of the respirator (s) that I will wear. I have been fit-tested in accordance with the criteria in Conti's Respiratory Program and have received a satisfactory fit. I have been taught how to properly perform positive and negative pressure fit-check upon donning negative pressure respirators each time.	
Medical Examination: I have had a medical examination within the last twelve months which was paid for by my employer. The examination included: health history, pulmonary Function tests and may have included an evaluation of a chest array. A physician made determination regarding my physical capacity to perform work tasks on the project while wearing protective equipment including a respirator. I was personally provided a copy and informed of the results of that examination. I have been provided with a medical certification by the occupational physician and the occupational physician has determined that there: ____ Were no limitations to performing the required work tasks; ____ Were identified physical limitations to performing the required work tasks	

I HAVE READ, UNDERSTAND AND AGREE TO FOLLOW THE SITE SAFETY AND HEALTH PLAN FOR THIS SITE.

Worker/Visitor Signature:		Social Security Number:	Date:
Site Safety and Health Officer:	Signature:	Social Security Number:	Date:

Conti Environmental, Inc
Safety and Health Revision Request Form

Project Number:	Project Name:	Project Supervisor:

Revision Subject:

Revision Information

Recommended Revision:

Justification of Revision:

Submitted By

Name:	Title:
Signature:	Date:

Approval

☐ Approved ☐ Disapproved	Comment:

Name:	Title:
Signature:	Date:

Conti Environmental, Inc
Daily Safety and Inspection Log

Project Number:	Project Name:	Project Supervisor:
02027	**Griffiss Landfill Cover Improvements**	**Rich Hamlin**

Date:	**Weather Condition:**

Summary of Day's Work Activity:

Violations of the Site Safety and Health Plan:

Protective Clothing and Equipment Being Used by Task:

Physical Condition of Workers (any heat or cold stress or other medical problems):

Accidents or Breach of Procedures:

Description of Monitoring and Air sampling Taken:

Miscellaneous:

Name:	**Title:**
Signature:	Date:

Conti Environmental, Inc.
Equipment Inspection Form

Date:	Project Name.:	Project No.:
Equipment Make & Model:	Equipment No:	Equipment Hours:

This form is to be used for the initial equipment inspection upon arrival at the project and Daily inspection during use. Corrective actions are required for all deficiencies noted during the inspections.

EQUIPMENT CHECKLIST

Inspection Item	*Yes*	*No*	*Comment/Corrective Action*
Fluid Level?			
Horn Operable?			
Emergency/Parking Brake System?			
Hydraulic System Operable w/No leaks?			
Engine and Transmission			
Parking Brake System?			
Headlights Operable?			
Taillights Operable?			
Brake Lights Operable?			
Audible (Reverse) Alarm System?			
Unobstructed rear View?			
Windshields?			
Windshield Wipers and Washer Fluid?			
Defroster/Defogger?			
Cab Shield or Canopy?			
Seatbelts Available and Used?			
Fire Extinguishers?			
Rear View Mirror?			
Fender/Mud Flaps?			

Comments

Inspection Performed By:	Date:

Conti Environmental, Inc.
Daily Air Monitoring Report

Project Number:	Project Name:	Project Supervisor:
02027	Griffiss Landfill Cover Improvements	Rich Hamlin

Date:	Work Location and Task:

Instrument (Name, Model and Serial No.

Calibration Data

	VOC	LEL	O2	H2S
Span Gas Concentration				
Instrument Reading				

Air Monitoring Data

Time	Location	VOC	LEL	O2	H2S

Comments:

Name:	Title:
Signature:	Date:

Daily Air Monitoring Report (Cont.)

Project Number: 02027	Project Name: Griffiss Landfill Cover Improvements	Project Supervisor: Rich Hamlin

Date:

Work Location and Task:

Instrument (Name, Model and Serial No.

Air Monitoring Data

Time	Location	VOC	LEL	O2	H2S

Signature:

Date:

Tool-Box Safety Briefing Sheet

Date:	Project: Griffiss Landfill Cover Improvements

Topics of Toolbox Safety Meeting

- ☐ Hardhats and Safety Shoes
- ☐ Eye & Ear Protection
- ☐ Work Zones and Site Control
- ☐ Heat and Cold Stress
- ☐ Designated Smoking Zone
- ☐ Review Previous Accidents
- ☐ Accident Reporting/Investigation
- ☐ Activity Hazard Analysis _____
- ☐ Activity Hazard Analysis _____
- ☐ Ladder for Excavation
- ☐ Entering Excavation
- ☐ Confined Space Entry
- ☐ Ground Fault Interrupters
- ☐ First Aid and Fire Protection
- ☐ Hazardous Communication
- ☐ Fall Protection (6 Foot Rule)
- ☐ Activity Hazard Analysis _____
- ☐ Other_____

Site Specific Hazards

Attendees

Name	Signature	Company

Daily Operations

Site Safety and Health Officer:

Conti Environmental, Inc
Equipment Decontamination Log

Project Number:	Project Name:	Project Supervisor:

Equipment Description	Equipment Number	Date Decontaminate	Date Demob

Comments:

Site Safety and Health Officer	Signature

Conti Environmental, Inc
Site Entry and Exit Log

Project Number:	Project Name:	Project Supervisor:
00127	**General gas Mantle Building Demolition**	**Charlie McNeil**

Employee Name	Company	Task	Time In	Time Out

Comments:

Site Safety and Health Officer	
Signature	

Conti Environmental, Inc
Site Entry and Exit Log

Project Number:	Project Name:	Project Supervisor:

Employee Name	Company	Task	Time In	Time Out

Conti Environmental, Inc.
Hot Work Permit

Date:	Time: Begin	Time: End
Project Number:	Project Name:	Project Supervisor:

Operating Area:

Work To Be Done:

AREA PREPARATION	Y	N
Is the equipment or area satisfactorily cleaned for **Flammable/Combustibles?**		
Is the adjoining operations or equipment considered **OK** from the standpoint of possible effect on the job?		
Have Flammable/Combustibles been located at least **35 feet** from the operation?		
Have non-movable Flammable/Combustibles been protected fireproof curtains or covers?		
Have requirements of other procedures been met? **(Lock Out, Confined Space Entry, etc.)**		
Are proper fire extinguishers on the job? **(20 lb. ABC)**		
Is sprinkler system operable? (If applicable)		
Is water house laid out and water running? (If applicable)		
Are tarps needed to protect adjoining areas or personnel from sparks or arc flashes?		
Is supply of fresh air needed for confined areas?		
Are lower floors, pipe chases, floor drains protected?		
Other precautions? **(Protective clothing and/or equipment, signs posted)**		
Has a fire watch been appointed to watch for dangerous sparks in the work area?		

Who is the **Fire Watch**:

AIR TESTING RESULTS

Is air testing required? ☐ Yes ☐ No

Testing Requirement	Reading	Reading	Reading	Reading	Reading	Reading
1. Time						
2. Oxygen content.						
3. Flammable concentration						

Air Monitoring Performed By:	Date:	Time:
Hot Work Permit Approve By:	Date:	Time:

Conti Environmental, Inc
Qualitative Fit Test Report

Employee Information	
Employee Name:	Date:
Employee Position/Department:	SSAN:
Test Performed By:	Title:

Respirator/Fit Test Information	
☐ Self Contained Breathing Apparatus	☐ Supplied Air Respirator
☐ Powered Air Purifying Respirator	☐ Air Purifying Respirator

☐ Clean Shaven	☐ Beard	☐ Glasses	☐ Other

	Respirator 1	Respirator 2	Respirator 3
Brand:			
Model:			
Size:			
Positive Pressure Test: (Pass/Fail)			
Negative Pressure Test: (Pass/Fail)			
Irritant Smoke Test: (Pass/Fail)			
Banana Oil Test: (Pass/Fail)			
Fit Test Result: (Pass/Fail)			

Employee Statement: I understand that my use of this respirator must be in accordance with the Tyree Health and Safety Program, Manufactures Instruction and applicable OSHA Regulations and Standards

Employee's Signature:

Tester's Signature:

ENVIRONMENTAL

CONFINED SPACE ENTRY PERMIT

Project Number:	Project Name:	Project Supervisor:
Date:	Time: Begin	Time: End
Operating Area/ Work To Be Done:		

NATURE OF HAZARDS

	Y	N
Oxygen Deficiency		
Flammable gas or Vapor		
Toxic gas or Vapors		
Mechanical Hazards		
Electrical Hazard		
Material Harmful To Skin		
Engulfment Hazards		
Welding Cutting Operations		
Other_____		

PREPARATION

	Y	N
Notify Affected Personnel		
Lockout all energy Sources		
Drained, Washed and Purged		
Ventilation to Provide Fresh Air		
Entry Procedures reviewed		
Atmosphere Test in Compliance		
Hot Work Permit		
Emergency Telephone Posted		
Other_____		

EQUIPMENT REQUIRED

	Y	N
Level of PPE		
Lifeline and Safety Harness		
Tripod and Retracting Winch		
Electrical Equipment		
Rescue Equipment		
Fire Protection Equipment		
Other_____		

Entrant:

Entrant:

Entrant:

Attendant:

Supervisor:

Police Department:	Fire Department:	Ambulance Services:	Other:_____

AIR MONITORING

	Limits	Results	Results	Results	Results	Results	Results
Time							
O2	**19.5-23.5 %**						
LEL	**10 %**						
H2S	**10 PPM**						
CO	**25 PPM**						
Other							

Confined Space Entry Authorization:	Date:	Time:

Conti Environmental, Inc.
Perimeter Air Sampling Report

General Information

Project Number:	Project Name:	Sampling Date:
02027	Griffiss Landfill Cover Improvements	

Sample Information

Sampling Location:	Sampling Location:	Sampling Location:
Instrument (Make and Model):	Instrument (Make and Model):	Instrument (Make and Model):
Serial No.:	Serial No.:	Serial No.:
Zero/Initialized (Time)	Zero/Initialized (Time)	Zero/Initialized (Time)

Time	TWA	Max	Time	TWA	Max	Time	TWA	Max

Comment:

Sampled By:	Signature:

Conti Environmental, Inc.
Personal Air Monitoring (Particulate) Report

Project Number:	Project Name:	Date:
02027	Griffiss Landfill Cover Improvement	

Work Location And Task:

MONITORING INFORMATION

Instrument (Make, Model)	Serial No.:	Zero/Calibration:

Sample I.D.	Name / SSAN Area	Start Time	Total Time	Max (mg/m3)	STEL (mg/m3)	TWA Avg. (mg/m3)

Comments:

Signature:	Date:

(For Safety Staff only)	REPORT NO.	EROC CODE	**UNITED STATES ARMY CORPS OF ENGINEERS ACCIDENT INVESTIGATION REPORT** *(For Use of this Form See Help Menu and USACE Suppl to AR 385-40)*	REQUIREMENT CONTROL SYMBOL: CEEC-S-8(R2)

1. ACCIDENT CLASSIFICATION

PERSONNEL CLASSIFICATION	INJURY/ILLNESS/FATAL	PROPERTY DAMAGE	MOTOR VEHICLE INVOLVED	DIVING
GOVERNMENT ☐ CIVILIAN ☐ MILITARY	☐	☐ FIRE INVOLVED ☐ OTHER	☐	☐
☐ CONTRACTOR	☐	☐ FIRE INVOLVED ☐ OTHER	☐	☐
☐ PUBLIC ☐ FATAL ☐ OTHER			☐	

2. PERSONAL DATA

a. Name *(Last, First, MI)*	b. AGE	c. SEX ☐ MALE ☐ FEMALE	d. SOCIAL SECURITY NUMBER	e. GRADE

f. JOB SERIES/TITLE	g. DUTY STATUS AT TIME OF ACCIDENT	h. EMPLOYMENT STATUS AT TIME OF ACCIDENT
	☐ ON DUTY ☐ TDY ☐ OFF DUTY	☐ ARMY ACTIVE ☐ ARMY RESERVE ☐ VOLUNTEER ☐ PERMANENT ☐ FOREIGN NATIONAL ☐ SEASONAL ☐ TEMPORARY ☐ STUDENT ☐ OTHER *(Specify)*

3. GENERAL INFORMATION

a. DATE OF ACCIDENT *(month/day/year)*	b. TIME OF ACCIDENT *(Military time)*	c. EXACT LOCATION OF ACCIDENT	d. CONTRACTOR'S NAME
	hrs		(1) PRIME:

e. CONTRACT NUMBER	f. TYPE OF CONTRACT	g. HAZARDOUS/TOXIC WASTE ACTIVITY	
☐ CIVIL WORKS ☐ MILITARY ☐ OTHER *(Specify)*	☐ CONSTRUCTION ☐ SERVICE ☐ A/E ☐ DREDGE ☐ OTHER *(Specify)*	☐ SUPERFUND ☐ DERP ☐ IRP ☐ OTHER *(Specify)*	(2) SUBCONTRACTOR:

4. CONSTRUCTION ACTIVITIES ONLY *(Fill in line and corresponding code number in box from list - see help menu)*

a. CONSTRUCTION ACTIVITY	(CODE)	b. TYPE OF CONSTRUCTION EQUIPMENT	(CODE)
	#		#

INJURY/ILLNESS INFORMATION *(Include name on line and corresponding code number in box for items e, f & g - see help menu)*

VERITY OF ILLNESS/INJURY	(CODE)	B. ESTIMATED DAYS LOST	C. ESTIMATED DAYS HOSPITALIZED	D. ESTIMATED DAYS RESTRICTED DUTY
	#			

e. BODY PART AFFECTED	(CODE)	g. TYPE AND SOURCE OF INJURY/ILLNESS	
PRIMARY	#		(CODE)
SECONDARY	(CODE) #	TYPE	#
f. NATURE OF ILLNESS / INJURY	(CODE) #	SOURCE	(CODE) #

6. PUBLIC FATALITY *(Fill in line and correspondence code number in box - see help menu)*

a. ACTIVITY AT TIME OF ACCIDENT	(CODE)	b. PERSONAL FLOATATION DEVICE USED?
	#	☐ YES ☐ NO ☐ N/A

7. MOTOR VEHICLE ACCIDENT

a. TYPE OF VEHICLE	b. TYPE OF COLLISION	c. SEAT BELTS	USED	NOT USED	NOT AVAILABLE
☐☐ PICKUP/VAN ☐☐ AUTOMOBILE ☐☐ TRUCK ☐☐ OTHER *(Specify)*	☐ SIDE SWIPE ☐ HEAD ON ☐ REAR END ☐ BROADSIDE ☐ ROLL OVER ☐ BACKING ☐ OTHER *(Specify)*	(1) FRONT SEAT			
		(2) REAR SEAT			

8. PROPERTY/MATERIAL INVOLVED

a. NAME OF ITEM	B. OWNERSHIP	C. $ AMOUNT OF DAMAGE
(1)		
(2)		
(3)		

9. VESSEL/FLOATING PLANT ACCIDENT *(Fill in line and correspondence code number in box from list - see help menu)*

a. TYPE OF VESSEL/FLOATING PLANT	(CODE)	b. TYPE OF COLLISION/MISHAP	(CODE)
	#		#

ACCIDENT DESCRIPTION *(Use additional paper, if necessary)*

See attached page.

11. **CAUSAL FACTOR(S)** *(Read Instruction Before Completing)*

a. (Explain YES answers in item 13)	YES	NO
DESIGN: Was design of facility, workplace or equipment a factor?	☐	☐
ISPECTION/MAINTENANCE: Were inspection & maintenance procedures a factor?	☐	☐
PERSON'S PHYSICAL CONDITION: In your opinion, was the physical condition of the person a factor?	☐	☐
OPERATING PROCEDURES: Were operating procedures a factor?	☐	☐
JOB PRACTICES: Were any job safety/health practices not followed when the accident occurred?	☐	☐
HUMAN FACTORS: Did any human factors such as, size or strength of person, etc., contribute to accident?	☐	☐
ENVIRONMENTAL FACTORS: Did heat, cold, dust, sun, glare, etc., contribute to the accident?	☐	☐

a. *(CONTINUED)*	YES	NO
CHEMICAL AND PHYSICAL AGENT FACTORS: Did exposure to chemical agents, such as dust, fumes, mists, vapors or physical agents, such as, noise, radiation, etc., contribute to accident?	☐	☐
OFFICE FACTORS: Did office setting such as, lifting office furniture, carrying, stooping, etc., contribute to the accident?	☐	☐
SUPPORT FACTORS: Were inappropriate tools/resources provided to properly perform the activity/task?	☐	☐
PERSONAL PROTECTIVE EQUIPMENT: Did the improper selection, use or maintenance of personal protective equipment contribute to the accident?	☐	☐
DRUGS/ALCOHOL: In your opinion, was drugs or alcohol a factor to the accident	☐	☐

b. WAS A WRITTEN JOB/ACTIVITY HAZARD ANALYSIS COMPLETED FOR TASK BEING PERFORMED AT TIME OF ACCIDENT?

☐ YES *(If yes, attach a copy.)* ☐ NO

12. **TRAINING**

a. WAS PERSON TRAINED TO PERFORM ACTIVITY/TASK?	b. TYPE OF TRAINING.	c. DATE OF MOST RECENT FORMAL TRAINING.
☐ YES ☐ NO	☐ CLASSROOM ☐ ON JOB	(Month) (Day) (Year)

13. **FULLY EXPLAIN WHAT ALLOWED OR CAUSED THE ACCIDENT; INCLUDE DIRECT AND INDIRECT CAUSES** *(See instruction for definition of direct and indirect causes.) (Use additional paper, if necessary)*

a. DIRECT CAUSE

See attached page.

b. INDIRECT CAUSE(S)

See attached page.

14. **ACTION(S) TAKEN, ANTICIPATED OR RECOMMENDED TO ELIMINATE CAUSE(S).**

DESCRIBE FULLY:

See attached page.

DATES FOR ACTIONS IDENTIFIED IN BLOCK 14.

a. BEGINNING (Month/Day/Year)	b. ANTICIPATED COMPLETION (Month/Day/Year)		
c. SIGNATURE AND TITLE OF SUPERVISOR COMPLETING REPORT CORPS _____ CONTRACTOR _____	d. DATE *(Mo/Da/Yr)*	e. ORGANIZATION IDENTIFIER *(Div, Br, Sect)*	f. OFFICE SYMBOL

16. **MANAGEMENT REVIEW** *(1st)*

a. ☐ CONCUR b. ☐ NON CONCUR c. COMMENTS

SIGNATURE	TITLE	DATE

17. **MANAGEMENT REVIEW** *(2nd - Chief Operations, Construction, Engineering, etc.)*

a. ☐ CONCUR b. ☐ NON CONCUR c. COMMENTS

SIGNATURE	TITLE	DATE

18. **SAFETY AND OCCUPATIONAL HEALTH OFFICE REVIEW**

a. ☐ CONCUR b. ☐ NON CONCUR c. ADDITIONAL ACTIONS/COMMENTS

SIGNATURE	TITLE	DATE

19. **COMMAND APPROVAL**

COMMENTS

COMMANDER SIGNATURE	DATE

*U.S. GOVERNMENT PRINTING OFFICE: 1993-0-791-757

10. **ACCIDENT DESCRIPTION** *(Continuation)*

a. **DIRECT CAUSE** *(Continuation)*

13b.	INDIRECT CAUSES *(Continuation)*

14.	ACTION(S) TAKEN, ANTICIPATED, OR RECOMMENDED TO ELIMINATE CAUSE(S) *(Continuation)*

OSHA's Form 300A

Summary of Work-Related Injuries and Illnesses

Year 20__ __

U.S. Department of Labor
Occupational Safety and Health Administration

Form approved OMB no. 1218-0176

All establishments covered by Part 1904 must complete this Summary page, even if no work-related injuries or illnesses occurred during the year. Remember to review the Log to verify that the entries are complete and accurate before completing this summary.

Using the Log, count the individual entries you made for each category. Then write the totals below, making sure you've added the entries from every page of the Log. If you had no cases, write "0."

Employees, former employees, and their representatives have the right to review the OSHA Form 300 in its entirety. They also have limited access to the OSHA Form 301 or its equivalent. See 29 CFR Part 1904.35, in OSHA's recordkeeping rule, for further details on the access provisions for these forms.

Number of Cases

Total number of deaths	Total number of cases with days away from work	Total number of cases with job transfer or restriction	Total number of other recordable cases
_____	_____	_____	_____
(G)	(H)	(I)	(J)

Number of Days

Total number of days of job transfer or restriction	Total number of days away from work
_____	_____
(K)	(L)

Injury and Illness Types

Total number of . . .	(M)		
(1) Injuries	_____	(4) Respiratory conditions	_____
		(5) Poisonings	_____
(2) Musculoskeletal disorders	_____	(6) Hearing loss cases	_____
(3) Skin disorders	_____	(7) All other illnesses	_____

Establishment Information

Your establishment name _____

Street _____

City _____ State _____ ZIP _____

Industry description (*e.g., Manufacture of motor truck trailers*)

_____

Standard Industrial Classification (SIC), if known (*e.g., SIC 3715*)

____ ____ ____ ____

Employment Information *(If you don't have these figures, see the Worksheet on the back of this page to estimate.)*

Annual average number of employees _____

Total hours worked by all employees last year _____

Sign here

Knowingly falsifying this document may result in a fine.

I certify that I have examined this document and that to the best of my knowledge the entries are true, accurate, and complete.

_____ _____
Company executive Title

( ) - / /
Phone Date

Post this Summary page from February 1 to April 30 of the year following the year covered by the form.

OSHA's Form 300

Log of Work-Related Injuries and Illnesses

Attention: This form contains information relating to employee health and must be used in a manner that protects the confidentiality of employees to the extent possible while the information is being used for occupational safety and health purposes.

Year 20__ __

U.S. Department of Labor
Occupational Safety and Health Administration

Form approved OMB no. 1218-0176

You must record information about every work-related death and about every work-related injury or illness that involves loss of consciousness, restricted work activity or job transfer, days away from work, or medical treatment beyond first aid. You must also record significant work-related injuries and illnesses that are diagnosed by a physician or licensed health care professional. You must also record work-related injuries and illnesses that meet any of the specific recording criteria listed in 29 CFR Part 1904 8 through 1904 12. Feel free to use two lines for a single case if you need to. You must complete an Injury and Illness Incident Report (OSHA Form 301) or equivalent form for each injury or illness recorded on this form. If you're not sure whether a case is recordable, call your local OSHA office for help.

Establishment name ________________

City ________________ State ________

Identify the person			Describe the case			Classify the case												
(A) Case no.	(B) Employee's name	(C) Job title (e.g., *Welder*)	(D) Date of injury or onset of illness	(E) Where the event occurred (*e.g., Loading dock north end*)	(F) Describe injury or illness, parts of body affected, and object/substance that directly injured or made person ill (*e.g., Second degree burns on right forearm from acetylene torch*)	Using these four categories, check ONLY the most serious result for each case:				Enter the number of days the injured or ill worker was:		Check the "Injury" column or choose one type of illness: (M)						
						Death (G)	Days away from work (H)	Remained at work: Job transfer or restriction (I)	Remained at work: Other recordable cases (J)	On job transfer or restriction (K)	Away from work (L)	Injury (1)	Musculoskeletal disorder (2)	Skin disorder (3)	Respiratory condition (4)	Poisoning (5)	Hearing loss (6)	All other illnesses (7)
			/ month/day			☐	☐	☐	☐	__ days	__ days	☐	☐	☐	☐	☐	☐	☐
			/ month/day			☐	☐	☐	☐	__ days	__ days	☐	☐	☐	☐	☐	☐	☐
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			/ month/day			☐	☐	☐	☐	__ days	__ days	☐	☐	☐	☐	☐	☐	☐
					Page totals ➤	___	___	___	___	___	___	Injury (1)	Musculoskeletal disorder (2)	Skin disorder (3)	Respiratory condition (4)	Poisoning (5)	Hearing loss (6)	All other illnesses (7)

Be sure to transfer these totals to the Summary page (Form 300A) before you post it