

Army Corps Engineers

DRAFT

ENVIRONMENTAL HEALTH AND SAFETY PLAN

FOR

DEBRIS TRANSFER, STAGING, SORTING/SIFTING

AND DISPOSAL OPERATION, STATEN ISLAND

LANDFILL

Prepared for Preliminary Review. This document is a REVIEW DRAFT. It has not been formally released and should be construed to represent a final document.

(Figure 1 – Not Included to be submitted separately for acceptance)

October 12, 2001

VERSION 4.0

TABLE OF CONTENTS

SECTION 1.0 – INTRODUCTION AND SCOPE.....	1
1.1 INTRODUCTION	1.
1.1.1 <u>Scope and Applicability of the Plan</u>	1
1.1.2 <u>Plan Objectives</u>	2
1.1.3 <u>Communication</u>	3
SECTION 2.0 - SITE CONTROL	4.
2.1 LANDFILL ENTRY	4.
2.2 EXCLUSION ZONE	5.
2.3 PERSONAL HYGIENE STATION	5
2.4 NON-REGULATED AREAS	5
2.5 DESIGNATED TRAFFIC ZONES.....	6
2.6 VEHICLE WASHING STATION	7.
SECTION 3.0 - ACTIVITY HAZARD ANALYSIS	8
3.1 HAND SORTERS	8.
3.2 GRAPPLE/TRACKHOE OPERATORS.....	10
3.3 FRONT-END LOADER OPERATORS.....	11
3.4 DOZER OPERATORS.....	13
3.5 TRUCK OPERATORS.....	14
3.6 MECHANICAL SEPARATOR SORTERS	16
3.7 TORCH CUTTERS	18
3.8 SITE MANAGERS AND FIELD SUPPORT PERSONNEL	19
3.9 MECHANICAL CUTTERS	21
3.10 INDUSTRIAL HYGIENE TECHNICIANS/SAFETY MONITORS.....	23
SECTION 4 - HAZARD CONTROL PROGRAM.....	25
4.1 GENERAL HAZARDS AT MUNICIPAL SOLID WASTE LANDFILLS	25
4.2 PHYSICAL HAZARDS.....	26
4.2.1 <u>Noise</u>	26
4.2.2 <u>Fire</u>	26
4.2.4 <u>Site Vehicle Safety</u>	28
4.2.5 <u>Heat/Cold Stress</u>	28
4.2.6 <u>Lockout/Tagout Program</u>	37
4.2.7 <u>Conveyors</u>	37
4.2.8 <u>Other Physical Hazards</u>	42
4.2.9 <u>Gas Extraction Well Heads</u>	43
4.2.10 <u>Grounding and Lightning</u>	43
4.3.11 <u>Confined Spaces</u>	44
4.3 CHEMICAL HAZARDS	45
4.3.1 <u>Asbestos</u>	45
4.3.2 <u>Silica Dust and Particulate Matter Not Otherwise Specified</u>	46
4.3.3 <u>Landfill Chemical Agents</u>	46
4.3.4 <u>Other Chemical Agents</u>	48
4.4 BIOLOGICAL HAZARDS.....	49
4.4.1 <u>Route of Exposure</u>	49
4.5 OTHER SITE HAZARDS	50
4.5.1 <u>Helicopter Landing Area</u>	50

Staten Island Landfill Debris Disposal Operation

Table of Contents

	4.5.2 <u>Barge Operations</u>	50
4.6	PERSONAL PROTECTIVE EQUIPMENT (PPE).....	51
	4.6.1 <u>Levels of Protection</u>	51
4.7	MONITORING.....	53
	4.7.1 <u>Air Monitoring</u>	53
	4.7.2 <u>Information Management And Dissemination</u>	56
	4.7.3 <u>Site Safety Monitoring</u>	57
	7.7.4 <u>Monitoring Activities By Agencies</u>	60
SECTION 5.0	– RESPIRATORY PROTECTION PROGRAM	63
5.1	PURPOSE.....	63
5.2	APPLICABILITY AND RESPONSIBILITY.....	63
5.3	TRAINING.....	63
5.4	RESPIRATORY SELECTION.....	64
5.5	MEDICAL SURVEILLANCE	64
5.6	RESPIRATOR FIT TESTING	64
5.7	RESPIRATOR INSPECTION AND MAINTENANCE	64
SECTION 6.0	- COMMUNICATION & ACCIDENT PREVENTION	65
6.1	SITE COMMUNICATION.....	65
	6.1.1 <u>Key Personnel</u>	65
6.2	COORDINATING AND CONTROLLING WORK ACTIVITIES	66
	6.1.1 <u>Visitors and Unknown Site Representatives</u>	67
6.3	REPORTING PROCEDURES.....	68
	6.3.1 <u>Investigation and Reporting of Accidents</u>	68
	6.3.2 <u>Exposure Reporting</u>	68
	6.3.3 <u>Maintenance of Data Logs</u>	68
6.4	EMERGENCY RESPONSE.....	68
	6.4.1 <u>Emergency Medical Care</u>	69

SECTION 1.0 – INTRODUCTION AND SCOPE

1.1 INTRODUCTION

1.1.1 Scope and Applicability of the Plan

This Health and Safety Plan (plan) provides onsite personnel with guidance for identifying unique or significant safety and health hazards that may be associated with the World Trade Center debris sorting operations at the Staten Island landfill in Staten Island, New York. The Staten Island Landfill Complex is one of the largest landfills in the United States. Established in 1948, the site covers over 2,200 acres on the western shore of Staten Island.

Users of this plan are cautioned to utilize the information provided with clear knowledge of specific project requirements and professional judgement. While every attempt has been made to identify hazards of special concern, the plan is not intended to be an all-encompassing analysis identifying each and every physical, chemical, or biological hazard that could possibly be encountered. It is critical for the user, especially those with less professional safety and health training or knowledge, to recognize that the hazard analyses presented in this plan are starting points rather than end points. Each hazard analysis presented must be considered generic and not specific to actual site conditions. Each agency/contractor will be responsible for developing site specific job hazard assessments for their employees, as well as a site-specific Health and Safety Plan.

This plan was developed to provide a site-wide mechanism for the coordination of Health and Safety for most site operations. The purpose of this manual is to facilitate the cooperation of all government and private entities working on the site so that health and safety of all site workers is a priority when conducting the various work tasks at the site. The following entities have contributed to the development of this document:

- U.S. Environmental Protection Agency (USEPA)
 - Federal Bureau of Investigation (FBI)
 - U.S. Coast Guard (USCG)
 - U.S. Army Corps of Engineers (USACE)
-

Staten Island Landfill Debris Disposal Operation**Health and Safety Program**

- U.S. Secret Service
- U.S. Occupational Safety and Health Administration (OSHA)
- New York Police Department (NYPD)
- New York City Department of Sanitation (DSNY)
- N.Y. City Department of Health (NYCDOH)
- N.Y State Department of Environmental Conservation (NYSDEC)
- Phillips & Jordan (P&J)
- Evans Environmental & Geosciences (EE&G)

Workers shall be informed of the site emergency response procedures and potential health or safety and exposure hazards of the project by their respective agencies or employers. Unsafe conditions or situations that may pose immediate danger to life and health will be reported to the designated agency representatives to allow for proper employee notification.

Site workers need to understand that the sorting operation is a crime scene; therefore the FBI and NYPD have authority with respect to site operational activities. Phillips and Jordan is the Construction Manager of the work site, and EE&G is serving as Health and Safety facilitators for the Work Site.

1.1.2 Plan Objectives

The primary objectives of this plan are as follows:

- Identify potential hazards at the work site.
- Establish a minimum basis for assessing that the personal protection equipment (PPE) provided is adequate to protect onsite workers within controlled areas.
- Establish a satisfactory level of PPE to minimize the potential for site workers to be exposed to potential air-borne hazards above applicable exposure criteria and minimize the potential for injuries or accidents to site workers.

Staten Island Landfill Debris Disposal Operation**Health and Safety Program**

- Facilitate the cooperation of the numerous governmental and private entities with a presence on the site such that all site workers are as safe as reasonably possible.
- Provide a set of minimum safety and health standards to be followed by personnel onsite. It is understood that agencies present onsite have their own health and safety requirements. It is the intention of this plan to compliment the health and safety plans developed and used by individual agencies and/or private contractors/subcontractors, while establishing minimum standards that will be observed by the general site population.

While onsite, health and safety – related practices will be governed by OSHA regulations and the USACE's Safety and Health Requirements Manual (EM 385-1-1 September 3, 1996). In the event that a conflict exists between these two documents, work practices on this site will be governed by EM 385-1-1.

1.1.3 Communication

Onsite communication will be accomplished utilizing a series of meetings and/or briefings. It is understood that all agencies, contractors, and employers will disseminate appropriate information to their own employees. There will be a daily site safety meeting to provide a method for communicating observations, information, and planned operational changes to the site. The daily site safety meeting will be conducted at 11:00 am in the FBI safety trailer. Should meeting times change, updates will be distributed prior to time change. Additionally, changes or addenda to this plan, if made, will be distributed to the agencies during these meetings. Attendance at these meetings shall be limited to one health and safety officer/representative per agency, one representative from P&J, and one representative from EE&G. This is mainly due to space limitations. In the event that special discussions or issues are scheduled to be addressed, attendance restrictions may be modified to accommodate these conditions. P&J will conduct separate safety meetings with their subcontractors.

SECTION 2.0 - SITE CONTROL

The existing nature of the debris disposal operation creates a need for site control. The purpose of this section is to describe the components associated with site control in an attempt to minimize personnel exposure to potential chemical and physical hazards and off-site tracking of chemical hazards by site personnel. Several of the areas described below may change as site conditions change and its important that the onsite management personnel support the demarcation associated with this plan and develop an appreciation for the fluid nature of the controlled areas as onsite operations change.

2.1 LANDFILL ENTRY

Entry to the Staten Island Landfill site will be controlled using an ID-type system. The specifics of this system have not yet been developed. At the time this plan was generated, the following non-federal law enforcement/emergency management badges were generally provided working access to the site:

- Federal Emergency Management Association (FEMA).
- World Trade Center Badge Security Badge.
- Phillips and Jordan ID Badge, which has generally been distributed to their employees and subcontractors.
- NYPD vehicle dashboard passes.

Additionally, other Federal organizations and local law enforcement may be visiting the site. Coordination with the entry point will be conducted to limit access to only operation-associated personnel.

2.2 EXCLUSION ZONE

The Exclusion Zone is the area of greatest potential for worker exposure to chemical and physical agents or hazards. Snow fence, orange highway cones, appropriate signage, or a combination of all three will be used to demarcate this area. Access to the exclusion zone will be controlled and only workers wearing appropriate PPE will be permitted entry. The Exclusion Zones are shown in Figure 1, and generally consist of the debris storage areas and the areas containing the sifting/sorting operations and Building 7 operations. Personnel exiting the exclusion zone will be generally allowed to exit the area in their PPE except for the following conditions:

- Personnel going to the mess area.
- Personnel leaving the site.
- Personnel going into one of the onsite trailers, buildings, or tents.

Upon exiting the exclusion zone for one of the above conditions, personnel shall proceed to the personal hygiene station for cleanup.

2.3 PERSONAL HYGIENE STATION

Personal hygiene stations (PHS) have been established adjacent to the work area to promote good worker hygiene practices. This area has been provided by a joint effort by the U.S. Environmental Protection Agency (EPA) and the U.S. Coast Guard (USCG). Personnel should be directed to the PHS following work in the exclusion zone. Access to the mess area is through the PHS. Additionally, three hand-wash stations have been provided temporarily by the National Guard. These hand wash stations are adjacent to the mess area.

2.4 NON-REGULATED AREAS

Other areas of the landfill property are generally described as non-regulated areas. This designation has been given to areas (where respirators and protective clothing are not required) that are not included in the exclusion zone. It is understood that the minimum PPE described in Section

4.6 (steel-toed boots, hardhats, safety glasses, safety vests, and hearing protection) shall apply for all non-regulated areas on the "hill-top". Respiratory protection and protective clothing is required in the exclusion zone. For the purposes of this plan, the non-regulated areas generally consist of the following:

- Designated traffic zones, which are described in the next section.
- Command trailer areas.
- Mess areas.
- Medical areas.
- Support structures.

Despite the proximity to the exclusion zones, the appropriate level of PPE in these areas will likely be different than the PPE for the exclusion zone. Additionally, with the exception of the mess area and the actual trailers associated with the command trailer area and the medical area, the types of PPE worn by workers in these areas likely will be mixed. Personnel entering these areas may be wearing PPE from the exclusion zone. Based on the nature of the operation, the magnitude of the operation, and the limited space for non-landfilling and sorting operations, commingled personnel is inevitable, but not desirable.

EE&G has prepared a Dust Suppression Evaluation which will lead to the development of a Dust Minimization Plan to minimize the potential for fugitive dust in non-regulated areas.

2.5 DESIGNATED TRAFFIC ZONES

Designated traffic zones are areas associated with the planned movement of vehicular traffic. These areas are non-regulated areas as described above and will likely change throughout the project as landfilling and sorting operations change. Additionally, due to the hazards associated with vehicular traffic, these zones are identified separately on the site plan.

2.6 VEHICLE WASHING STATION

The USEPA and USCG have developed and implemented a mandatory vehicle-washing program to remove site-derived dust from vehicles leaving the landfill. This task was undertaken to minimize transport of site-derived material off-site. A majority of the workforce is transported to the site via buses. The buses make several trips depending on the size of the work-shift and are washed at the Transportation Authority (TA) garage. Site command and management personnel are parking vehicles in non-regulated areas. A vehicle wash station (VWS) has been established approximately 200-feet from the roadway leading up to the processing area of the landfill. Hay bails will be used to minimize migration of water into the other lane of the road. During periods of cold weather, commercially available products will be used to minimize the formation of the ice on the roadway surface. This operation will be maintained on a 24-hour basis. Vehicles that have transported debris associated with this operation exiting the landfill should use this facility prior to leaving the landfill. Modification to the VWS may be necessary at some time in the future to accommodate additional vehicular traffic.

SECTION 3.0 - ACTIVITY HAZARD ANALYSIS

The evaluation of hazards will be based upon the knowledge of site background presented in this section and anticipated risks posed by specific operations. The following describes each task/operation in terms of the specific hazards and the protective measures that should be implemented. The identifications of hazards will change as work procedures are modified. As such, this section should be considered a fluid document, and is subject to change throughout the project.

3.1 HAND SORTERS

This includes workers using hand tools to manually sift through debris on the ground. This workforce mainly includes employees of the NYPD and the FBI. These workers will be in the Exclusion Zone.

Analyzed by/Date:

Reviewed by/Date:

Principal Steps	Potential Hazards	Recommended Controls
Manually sift through debris	1) Exposure to noise in excess of 87.5 dBA. 2) Exposure to airborne asbestos and other airborne contaminants. 3) Being hit by moving vehicles. 4) Being hit by projectiles. 5) Heat/cold stress. 6) Repetitive motion disorders. 7) Slips, trips, falls. 8) Exposure to bloodborne pathogens. 9) Lacerations, puncture wounds from sharp objects.	1) Use of hearing protection with an adequate noise reduction rating to be determined from exposure monitoring. 2) Use of respiratory protection and protective clothing. 3) Use of high visibility clothing, reflective vests, and established safe distance from vehicles. 4) Use of hard hats, eye protection and safety boots. 5) Inclusion into heat/cold stress program. 6) Task rotation and education. 7) Adequate lighting at night, sand/rock salt in icy conditions, keeping main walkways clear of debris. 8) Education and use of universal precautions. 9) Use of hard hats, eye protection, work coveralls, puncture-resistant hand protection.

Staten Island Landfill Debris Disposal Operation

Health and Safety Program

Equipment to be used:

Hearing protection (level to be determined based on noise exposure monitoring), ½ face negative pressure respirators with HEPA/OV filters, protective suits, hard hats, eye protection, protective footwear as required in EM 385-1-1, 05.A.08, high visibility orange reflective vests, warm clothing.

Inspection requirements:

Daily inspection of all listed equipment should take place prior to donning. Equipment should be inspected for integrity and completeness.

Training requirements:

Hand sorters are assigned to the project on a rotational basis. Sorters will be offered to receive initial respiratory training, fit testing, and a limited medical evaluation, as a part of their site orientation, if needed.

Staten Island Landfill Debris Disposal Operation

Health and Safety Program

3.2 GRAPPLE/TRACKHOE OPERATORS

This includes workers operating equipment used to load debris onto mechanical separators. This workforce includes employees from private contractors and employees of DSNY at the barge operations.

Analyzed by/Date:

Reviewed by/Date:

Principal Steps	Potential Hazards	Recommended Controls
Equipment mounting and dismounting	1) Exposure to noise in excess of 87.5dBA. 2) Slips, trips, and fall hazards. 3) Contusion from frame of cab. 4) Injury from other vehicles. 5) Exposure to asbestos and other chemical agents. 6) Exposure to heat/cold stress.	1) Use of hearing protection with an adequate noise reduction rating to be determined from exposure monitoring. 2) Use of 3 point mounting techniques and proper footwear. 3) Use of hard hat and safety belts 4) Proper equipment spacing and training. 5) Exposure assessment through monitoring, use of respiratory protection. 6) Inclusion into heat/cold stress program.
Movement of track hoe around debris piles, sifting equipment and loading of material onto mechanical sorters.	1) Exposure to noise in excess of 87.5dBA (open cab only) 2) Injury by flying debris 3) Exposure to asbestos and other chemical agents. 4) Injury to others from operational hazards of the equipment.	1) Use of hearing protection with an adequate noise reduction rating to be determined from exposure monitoring. 2) Use of safety glasses and hard hats 3) Exposure assessment through monitoring, use of respiratory protection and protective suits. 4) Ensure people, equipment and materials are not unknowingly in the path of the boom or counterweight.

Equipment to be used:

Hearing protection (level to be determined based on noise exposure monitoring), ½ face negative pressure respirators with HEPA/OV filters, hard hats, eye protection, protective clothing and footwear as required in EM 385-1-1, 05.A.08, high visibility orange reflective vests, warm clothing.

Inspection requirements:

Daily inspection of all listed equipment should take place prior to donning. Equipment should be inspected for integrity and completeness.

Staten Island Landfill Debris Disposal Operation**Health and Safety Program****Training requirements:**

Grapple Operators are both contractors and employees of DSNY who will be on the job site continuously. Each employer must provide documentation of training (operator certificate or certified letter). The certificate/letter must indicate that each equipment operator has been trained in the proper operation of the equipment. Operators must be trained in the use of respiratory protection. This training will most likely be provided by the employers of the operators, but an amended form of respiratory protection training will be available on-site. Operators will be offered to receive initial respiratory training, fit testing, and limited medical evaluations as part of their site orientation, if needed.

3.3 FRONT-END LOADER OPERATORS

This includes workers operating front-end loaders. This workforce includes employees from private contractors and employees of DSNY at the barge operations. These workers will be in the Exclusion Zone.

Analyzed by/Date:

Reviewed by/Date:

Principal Steps	Potential Hazard	Recommended Controls
Equipment mounting and dismounting	1) Exposure to noise in excess of 87.5dBA. 2) Slips, trips, and fall hazards. 3) Contusion from frame of cab. 4) Injury from other vehicles. 5) Exposure to asbestos and other chemical agents. 6) Exposure to heat/cold stress.	1) Use of hearing protection with an adequate noise reduction rating to be determined from exposure monitoring. 2) Use of 3 point mounting techniques and proper footwear. 3) Use of hard hat and safety belts 4) Proper equipment spacing and training. 5) Exposure assessment through monitoring, and use of respiratory protection and suits. 6) Inclusion into heat/cold stress program.
Movement of loader around debris piles, sifting equipment and discharge of load onto ground at manual pit sorting operations.	1) Exposure to noise in excess of 87.5dBA (open cab only). 2) Injury by flying debris. 3) Exposure to asbestos and other chemical agents. 4) Potential for pushed debris to reach operator from the track, blade or adjacent debris pile.	1) Use of hearing protection with an adequate noise reduction rating to be determined from exposure monitoring. 2) Use of safety glasses and hard hats. 3) Exposure assessment through monitoring and use of respiratory protection and suits. 4) Ensure operator training in the safe methods of pushing debris and being attentive when performing loading operations.

Staten Island Landfill Debris Disposal Operation**Health and Safety Program**

Equipment to be used:

Hearing protection (level to be determined based on noise exposure monitoring), ½ face negative pressure respirators with HEPA/OV filters, hard hats, eye protection, protective suits and footwear as required in EM 385-1-1, 05.A.08, high visibility orange reflective vests, warm clothing.

Inspection requirements:

Daily inspection of all listed equipment should take place prior to donning. Equipment should be inspected for integrity and completeness.

Training requirements:

Loader Operators are both contractors and employees of DSNY who will be on the job site continuously. Each employer must provide documentation of training (operator certificate or certified letter). The certificate/letter must indicate that each equipment operator has been trained in the proper operation of the equipment. Training in the use of the respirators must be provided. This training will most likely be provided by the employers of the operators, but an amended form of respiratory protection training will be available on-site. Operators will be offered to receive initial respiratory training, fit testing, and limited medical evaluations as part of their site orientation, if needed.

Staten Island Landfill Debris Disposal Operation**Health and Safety Program****3.4 DOZER OPERATORS**

This includes workers operating bulldozers. This workforce includes employees from private contractors. The workers will be in the exclusion zones.

Analyzed by/Date:

Reviewed by/Date:

Principal Steps	Potential Hazard	Recommended Controls
Equipment mounting and dismounting	1) Exposure to noise in excess of 87.5dBA. 2) Slips, trips, and fall hazards. 3) Contusion from frame of cab. 4) Injury from other vehicles. 5) Exposure to asbestos and other chemical agents. 6) Exposure to heat/cold stress.	1) Use of hearing protection with an adequate noise reduction rating to be determined from exposure monitoring. 2) Use of 3 point mounting techniques and proper footwear. 3) Use of hard hat and safety belts 4) Proper equipment spacing and training. 5) Exposure assessment through monitoring, use of respiratory protection and suites. 6) Inclusion into heat/cold stress program.
Movement of Dozer around debris piles, sifting equipment and displacement of load onto ground at manual pit sorting operations.	1) Exposure to noise in excess of 87.5dBA (open cab only) 2) Injury by flying debris 3) Exposure to asbestos and other chemical agents. 4) Potential for pushed debris to reach operator from the track, blade or adjacent debris pile.	1) Use of hearing protection with an adequate noise reduction rating to be determined from exposure monitoring. 2) Use of safety glasses and hard hats 3) Exposure assessment through monitoring, use of respiratory protection and suits. 4) Ensure operator training in the safe methods of pushing debris and being attentive when performing loading operations.

Equipment to be used:

Hearing protection (level to be determined based on noise exposure monitoring), ½ face negative pressure respirators with HEPA/OV filters, hard hats, eye protection, protective suites and footwear as required in EM 385-1-1, 05.A.08, high visibility orange reflective vests, warm clothing.

Inspection requirements:

Daily inspection of all listed equipment should take place prior to donning. Equipment should be inspected for integrity and completeness.

Staten Island Landfill Debris Disposal Operation**Health and Safety Program****Training requirements:**

Dozer Operators are contractors who will be on the job site continuously. Each employer must provide documentation of training (operator certificate or certified letter). The certificate/letter must indicate that each equipment operator has been trained in the proper operation of the equipment. Training in the use of the respirators must be provided. This training will most likely be provided by the employers of the operators, but if not, operators will be offered to receive initial respiratory training, fit testing, and limited medical evaluations as part of their site orientation, if needed.

3.5 TRUCK OPERATORS

This includes workers who operate vehicles that transport bulk debris through the site. This workforce includes employees from private contractors and employees of DSNY. These workers will be entering exclusion.

Analyzed by/Date:

Reviewed by/Date:

Principal Steps	Potential Hazard	Recommended Controls
Equipment mounting and dismounting	1) Exposure to noise in excess of 87.5dBA. 2) Slip, trips, and fall hazard hazards. 3) Contusion from frame of cab. 4) Injury from other vehicles. 5) Exposure to asbestos and other chemical agents. 6) Exposure to heat/cold stress.	1) Use of hearing protection with an adequate noise reduction rating to be determined from exposure monitoring. 2) Use of 3 point mounting techniques and proper footwear. 3) Use of hard hat and safety belts 4) Proper equipment spacing and training. 5) Exposure assessment through monitoring, use of respiratory protection and protective suits. 6) Inclusion into heat/cold stress program.
Movement of trucks along designated roads as well as around debris piles, sifting equipment. Discharge of load at designated location.	1) Exposure to noise in excess of 87.5dBA (open cab only). 2) Injury by flying debris 3) Exposure to asbestos and other chemical agents. 4) Injury to others from operational hazards of the equipment.	1) Use of hearing protection with an adequate noise reduction rating to be determined from exposure monitoring. 2) Use of safety glasses and hard hats. 3) Exposure assessment through monitoring, use of respiratory protection and protective suits. 4) Ensure people, equipment and materials are not unknowingly in the immediate radius of the discharged load.

Equipment to be used:

Hearing protection (level to be determined based on noise exposure monitoring), ½ face negative pressure respirators with HEPA/OV filters, hard hats, eye protection, protective footwear as required in EM 385-1-1, 05.A.08, high visibility orange reflective vests, warm clothing.

Inspection requirements:

Daily inspection of all listed equipment should take place prior to donning. Equipment should be inspected for integrity and completeness.

Training requirements:

Truck operators are employees of the NYDS. As such, they are subject to the requirements of the Operations and Maintenance Plan for the Fresh Kills Landfill, Revised 30, January 1999, Document No. 02147-005-003-09005-13. Requirements and protocols described in that document will complement those presented in this Plan, unless otherwise noted. Operators will be offered to receive initial respiratory training, fit testing, and limited medical evaluations as part of their site orientation, if needed.

Staten Island Landfill Debris Disposal Operation

Health and Safety Program

3.6 MECHANICAL SEPARATOR SORTERS

This includes workers sifting through debris being ejected from the various mechanical separators. This workforce includes employees from the NYPD and the FBI. These workers will be in the Exclusion Zone.

Analyzed by/Date:

Reviewed by/Date:

Principal Steps	Potential Hazards	Recommended Controls
Equipment mounting and dismounting	1) Exposure to noise in excess of 87.5dBA. 2) Slips, trips, and fall hazard. 3) Injury by flying debris. 4) Injury from other vehicles. 5) Exposure to asbestos and other airborne chemical agents. 6) Exposure to heat/cold stress.	1) Use of hearing protection with an adequate noise reduction rating to be determined from exposure monitoring. 2) Use of 3 point mounting techniques and proper footwear. 3) Use of hard hat and eye protection. 4) Proper equipment spacing and training. 5) Exposure assessment through monitoring, use of respiratory protection and protective suits. 6) Inclusion into heat/cold stress program.
Manually sift through debris	1) Exposure to noise in excess of 87.5dBA. 2) Exposure to asbestos and other airborne chemicals. 3) Being hit by moving vehicles. 4) Being hit by projectiles. 5) Heat/cold stress. 6) Repetitive motion disorders. 7) Fall hazard when working on scaffolds. 8) Entanglement with moving parts of mechanical separators.	1) Use of hearing protection with an adequate noise reduction rating to be determined from exposure monitoring. 2) Use of respiratory protection and protective suits. 3) Use of high visibility clothing and reflective vests. 4) Use of hard hats, eye protection and safety boots. 5) Inclusion into heat/cold stress program. 6) Task rotation and education. 7) Installation of handrails and toe guards as per EM 385-1-1, 21.B.01. 8) Avoidance of loose fitting protective clothing, use duct tape to secure suits. Have good understanding of operation of equipment including location of emergency cut-off devices. Institute "buddy system".

Staten Island Landfill Debris Disposal Operation**Health and Safety Program**

Equipment to be used:

Hearing protection (level to be determined based on noise exposure monitoring), ½ face negative pressure respirators with HEPA/OV filters, hard hats, eye protection, protective clothing and footwear as required in EM 385-1-1, 05.A.08, high-visibility orange reflective vests, warm clothing.

Inspection requirements:

Daily inspection of all listed equipment should take place prior to donning. Equipment should be inspected for integrity and completeness.

Training requirements:

Mechanical Separator sorters are assigned to the project on a rotational basis. Sorters will receive initial respiratory training, fit testing, and limited medical evaluations, as a part of their site orientation. Additional safety training should take place for individual pieces of mechanical sorting equipment.

Staten Island Landfill Debris Disposal Operation

Health and Safety Program

3.7 TORCH CUTTERS

This includes personnel performing torch cutting on structural steel. This workforce includes employees from private contractors.

Analyzed by/Date:

Reviewed by/Date:

Principal Steps	Potential Hazards	Recommended Controls
Accessing material to be cut	1) Exposure to noise in excess of 87.5dBA. 2) Slip, trips, and fall hazards. 3) Injury by flying debris 4) Injury from other vehicles. 5) Exposure to asbestos and other chemical agents. 6) Exposure to heat/cold stress.	1) Use of hearing protection with an adequate noise reduction rating to be determined from exposure monitoring. 2) Use of 3 point mounting techniques and proper footwear. 3) Use of hard hats and eye protection. 4) Proper equipment spacing and training. 5) Exposure assessment through monitoring, use of respiratory protection and protective suits. 6) Inclusion into heat/cold stress program.
Cutting material	1) Exposure to noise in excess of 87.5dBA. 2) Exposure to airborne asbestos. 3) Possible exposure to other airborne contaminants including fumes from the torch cutting operations. 4) Being hit by moving vehicles. 5) Being hit by projectiles. 6) Heat/cold stress. 7) Burns. 8) Foot injury from falling cut material.	1) Use of hearing protection with an adequate noise reduction rating to be determined from exposure monitoring. 2) Use of respiratory protection. 3) Assessment to other chemicals including metal fumes. 4) Use of high visibility clothing and reflective vests. 5) Use of hard hats, eye protection and safety boots. 6) Inclusion into heat/cold stress program. 7) Use of welding protective clothing. 8) Training on proper positioning of material being cut.

Equipment to be used:

Hearing protection (level to be determined based on noise exposure monitoring), ½ face negative pressure respirators with HEPA/OV filters, hard hats, eye protection/full face shield, protective footwear as required in EM 385-1-1, 05.A.08, high visibility orange reflective vests, warm clothing, welding clothing.

Staten Island Landfill Debris Disposal Operation

Health and Safety Program

Inspection requirements:

Daily inspection of all listed equipment should take place prior to donning. Equipment should be inspected for integrity and completeness.

Training requirements:

Torch Cutters receive job specific training as a part of their individual job certification. Additionally, cutters will receive site indoctrination, and will be offered respiratory protection training, fit testing, and limited medical evaluations, if needed.

3.8 SITE MANAGERS AND FIELD SUPPORT PERSONNEL

This includes site personnel who provide a variety of ancillary and oversight services in support of the operators of heavy equipment and sorters. Many of these job functions require intermittent entry into the exclusion zone. This includes employees from all agencies present at the site.

Analyzed by/Date:

Reviewed by/Date:

Principal Steps	Potential Hazards	Recommended Controls
Periodic and/or continuous inspection of the site, walking the site	1) Exposure to noise in excess of 87.5dBA. 2) Injury by flying debris and/or falling debris. 3) Slips, trips, and fall hazards 4) Injury by vehicles. 5) Exposure to asbestos and other chemical hazards.	1) Use of hearing protection with an adequate noise reduction rating to be determined from exposure monitoring. 2) Use of safety glasses, hard hats, foot protection. 3) Minimize hazards throughout site. 4) Use of reflective vests. 5) Use of respiratory protection, assessment for asbestos and other potential chemical hazards.

Equipment To be Used:

Hearing protection (level to be determined based on noise exposure monitoring), ½ face negative pressure respirators with HEPA/OV filters, hard hats, eye protection, protective footwear as required in EM 385-1-1, 05.A.08, high visibility orange reflective vests, warm clothing.

Inspection Requirements:

PPE should be inspected before donning for integrity and completeness.

Training Requirements:

Persons inspecting the exclusion zone, or inspecting activities taking place in the exclusion zone should receive a general site indoctrination as well as specific hazard control training. Individual agencies on the site may have their own training that will complement the requirements of this plan, including respiratory protection. Operators will be offered to receive initial respiratory training, fit testing, and limited medical evaluations as part of their site orientation, if needed.

Staten Island Landfill Debris Disposal Operation

Health and Safety Program

3.9 MECHANICAL CUTTERS

This includes personnel cutting vehicles towards the south side of the site. These personnel are primarily from the fire department (NYFD as well as volunteer FDs), NYPD and FBI.

Analyzed by/Date:

Reviewed by/Date:

Principal Steps	Potential Hazards	Recommended Controls
Accessing material to be cut	1) Exposure to noise in excess of 87.5dBA. 2) Slip hazard. 3) Injury by flying debris 4) Injury from other vehicles. 5) Exposure to asbestos and other chemical agents. 6) Exposure to heat/cold stress. 7) Crush hazard from unstable material. 8) Potential for confined space or potential accumulation of methane or hydrogen sulfide in enclosed spaces.	1) Use of hearing protection with an adequate noise reduction rating to be determined from exposure monitoring. 2) Use of 3 point mounting techniques and proper footwear. 3) Use of hard hats and eye protection. 4) Proper equipment spacing and training. 5) Exposure assessment through monitoring, use of respiratory protection and protective suits. 6) Inclusion into heat/cold stress program. 7) Have established procedures for accessing material stability. 8) Proceed with car, ventilate or test spaces with hydrogen sulfide/LEL meter.
Cutting material	1) Exposure to noise in excess of 87.5dBA. 2) Exposure to airborne asbestos. 3) Possible exposure to other airborne contaminants including metal dust from cutting operations. 4) Being hit by moving vehicles. 5) Being hit by projectiles. 6) Heat/cold stress. 7) Crush hazard from unstable cuts. 8) Foot injury from falling cut material. 9) Potential explosive environment due to the potential accumulation of methane	1) Use of hearing protection with an adequate noise reduction rating to be determined from exposure monitoring. 2) Use of respiratory protection. 3) Assessment to other chemicals including metal fumes. 4) Use of high visibility clothing and reflective vests. 5) Use of hard hats, eye protection and safety boots. 6) Inclusion into heat/cold stress program. 7) Prohibit cutting of material that is not at "zero mechanical state" 8) Training on proper positioning of material being cut.

Staten Island Landfill Debris Disposal Operation

Health and Safety Program

	methane.	9) Prior to cutting, verify that area is well ventilated and test cutting area with LEL.
--	----------	--

Equipment to be used:

Hearing protection (level to be determined based on noise exposure monitoring), ½ face negative pressure respirators with HEPA/OV filters, hard hats, eye protection/full face shield, protective footwear as required in EM 385-1-1, 05.A.08, high visibility orange reflective vests, warm clothing, heavy clothing suitable to offer protection against sparks, if necessary.

Inspection requirements:

Daily inspection of all listed equipment should take place prior to donning. Equipment should be inspected for integrity and completeness.

Training requirements:

Mechanical cutters will receive specialized training in the safe use of cutting equipment. Additionally, they will receive site indoctrination. Respiratory protection will likely be provided by the individual fire departments, however supplemental on-site respirator training, fit testing, and limited medical evaluations will be offered, if needed.

Staten Island Landfill Debris Disposal Operation**Health and Safety Program****3.10 INDUSTRIAL HYGIENE TECHNICIANS/SAFETY MONITORS**

This includes personnel conducting industrial hygiene activities (worker exposure monitoring and safety inspections) around the job site. Industrial hygiene technicians will be employees of contractors as well as the FBI, the Public Health and Human Resource Department, and USCG. These workers will be intermittently entering and exiting the Exclusion Zone.

Analyzed by/Date:

Reviewed by/Date:

Principal Steps	Potential Hazards	Recommended Controls
Collection of air samples	1) Exposure to noise in excess of 87.5dBA. 2) Injury by flying debris 3) Exposure to asbestos and other hazardous chemicals. 4) Injury by vehicles.	1) Use of hearing protection with an adequate noise reduction rating to be determined from exposure monitoring. 2) Use of safety glasses and hard hats. 3) Use of respiratory protection and protective suits. Monitoring of air contaminants. 4) Use of reflective vests.
Inspection of work site	1) Exposure to noise in excess of 87.5dBA. 2) Injury by flying debris 3) Exposure to asbestos and other airborne chemicals. 4) Injury by vehicles.	1) Use of hearing protection with an adequate noise reduction rating to be determined from exposure monitoring. 2) Use of safety glasses and hard hats. 3) Inclusion into respiratory protection program and protective suits. Monitoring of air contaminants. 4) Use of reflective vests.

Equipment To be Used:

Hearing protection (level to be determined based on noise exposure monitoring), ½ face negative pressure respirators with HEPA/OV filters, hard hats, eye protection, protective clothing and footwear as required in EM 385-1-1, 05.A.08, high visibility orange reflective vests, warm clothing.

Inspection Requirements:

PPE should be inspected before donning for integrity and completeness.

Training Requirements:

Persons inspecting the exclusion zone, or inspecting activities taking place in the exclusion zone will receive a general site indoctrination as well as specific hazard control training. Individual agencies on the site may have their own training that will complement the requirements of this Plan. Initial respiratory training, fit testing, and limited medical evaluations will be offered to those who need it.

SECTION 4 - HAZARD CONTROL PROGRAM

4.1 GENERAL HAZARDS AT MUNICIPAL SOLID WASTE LANDFILLS

The Staten Island landfill complex is one of the largest landfills in the United States. The portion of the Staten Island landfill complex where the debris sorting activities are being conducted is a municipal solid waste (MSW) landfill that was recently closed. An MSW landfill receives predominantly household waste.

There are numerous chemical, physical and biological hazards associated with an MSW landfill. The rough terrain could result in numerous physical hazards such as vehicle accidents, slipping, tripping, and falling. Driving vehicles on uneven surfaces creates a potential for possible vehicle roll-overs, hitting rocks and debris, getting stuck in mud or ditches, etc. The steep slopes of the landfill with loose vegetative cover represent possible tripping, falling, and slipping hazards. Heavy truck and equipment traffic, gravel slung by vehicle tires, and debris falling from trucks represent possible projectile hazards to pedestrian workers.

Landfill gas is a potential chemical hazard of concern at MSW facilities. Methane and carbon dioxide are the primary constituents of landfill gas. Landfill gas also contains trace amounts of numerous hazardous air pollutants. A discussion of the specific chemical hazards that may represent the most significant potential exposure concern at the Staten Island landfill are further discussed in Section 4.3, Chemical Hazards.

The area of the landfill where debris sorting is being conducted contains an active landfill gas extraction system. This system should minimize the non-point source emissions of landfill gasses from the landfill. It is possible that the general construction activities and the additional weight associated with the project-related equipment and management structures could cause an increase in landfill gas emissions. The well heads for the landfill gas collection system represent a potential safety hazard if the well heads were damaged, as there could be an immediate potential explosive hazard.

4.2 PHYSICAL HAZARDS

The two biggest hazards on this site include getting hit or run-over by equipment/trucks and flying or rapidly shifting pieces of debris. Special care should be used when working in the proximity to these concerns.

4.2.1 Noise

Noise associated with the operation of heavy equipment is a potential physical hazard. Exposure to excessive noise levels for prolonged periods of time may result in hearing loss and threshold shifts in hearing sensitivity. Their employers will require some workers,, to wear approved hearing protection when working in or around the work site. Workers operating equipment fitted with a cab designed to reduce sound levels may not be required to wear hearing protection, while in the cab.

Periodic noise evaluations at various locations around work area will be performed. If areas are found to have sound levels in excess of 82.5 decibal weighted in the "A" scale (dBA), noise dosimetry monitoring based on a 12-hour time-weighted average (TWA) will be performed on workers. If the level of noise exceeds the current OSHA Permissible Noise Exposure standard (adjusted for a 12 hour work shift) of 87.5 dBA, personnel will be required to wear approved hearing protection. While the OSHA standard calls for personnel who are exposed to elevated noise to be enrolled in a hearing conservation program, this may not be technically feasible due to the number of transient site workers on this project. While this Plan describes minimally acceptable standards for the work, individual agencies and contractors working on the site are encouraged to follow the OSHA standard.

4.2.2 Fire

Based on the existing site conditions, fire watches will not be conducted at this time. However, in the event of a land fill gas extraction wellhead breach, the potential for fire and/or explosion is increased and the NYFD and DSNY should be contacted immediately. The local fire department

Staten Island Landfill Debris Disposal Operation

Health and Safety Program

number will be posted at the job site for use in the event of an emergency. No smoking is permitted within 50 feet radius of gas extraction wellheads.

4.2.3 Illumination

Illumination levels for various work processes have been specified in EM 358-1-1, Section 07.A.01 and are shown below:

Means of egress--

Means of egress shall be illuminated, with emergency and non-emergency lighting, to provide a minimum of 11 lux (lx) (1 footcandle (lm/ft)), measured at the floor. Additionally, illumination shall be arranged so that the failure of any single lighting unit, including the burning out of an electric bulb, will not leave any area in total darkness.

MINIMUM LIGHTING REQUIREMENTS

Facility or function	Illuminance - lx (lm/ft) 2
Accessways	
- General indoor	55 (5)
- General outdoor	33 (3)
- exitways, walkways, ladders, stairs	110 (10)
Administrative areas (offices, drafting and meeting rooms, etc.)	540 (50)
Chemical laboratories	540 (50)
Construction areas	
- General indoor	55 (5)
- General outdoor	33 (3)
- Tunnels and general underground	55 (5)
Work areas (minimum 110 lux required at tunnel and shaft heading during drilling, mucking, and scaling)	
Conveyor routes	110 (10)
Docks and loading platforms	33 (3)
Elevators, freight and passenger	215 (20)
First aid stations and infirmaries	325 (30)
Maintenance/operating areas/shops	

Staten Island Landfill Debris Disposal Operation**Health and Safety Program**

Facility or function	Illuminance - lx (lm/ft) 2
- Vehicle maintenance shop	325 (30)
- Carpentry shop	110 (10)
- Outdoor field maintenance area	55 (5)
- Refueling area, outdoors	55 (5)
- Shops, fine detail work	540 (50)
- Shops, medium detail work	325 (30)
- Welding shops	325 (30)
Mechanical/electrical equipment rooms	110 (10)
Parking areas	33 (3)
Toilets, wash, and dressing rooms	110 (10)
Visitor areas	215 (20)
Warehouses and storage rooms/areas	
- Indoor stockroom, active/bulk storage	110 (10)
- Indoor stockroom, inactive	55 (5)
- Indoor rack storage	270 (25)
- Outdoor storage	33 (3)
Work areas - general (not listed above)	325 (30)

4.2.4 Site Vehicle Safety

A site specific traffic plan will be developed following the establishment of the work site. The traffic plan will be issued as an addendum to this document. The purpose of the traffic plan is to provide onsite personnel and contractors entering the site with an idea of the traffic flow to optimize movement of vehicular traffic. Safe driving practices should be followed and seat belts worn, when available. Special consideration should be given to the amount of pedestrian traffic and therefore driving speeds should be kept to a minimum. Vehicles if driven after dark, shall be equipped with lights. In the event of fog, vehicles should be driven with their lights on.

4.2.5 Heat/Cold Stress**Heat Stress--**

The purpose of this section is to describe monitoring and control measures to minimize the potential for adverse health effect due to heat stress. This section applies to work being perform outdoors

Staten Island Landfill Debris Disposal Operation**Health and Safety Program**

when ambient weather exceeds 75 degrees Fahrenheit measured as a Wet Bulb Globe Temperature (WBGT) as defined by the American Conference of Governmental Industrial Hygienists (ACGIH). Heat stress will be evaluated based on three factors accordingly:

- WBGT base index determined by environmental data.
- Correction of WBGT base index for use of personal protective equipment.
- Correction of WBGT base for variations of work loads.

The resulting WBGT index will be used to calculate a Threshold Limit Value (TLV) as described by the ACGIH, for heat stress. Exceeding the TLV is prohibited, and could result in serious injury or death to workers. When applicable, the WBGT will be monitored by industrial hygiene technicians during both day and night shifts. Data will be evaluated by a Certified Industrial Hygienist (CIH), who will determine the TLV based on the factors listed in this section. EE&G's CIH is available to assist with Heat Stress Monitoring.

Workers should be instructed to periodically monitor their heart rate during periods of high ambient temperatures, or periods involving heavy work. A maximum, sustained heart rate of 100 beats per minute should result in the temporary removal of a worker from the exclusion zone.

The primary method of minimizing the adverse effects of heat stress will be through the implementation of a work/rest regiment, expressed as a percentage of time out of each hour that a worker can perform their respective task. The unadjusted TLV for heat stress is presented below. Designated rest areas should be outside of the exclusion zone (no PPE requirements), and should be in an air-conditioned environment. Temperatures are shown as degrees Fahrenheit (°F):

Work/rest regiment	Workload		
	Light	Moderate	Heavy
Continuous Work	86	80	77
75% work/25% rest	87	82	78
50% work/50% rest	89	85	82
25% work/75% rest	90	88	86

Examples of adjustments to these values will be made for personal protective equipment and clothing as follows:

- Summer work uniform – correction of 0 °F.
- Cotton overalls – correction of – 2 °F.
- Winter work uniform – correction of – 4 °F.
- Water barrier, permeable – correction of – 6 °F.

The CIH may calculate TLVs based on collected data according to formulas described. Other control measures, and factors to consider in conjunction with the establishment of a TLV include:

Hydration – Water and electrolyte replenishing beverages will be readily available, and workers will be encouraged to consume these beverages regularly. The intake of fluids should equal the rate of water loss.

Food consumption – The workers should be encouraged to salt their food well during the hot season and particularly during periods of hot weather. Individuals with restricted diets should consult their physicians prior to alteration of their diets.

Acclimatization – Workers who do not regularly perform physical activities in an outdoor setting may require a further adjustment to the TLVs.

Cold Stress--

Four factors contribute to cold stress: cold temperatures, high or cold wind, dampness and cold water. A cold environment forces the body to work harder to maintain its temperature. Cold air, water, and snow all draw heat from the body. Wind chill is the combination of air temperature and wind speed. For example, when the air temperature is 40° F, and the wind speed is 35 mph, your exposed skin receives conditions equivalent to the air temperature being 11° F. So, while it is obvious that below freezing conditions combined with inadequate clothing could bring about cold stress, it is important to understand that it can also be brought about by temperatures in the 50's coupled with rain and wind.

When in a cold environment, most of your body's energy is used to keep your internal temperature warm. Over time, your body will begin to shift blood flow from your extremities (hands, feet, arms, and legs) and outer skin to the core (chest and abdomen). This allows exposed skin and the extremities to cool rapidly and increases the risk of frostbite and hypothermia. Combine this with cold water, and trench foot may also be a problem.

Hypothermia

Hypothermia is an abnormal and dangerous condition in which the temperature of the body is below 95 degrees Fahrenheit (35 degrees Centigrade). Hypothermia is usually caused by prolonged exposure to cold. When more heat is lost than the body can generate, hypothermia can result. Common causes include:

- Falling overboard from a boat into cold water
- Being outside with an uncovered head in winter
- Wearing wet clothing for a prolonged period of time in windy weather, heavy exertion, or poor fluid or food intake. This can also cause hypothermia even in above-freezing temperatures.

The onset of symptoms is usually slow; there is likely to be a gradual loss of mental acuity and physical ability. The person experiencing hypothermia, in fact, may be unaware that he or she is in a state that requires emergency medical treatment. Symptoms include:

- Apathy or lethargy.
 - Confusion.
 - Drowsiness.
 - Loss of coordination.
 - Pale and cold skin.
 - Shock
 - Slowing of breathing.
 - Slurred speech.
-

- Uncontrollable shivering.
- Weakness.

The people most likely to experience hypothermia are those who are very old, very young, or very lean; those who have heart or circulation problems; and people who are hungry, tired, or under the influence of alcohol or other drugs. Hypothermia is one of the body's remarkable responses to cold and can actually protect the brain and heart.

If the victim has both hypothermia and frostbite, give first aid for the hypothermia first.

- 1) If the victim is conscious and you suspect hypothermia, get the victim out of the cold and seek onsite medical attention. Handle the victim gently. People with hypothermia are at risk for cardiac arrest.
- 2) If going indoors is not possible, get the victim out of the wind, cover their head, and insulate them from the cold ground. If at all possible, get the victim inside to an area at room temperature and cover them with warm blankets.
- 3) Once inside, take off any wet or constricting clothes and replace them with dry clothing.
- 4) Warm the victim. Cover the head and neck. Apply warm compresses to the neck, chest wall, and groin. If the victim is alert and can easily swallow, give warm, sweetened fluids (nonalcoholic) to aid in the warming process.
- 5) Stay with the victim until medical help arrives.

DO NOT use your own comfort to decide if an area is warm enough, since people respond differently to cold.

DO NOT attempt to warm a severely hypothermic person without medical advice.

DO NOT use direct heat (such as hot water, a heating pad, or a heat lamp) to warm the victim.

DO NOT give the victim alcohol!

Immediately Seek or Contact Onsite Emergency Medical Assistance

Knowing that frostbite and hypothermia are closely related is important to helping to mitigate factors that can contribute to frostbite. These factors include extreme cold; wet clothes; high winds ("wind chill"); and poor circulation, which can be caused by tight clothing or boots, cramped positions, fatigue, certain medication, smoking, alcohol use, or diseases that affect the blood vessels, such as diabetes, poor fluid intake (fluid imbalance), and inadequate food. Wear suitable clothing in cold temperatures and protect susceptible areas. In cold weather, wear mittens (not gloves); wind-proof, water-resistant, many-layered clothing; two pairs of socks (cotton next to skin, then wool); and a scarf and a hat that cover the ears (to avoid substantial heat loss through the scalp). Before anticipated prolonged exposure to cold, don't drink alcohol or smoke (both interfere with blood circulation), and get adequate food and rest. If caught in a severe snowstorm, find shelter early.

Frostbite

Frostbite is damage to the skin and underlying tissues caused by extreme cold. Frostbite occurs when the skin and body tissues are exposed to cold temperature for a prolonged period of time. Hands, feet, nose and ears are most likely to be affected. Although anyone who is exposed to freezing cold for a prolonged period of time can get frostbite, people who are taking beta-blockers, which decrease the flow of blood to the skin, are particularly susceptible. So are people with atherosclerosis (a disorder of the arteries). Other things that increase the risk of frostbite include smoking, windy weather (which increases the chill factor), diabetes mellitus, and peripheral neuropathy or Raynaud's phenomenon.

The first symptoms are a "pins and needles" sensation followed by numbness. Frostbitten skin is hard, pale, cold, and has no feeling. When skin has thawed out, it becomes red and painful (early frostbite). With more severe frostbite, the skin may appear white and numb (tissue has started to freeze). Very severe frostbite may cause blister; gangrene (blackened tissue that died after blood vessels froze); or hard, frozen skin (frostbite can penetrate all the way down to blood vessels and bone).

A person with frostbite on the extremities may also be subject to hypothermia (lowered body temperature). Check for hypothermia and treat those symptoms first. Frostbite is distinguishable by the hard, pale, and cold quality of the skin that has been exposed to the cold for a length of time. The area is likely to lack sensitivity to touch, although there is probably a sharp, aching pain. As the area thaws, the flesh becomes red and painful. Any part of the body may be affected by frostbite; but hands, feet, nose and ears are the most vulnerable. If only the skin and underlying tissues are damaged, recovery may be complete. However, if blood vessels are affected, the damage is permanent and gangrene can follow which may necessitate amputation of the affected part. Upon warming, it is common to experience pain and tingling or burning in the affected area. In addition, blisters (in severe cases), shivering, slurred speech, and some memory loss may occur.

Typical first aid includes:

- 1) Shelter the victim from the cold and move the victim to a warmer place. Remove any constricting jewelry and wet clothing.
- 2) Immerse affected areas in warm (NOT HOT) water--or apply warm cloths to affected ears, nose, or cheeks--for 20 to 30 minutes. Keep circulating the water to aid the warming process. Burning pain, swelling and color changes may occur during warming. Warming is complete when the skin is soft and sensation returns.
- 3) Apply dry, sterile dressing to the frostbitten areas. Put dressings between frostbitten fingers or toes.
- 4) Move thawed areas as little as possible.
- 5) Prevent refreezing by wrapping the warmed areas.
- 6) If the frostbite is extensive, give warm drinks to the victim in order to replace lost fluids.

Staten Island Landfill Debris Disposal Operation**Health and Safety Program**

DO NOT thaw out a frostbitten area if it cannot be kept thawed. Refreezing may make tissue damage even worse.

DO NOT use direct heat (such as a radiator, campfire, heating pad, or hair dryer applied directly to the frostbitten area). Direct heat can burn the tissues that are already damaged.

DO NOT rub or massage the affected area.

DO NOT disturb blisters on frostbitten skin.

DO NOT smoke or drink alcoholic beverages during recovery as both interfere with blood circulation.

Immediately Seek or Contact Onsite Emergency Medical Assistance

By being aware of the factors that can contribute to frostbite, potential exposure can be minimized. These include extreme cold; wet clothes; high winds; and poor circulation, which can be caused by tight clothing or boots, cramped positions, fatigue, certain medication, smoking, alcohol use, or diseases that affect the blood vessels, such as diabetes. Wear suitable clothing in cold temperatures and protect susceptible areas. In cold weather, wear mittens (not gloves); wind-proof, water-resistant, many-layered clothing; two pairs of socks (cotton next to skin, then wool); and a scarf and a hat that cover the ears (to avoid substantial heat loss through the scalp). Before anticipated prolonged exposure to cold, don't drink alcohol or smoke, and get adequate food and rest. If caught in a severe snowstorm, find shelter early or increase physical activity to maintain body warmth.

Trench Foot

Trench foot is a condition of the feet resembling frostbite due to the prolonged action of water on the skin combined with circulatory disturbance due to cold and inaction. Seek onsite medical assistance. Keeping feet dry and warm by wearing waterproof boots and dry socks will likely minimize conditions that may contribute to trench foot.

Fatigue

Due to the demanding nature and long hours associated with this operation, worker fatigue should be assessed regularly by agencies/contractors to minimize potential for injury. Fatigue is defined as a feeling of lack of energy, weariness or tiredness. Possible causes of fatigue include:

- Chronic boredom.
- Chronic infection/sickness.
- Drugs such as antihistamines, antihypertensives, sedative, or diuretics.
- Excessive physical exertion.
- Poor nutrition.
- Anxiety and depression.
- Grief
- Stress (prolonged or severe).
- Other medical conditions.

There are no direct cures for the most common fatigue problems. Taking a vacation, changing jobs or tasks, undertaking new activities or dealing with home-related issues may help. A balanced diet, a program of regular exercise (within prescribed limits), and adequate rest are generally recommended. Alleviating pain, which may interfere with rest, and nausea (if present), can often reduce chronic fatigue. Taking medication may make the condition worse when the drugs are discontinued.

The purpose of this section is to describe monitoring and control measures to prevent adverse health effect due to cold stress. This section applies to work being performed outdoors when ambient weather falls below 45 degrees Fahrenheit.

Cold stress will be evaluated based on a standard wind chill table, as described in the US Army Corps of Engineers (USACE) Safety and Health Requirements (EM 385-1-1), Section 06.J.

When ambient temperatures fall below 45 °F, the environmental monitoring of temperature will be performed twice each shift. When ambient temperatures fall below 30 °F, environmental monitoring of temperatures will be performed every 4 hours. Air speed will be recorded at the same frequencies as temperatures. The data will be used to evaluate risks based on the wind chill table referenced above. Temperature readings and subsequent evaluations of data will be collected from different work environments around the job site. These will include, by may not be limited to:

- Outside, unprotected work areas.
- Sheltered locations that are not heated.
- Sheltered areas that are heated.

The primary methods of controlling the adverse effects of cold stress are listed below.

Clothing – The use of clothing, especially head, foot, and nose, hand coverings will typically provide adequate protection in most anticipated cold stress situations.

Work/Warm up regimen –Workers should be instructed to seek warm shelter if they start to experience shivers, or numbness in their extremities.

Hydration – Warm, non-caffeine, drinks should be readily available. Workers should be encouraged to consume warm liquids throughout their work shift.

4.2.6 Lockout/Tagout Program

Maintenance activities involving fixed and mobile equipment will be done with the equipment tagged and locked out. The following conditions should be met:

- Controls that are to be deactivated during the course of work on energized or de-energized equipment or circuits shall be tagged.
- Equipment or circuits that are de-energized shall be rendered inoperative and shall have tags attached at all points where such equipment or circuits can be energized.
- Tags shall be placed to identify plainly the equipment or circuits being worked on.

4.2.7 Conveyors

The following conveyor information was gathered from EM 385-1-1 and will be incorporated into this project.

General--

Conveyor systems shall be constructed and installed in accordance with the manufacturer's recommendations.

Inspection, Maintenance, and Repair--

Qualified personnel shall perform inspection, maintenance, and repairs in accordance with the manufacturer's recommendations. No maintenance shall be performed when a conveyor is in operation except for the following:

- If lubrication is to be done while the conveyor is in motion, lubrication points shall be easily accessible and safe for lubrication: only trained personnel who are aware of the hazards of the conveyor in motion shall be allowed to lubricate a conveyor that is operating.
- When adjustments or maintenance is required while the conveyor is in operation, only trained personnel who are aware of the hazards shall be permitted to make the adjustment or maintenance.
- Lockout and tagout procedures shall be used.
- Safe access shall be provided to permit inspection, lubrication, repair, and maintenance activities.

Safety devices--

On all conveyors where reversing or runaway are potential hazards or the effects of gravity create a potential for hazardous uncontrolled lowering, anti-runaway devices, brakes, backstops, or other safeguards shall be installed to protect persons from injury and property from damage.

Conveyor systems shall be equipped with an audible warning signal to be sounded immediately before starting of the conveyor.

Staten Island Landfill Debris Disposal OperationHealth and Safety Program

All conveyors shall be equipped with emergency stopping devices along their full length.

Safety devices shall be arranged to operate in such a manner that if power failure or a failure of the device occurs a hazardous condition would not result.

All exposed moving machinery parts that present a hazard shall be mechanically or electrically guarded or guarded by location.

- Take-up mechanisms may be guarded as an entity by placing standard railings or fencing, and warning signs, around the area in lieu of guarding each of nip and shear point.
- Guards shall be provided at points where personnel could contact cables, chains, belts, and runaways of exposed bucket conveyors.
- Unless guarded by location, those sections of chain conveyors, which cannot be enclosed without impairing the function, shall be provided with warning signs or personnel barriers.
- At all points along the conveyor, except at points where loads are removed from or placed on a conveyor or where a conveyor discharges to or receives material from another conveyor, provisions shall be made to eliminate the possibility of loads or material being dislodged from the conveyor.

Access--

Whenever conveyors pass adjacent to, or over, work areas, protective guards shall be installed. The guards shall be designed to catch and hold any load or material that may fall off or become dislodged from the system.

Where conveyors are operated in tunnels, pits, and similar enclosures, ample room shall be provided to allow safe accessway and operating space for all personnel.

Emergency Stop Devices--

Unless the design, construction, and operation of a conveyor is clearly non-hazardous to personnel, emergency stop buttons, pull cords, limit switches, or similar emergency devices shall be provided at the following locations for remotely or automatically controlled conveyors or conveyors where operator stations are not manned or are beyond voice and visual contact from drive areas:

- Loading arms.
- Transfer points.
- Other potentially hazardous locations on the conveyor path not guarded by location or guards.

All emergency stop devices shall be easily identifiable and readily accessible. Emergency stop devices shall act directly on the control of the conveyor concerned and shall not depend on the stopping of any other equipment. Emergency stop devices shall be installed so that they cannot be overridden from other locations.

Conveyor controls shall be arranged so that in case of an emergency stop, manual reset or restart is required at the location where the emergency stop was initiated to resume conveyor operations. Control stations shall be arranged and located so that the operation of the equipment is visible from them. Controls shall be clearly marked or labeled to indicate the function controlled.

Portable Conveyors--

The raising and lowering mechanism for the boom of a portable conveyor shall be provided with a safety device, which will hold boom at any rated angle of inclination.

Portable conveyors shall be stable so that the conveyor will not topple when used with the manufacturer's rating and in a manner in which it was intended or when being moved.

Operation--

Conveyor equipment shall be used to convey only those materials for which it was designed and within the rated capacities and speeds.

Flight and apron conveyors shall be "jogged" or hand run through at least one complete revolution at installation to check design clearances prior to running under automatic power.

A conveyor that could cause injury when started shall not be started until all personnel in the area are alerted by a signal or by a designated person that the conveyor is about to start.

When a conveyor that could cause injury when started is automatically controlled or must be controlled from a remote location, an audible warning device shall be provided. The device shall be clearly audible at all points along the conveyor where personnel may be present. The warning device shall be activated by the controller device that starts the conveyor and shall continue for a period of time before the conveyor starts; a flashing light or similar visual warning shall be used with the audible device when conditions limit the effectiveness of the audible device.

Before restarting a conveyor that has been stopped because of an emergency, an inspection of the conveyor shall be conducted and the cause of the emergency stop determined.

Only trained personnel shall be permitted to operate a conveyor: training shall include instruction in operation under normal conditions and in emergencies.

The area around loading and unloading points shall be kept clear of obstructions that could create a hazard.

Riding on conveyors is prohibited.

Personnel working with or near a conveyor shall be:

Staten Island Landfill Debris Disposal Operation**Health and Safety Program**

- Instructed as to the location and operation of pertinent stopping devices, and alerted of the potential hazard of entanglement in conveyors caused by such items as loose clothing and jewelry and long hair.
- Only trained personnel shall track a conveyor belt, which must be done while the conveyor is operating.
- Applying a belt dressing or other foreign material to a rotating drive pulley or conveyor belt shall be avoided.
- Flight and apron conveyors handling sticky materials, which tend to build up shall be cleaned as often as required for safe operation.

4.2.8 Other Physical Hazards

In addition to the above-described physical hazards, other potential physical hazards associated with the transfer and handling of debris include the following:

- Working in proximity to wheel and track-equipment.
- Potentially unstable debris piles.
- Eye hazards.
- Falling or flying debris.
- Foot and ankle hazards.
- Working adjacent to vibratory shakers.
- Sharp pieces of steel, glass, and debris.
- Loose vegetation on steep landfill slopes

The potential impact of these hazards will be evaluated and appropriate control measures implemented on an as-needed basis.

4.2.9 Gas Extraction Well Heads

Gas extraction well heads extend above grade approximately 4 feet. The recovery well heads are present throughout the exclusion zone, non-regulated areas, and other parts of the site and poses a significant hazard to the safety of the site workers, if the casings are breached. Vehicular traffic should stay clear of the well heads. Well heads in areas of active site management and operation shall have the following protection:

- Preformed concrete barriers, bollards, or other physical barriers should be installed in such a fashion that if the barriers are impacted and knocked over, they will not strike the well head.
- High visibility flags should be extended above the well head to a height that will be able to be seen by mechanical equipment operators. Flags will be mounted to poles.
- Blinking lights should be included on the flagpoles at night for additional visibility.

4.2.10 Grounding and Lightning

Grounding of electrical equipment, generators, and onsite structures shall be grounded in accordance with Section 11 of EM 385-1-1. All installations shall comply with applicable National Electrical Safety Code (NESC), National Electrical Code (NEC), and United States Coast Guard regulations. Onsite structures need to be grounded in the event of lightning strikes and static discharges. The following general guidelines are provided in addition to EM 385-1-1:

Sprung Structures--

The Sprung Structures would normally be grounded by means of the two rods at each column base that are driven 5 feet into the ground. If the Jersey barriers are used it would be recommended that one rod at each column base be driven into the ground and welded to the column base.

Portable Office Trailers--

These structures should be anchored to the ground by means of a hurricane anchor fastened to the frame of the trailer. This serves a dual purpose of overturning protection from wind and grounding.

Portable Equipment--

Equipment that is not on rubber wheels should be grounded to protect the equipment operator and the equipment.

Electrical Systems--

Electrical systems providing power to buildings and trailers should be properly grounded in accordance with NEC Standards.

4.3.11 Confined Spaces

A Confined space is a space that:

- Is large enough and so configured that an employee can bodily enter and perform assigned work; and
- Has limited or restricted means for entry or exit (for example, tanks, vessels, silos, storage bins, hoppers, vaults, and pits are spaces that may have limited means of entry.); and
- Is not designed for continuous employee occupancy.

The potential presence of methane and hydrogen sulfide as components of landfill gas, and the presence of structures, which have no floor, creates a potential for these two gases to accumulate in these open-bottom structures. Additionally, there are other trailer-type facilities established onsite. However, these conditions/spaces do not meet the formal definition described above definition from 29 CFR 1910.146. Furthermore, it is not likely that the normal sorting/sifting operation creates conditions for permit-required confined spaces. It should be recognized that these gases could

accumulate in the structures and therefore creates a need for continuous monitoring. Continuous LEL/Hydrogen Sulfide monitors will be installed in all operational structures on the top of the landfill. Additionally, onsite workers should be aware that hydrogen sulfide, methane/carbon dioxide (landfill gas mixture) could accumulate in low-lying areas of the landfill. Care should be taken when working in low lying areas and monitoring should be conducted especially when air circulation is minimal.

4.3 CHEMICAL HAZARDS

4.3.1 Asbestos

Asbestos has been detected in both bulk dust samples and air samples at Ground Zero. As of October 3, 2001, the USEPA and OSHA collected 177 bulk dust and debris samples and had them analyzed for asbestos content, and 48 samples contained over 1 percent asbestos by visual estimation. As a result, the potential of exposure to workers exposed to particulate debris may be a potential concern. Unfortunately, the non-homogeneous characteristics of the waste stream will make it very difficult to conduct a negative exposure assessment since the composition of the waste stream may change daily, depending on the characteristics of the materials.

Although the City and the State of New York maintain asbestos management programs for the proper identification, removal, disposal, and air monitoring of asbestos projects by licensed firms and individuals, it is clear that the elements surrounding this disaster will not provide for traditional management techniques. The standards were designated to address the identification and removal of "in-place" asbestos containing materials (ACM). The primary concern of this plan is to assess exposure of workers to potential asbestos-containing debris. PPE and engineering controls will be used to minimize potential worker exposure and personnel air monitoring should be conducted to assess PPE effectiveness.

4.3.2 Silica Dust and Particulate Matter Not Otherwise Specified

Silica dust created by the pulverization of construction material presents a potential inhalation hazard to workers involved in the transfer and handling of debris.

Particulate mater not otherwise specified (NOS) includes non-silica containing dust, as well as general airborne particles. The primary source of this material will be from debris being handled as a part of the project process. Furthermore, the ambient environment may contribute to potential worker exposure to this agent.

4.3.3 Landfill Chemical Agents

The following section (shown in *Italics*) was taken directly from the January 30, 1999, Operations and Maintenance Plan, Fresh Kills Landfill, Volume D, Health and Safety Plan prepared by Roy F. Weston of New York, Inc.:

A variety of gases are generated by the decomposition of waste in a landfill. The specific compounds are determined by the types of material at the landfill and the soil or treatment conditions, etc. During routine operations, the greatest potential exposure for workers is to gases and those compounds that volatilize and become airborne.

Gases and vapors that may be encountered at a landfill include the following:

Methane – *a colorless, odorless, flammable gas that in high enough concentrations acts as a simple asphyxiant (i.e. displaces oxygen). Combustible gas indicators, which are also sensitive to methane, are located in many NYCDOS structures to monitor this potentially life-threatening gas.*

Hydrogen Sulfide – *A colorless, flammable gas with a characteristic rotten egg odor. This odor, however, is only noticeable at low concentrations. Prolonged exposure can cause olfactory fatigue, thereby creating a false sense of security because the gas can no longer be detected by smell.*

Staten Island Landfill Debris Disposal OperationHealth and Safety Program

Exposure may occur when workers enter confined spaces. Hydrogen sulfide is heavier than air and tends to accumulate at the ground level. Accidental exposure may occur when workers enter confined spaces in which hydrogen sulfide is formed by decomposition. To address this hazard, testing of confined space atmospheres prior to entry will be performed by a qualified person.

Carbon Dioxide - *A colorless, odorless, non-combustible gas. Carbon dioxide is a simple asphyxiant that can cause unconsciousness and death from oxygen deficiency. Inhalation of carbon dioxide affects the rate of breathing and blood oxygen content.*

Benzene – *A colorless to light-yellow liquid with an aromatic odor. Both liquid and vapor are highly flammable. Benzene is poisonous when inhaled or absorbed through the skin. The effects of exposure include dizziness, nausea, headache, and irritated eyes, nose, and respiratory system. Benzene is considered a human carcinogen, and exposure must be kept as low as possible.*

Vinyl Chloride – *A colorless, extremely flammable gas or liquid with a pleasant odor at high concentrations. Acute system effects include central nervous system depression, causing symptoms resembling alcohol intoxication. It may also cause light-headedness and nausea. Vinyl chloride is heavier than air and tends to accumulate at ground level. Vinyl chloride is considered a human carcinogen, and exposure must be kept as low as possible.*

It is important to recognize that landfill emissions contain a variety of volatile organic compounds. While some of these compounds are present only in trace amounts, their toxicity require that they be recognized and evaluated. The potential for exposure is particularly important when specific operations are performed that increase the exposure potential, either by bringing personnel into contact with the liquids or by placing workers at locations where gases or vapors have collected.

-End of excerpt from 1999 Operations and Maintenance Plan -

EE&G obtained the 1996 document titled “*Health Consultation, Fresh Kills Landfill, Staten Island, Richmond County, New York*” prepared by the Agency for Toxic Substances and Disease Registry (ATSDR). This study was performed primarily to assess exposure issues for facilities located adjacent and downwind from the landfill, not for workers on the landfill. The “Conclusions” section of

this document indicated that *“several aldehydes were detected in the NYSDEC monitoring program at levels above health standards. Levels above health comparison values were detected in a majority of the samples collected for formaldehyde, acetaldehyde, acrolein, and propionaldehyde”*.

Based on the above, Initial worker exposure evaluations will be conducted for the following landfill gas constituents:

- Methane.
- Hydrogen sulfide.
- Aldehydes.
- Benzene and other volatile aromatic hydrocarbons.
- Vinyl chloride and other volatile organic halocarbons.
- Other constituents as deemed necessary based on information obtained regarding the composition of the Staten Island landfill gas entering the gas treatment system.

4.3.4 Other Chemical Agents

It is possible that other chemical agents may be present in the debris being brought to the site for handling and processing; however their presence is not anticipated to be significant in the overall WTC waste stream. However, limited exposure assessments may be performed on select constituents, particularly those that are detected at “Ground Zero”.

Metals can be present as unique particles originating from painted material as well as metal-containing material. The transfer and handling of the debris may result in the generation of airborne metal dust, some of which may be respirable. Due to the non-homogenous nature of the debris, the risk of metal exposure will constantly fluctuate, and therefore, a monitoring program should be developed and enacted for the duration of the project.

Numerous organic compounds may be found in the debris as a result of the fires, both before and after the WTC building collapses. While this class of chemicals does not readily form gasses, they can become airborne through the physical handling process of contaminated materials.

Furthermore, they can become attached to airborne particles (dust), which can then result in an inhalation exposure.

The risk presented by other chemical agents, at this time, is believed to be minimal. However, since the debris is non-homogeneous, monitoring for worker exposure should be conducted throughout the project duration to obtain statistically significant documentation that these potential risks are insignificant.

4.4 BIOLOGICAL HAZARDS

The presence of biological remains does not present a significant potential hazard with respect to pathogenic agents. The potential hazard from pathogenic organisms will decrease over time, as agents are exposed to ambient conditions and commingled with the debris piles. This section describes potential biological hazards associated with the planned sorting activities, where operators and ground workers may come in contact with biological remains. The following biological hazards may exist on the project site:

- Opportunistic biological agents associated with bacteria and fungi that will amplify in the wet conditions on the job site. High cellulose and nitrogen containing debris will serve as a nutrient source for various environmental bacteria and fungi. Exposure to these may cause mild to severe allergic reaction in susceptible workers. In rare and unique situations, exposure to these agents could result in disease.
- Blood-borne pathogens and vermin.

4.4.1 Route of Exposure

The primary route of exposure to biohazards is dermal injection through infections from cuts with an object contaminated with blood, body fluids, tissue, or from contact with vermin. Other routes of infection from contaminated objects are through the eyes, nose, or mouth or areas of broken skin or by ingestion, which may be facilitated by hand-to-mouth contact. Based on the potential routes of exposure, the focus of worker protection will be to promote the use of Universal Precautions, which

includes PPE and personal hygiene. Since exposure standards for biological agents do not exist, and because there are a large number of variables effecting the presence and propagation of biological agents in the remains, air, and/or water samples to confirm the presence of infectious agents will not be collected on a routine basis. Should the need arise under specific circumstances, A sampling protocol can be developed to assess worker exposure as well as the presence of infectious agents in debris, air, water or soil.

4.5 OTHER SITE HAZARDS

4.5.1 Helicopter Landing Area

The National Guard is managing the helicopter landing area. This agency will retain operational safety. General safety items for site workers not directly involved with the helicopter landing area include unauthorized personnel should maintain a distance of at least 100 meters from the landing area.

4.5.2 Barge Operations

The transfer of material from barges to trucks is being conducted according to established procedures that are covered under the Operations and Maintenance Plan Fresh Kills Landfill, Volume D, Health and Safety Plan. Because of this, this Health and Safety Plan covering the WTC-related operations will not discuss procedures involved with the transfer of material. Two notable deviations that warrant actions include:

- Potential Airborne contaminants related to the material. Exposure to potential airborne hazards will be assessed in a manner similar to work taking place at the sorting operations.
- The large volume of rebar present in the material being transferred may pose a hazard that would otherwise not be present. The observed work practice of not having employees in the general vicinity of the transfer operations should provide an adequate level of protection for the potential hazard presented by the rebar.

4.6 PERSONAL PROTECTIVE EQUIPMENT (PPE)

This section will describe the general requirements of the EPA designated levels of protection (A-D) and the specific levels of protection required for each task at the site(s). The following PPE and hygiene procedures are offered at the site:

Universal Precautions - Workers will be instructed to assume that a significant health risk is present at all times during the project, and will be required to use available PPE and work practices when on the job site. Workers will be instructed on the use of universal precautions through on-site training conducted by the CIH.

Equipment Disinfecting - Workers will be provided with anti-bacterial detergent and instructed on the proper methods of equipment disinfecting. Specifically, seats and interior surfaces on the machine cabs will be disinfected once per shift or if visible liquid is observed.

4.6.1 Levels of Protection

Personnel will wear protective equipment when activities involve known or suspected atmospheric contamination, vapors, gases or particulate that may be generated by site activities. When direct contact with skin-affecting substances may occur, personnel will wear protective clothing.

All site personnel will be required to wear level D personal protective equipment. This will include the following:

- Safety glasses
- Hard Hats
- Protective Footwear as required in EM 385-1-1, 05.A.08
- Safety Vests
- Hearing protection

Staten Island Landfill Debris Disposal Operation

Health and Safety Program

Additional levels of PPE including the use of air purifying respirators as well as foot, hand and body coverings are required when entering the exclusion zone. The following table summarizes the appropriate level of PPE for the various control areas described in Section 2 of this document:

Area	Activity Description	Required PPE
Landfill Entry	Entry monitoring to the landfill.	Street clothes. Thermal conditions should be considered.
Exclusion Zone	Handling and transfer of material, mechanical separation, and hand sorting of material.	• Hard hat. • Hearing protection. • Eye protection. • Respiratory protection. • Disposable suite. • Gloves • Protective footwear. • Thermal conditions should be considered. • High visibility vest in areas of high vehicular traffic, and during periods of snow.
Non-regulated Zone	Logistical support including storage and distribution centers for equipment, Forensic stations for various agencies, vehicle parking, mess area activities, management trailers, sprung structures.	• Hard hat. • Hearing protection in designated areas. • Eye protection. • Protective footwear. • Thermal conditions should be considered. • High visibility vests in areas of high vehicular traffic, and during periods of snow.
Designated Traffic Zone	Movement of trucks and other vehicles around the landfill. This includes both operators and pedestrians.	For Operators: • Protective footwear. For Pedestrians: • Hard hat. • Hearing protection in designated areas. • Eye protection. • Protective footwear. • High visibility vest. • Thermal conditions should be considered.
Personal Hygiene Station	Facilitating personal hygiene needs of site personnel.	Street clothes. Thermal conditions should be considered.
Vehicle Washdown Station	Facilitating removal of dirt and debris from exterior of vehicles.	• Hard hat. • Hearing protection in designated areas. • Face Shield. • Protective footwear. • Thermal conditions should be considered. • High visibility vest in areas of high vehicular traffic, and during periods of snow.

4.7 MONITORING

4.7.1 Air Monitoring

This section describes the collection, analysis and interpretation of personal exposure monitoring air samples. The USEPA, in conjunction with the USCG has been conducting perimeter air monitoring on a regular basis. Data from the perimeter monitoring will be posted on a regular basis, and will be available from the USEPA representative.

The purpose of personnel exposure monitoring is to assess individual exposures to chemicals that occur during work shifts while workers are performing a defined work activity. Data collected is compared to established time weighted averages, based on 8-hour work shifts, promulgated by the Occupational Safety and Health Administration (OSHA), or other industry-recognized organizations. These standards are health-based, and are typically considered the concentration below which a worker could be exposed to without experiencing adverse health effects. Since the project requires 12-hour work shifts, it will be necessary to adjust exposure criteria appropriately. This may include the adjustment of the allowable exposure limit, or adjusting air data to compensate for the longer work shift.

Methods--

The potential of worker exposure is dependent on several key variables:

Work activities – The establishment of job classifications will be used to assess different groups of workers having similar potential exposure issues. Assessment of work groups will be periodically reviewed and may be re-defined as process methods are modified. Potential parameters may vary from one work group to another, and therefore, the chemical parameters being sampled for may vary between different work groups. The following work groups have been identified:

- **Hand sorters** – This includes workers using hand tools to manually sift through debris on the ground.

Staten Island Landfill Debris Disposal OperationHealth and Safety Program

- **Grapple operators** – This includes workers operating equipment used to load debris onto mechanical separators.
- **Loader operators** – This includes workers operating front end loaders.
- **Bulldozer operators** – This includes workers operating bulldozers.
- **Truck operators** – This includes workers who operate vehicles that transport bulk debris through the site.
- **Mechanical separator sorters** – This includes workers sifting through fine debris being ejected from the various mechanical separators.
- **Site Managers** – This includes personnel who will have intermittent exposure based on their proximity to operations involving the handling of material. For the most part, this includes personnel who spend a significant amount of time in trailers, but also spend time in the field.
- **Torch cutters** – This includes personnel performing cutting operations particularly in the barge operations area.
- **Field support personnel** – This includes workers who spend the majority of their time near operations that may result in direct exposures.
- **Mechanical cutters** – This includes personnel performing manual cutting of damaged vehicles brought to the landfill.
- **Perimeter support personnel** – This includes personnel who have limited exposure potential because they spend most of their shift in trailers, or in areas near the perimeter of the site.

- **Personal Hygiene Specialists and Safety Monitors** – This includes personnel who are assigned to decontamination activities such as personnel decontamination as well as vehicle decontamination.

Homogeneity of Material – The amount of a hazardous agent involved with a process is directly proportional to the potential for worker exposure to that parameter. If the concentration of a parameter is constant in a given process (homogeneous), it can be assumed that the exposure to the parameter will also be constant. In this situation, exposure monitoring conducted over a relatively short period of time (several work shifts) can be used to create a negative exposure assessment. The subject work of this project does not involve the processing of material with a homogeneous concentration of potential hazardous agents. As such, air-sampling frequencies will have to anticipate fluctuations associated with potential hazardous agents in the waste stream.

Ambient Conditions – Temperature, wind, and relative humidity will impact worker exposure. The exact impact of these factors is difficult to predict, and therefore, air samples will be collected over a variety of different ambient conditions.

Individual Work Practices – The subject work of this project is labor-intensive, and requires constant hand manipulation of materials that may contain hazardous agents. While the overall work process should be considered standardized, there exists variations in individual work methods that may influence exposures. To minimize this influence, multiple samples will need to be collected from workers within each work group.

Air samples will be collected following current methods established by the National Institute for Occupational Safety and Health (NIOSH). If the event that NIOSH methods do not exist, or are deemed not practical for an application, an alternative method will be used. The alternative method will require validation by the laboratory conducting the analysis, and will have to produce sufficient written documentation to that effect.

Exposure monitoring will encompass a combination of qualitative grab samples, short term, and whole shift monitoring as described below.

- Direct reading instruments and colormetric detector tubes may be used to screen work activities for chemical parameters. While a useful tool for establishing sampling parameters, this types of sampling will not be used to establish negative exposure assessments.

Whole shift monitoring – This typically is based on an 8 hour work shift, since OSHA exposure limits often are based on an 8 hour time-weighted average. The subject work operation involves shifts of 12 hour shifts rather than 8 hours, and will require that exposure samples be collected over a 12 hour period. The interpretation of the data will require that OSHA exposure limits be amended to account for the longer work shift. Additionally, the exposure limits will have to take into account a 7-day workweek, rather than the standard 5-day workweek. Adjustments to exposure limits will be made on a case-by-case basis.

Short duration monitoring – Several chemical parameters have established exposure limits based on 15 or 30-minute exposures. This will require that samples for some parameters be collected during activities that have the greatest potential for exposure during a given work shift. In addition to 15 and 30-minute duration, some chemical parameters have established ceiling limits. Grab samples may be required to be collected to document compliance with ceiling exposure limits.

Frequency--

Due to the number of variables involved with assessing worker exposures specific to this project and the number of site workers, the establishment of comprehensive exposure data for a statistically significant percentage (25%) of the work force will be difficult, and can not feasibly be achieved in a single shift. Initially, exposure monitoring efforts will be concentrated on activities most likely to result in elevated exposures. These classifications include those work groups where employees spend the majority of their work shift handling debris, or otherwise working in close proximity to debris being handled.

4.7.2 Information Management And Dissemination

Air sample data, both perimeter and personnel exposure monitoring, will be summarized and disseminated accordingly. Data may be entered into a data base, which will be updated daily, will be

posted in a summary fashion to be determined near the mess area, and will be available upon request by any party involved with the project. Written interpretations will be posted weekly. These interpretations will include a summary of data, trends in exposures, and recommendations to control, or otherwise manage exposures.

4.7.3 Site Safety Monitoring

General site safety will be monitored through a team of Site Safety Observers. These individuals will be observing various operations in and around the exclusion zone including, but not necessarily limited to the following:

- Hand sorting.
- Mechanical sorting.
- Material transfer operations.
- Torch cutting.
- Mechanical cutting.
- Trucking.
- Building erection.

The Site Safety monitors are not intended to provide enforcement of site safety requirements, but to facilitate a safer working environment. Their objectives on this project include:

- Assisting site workers with Personal Protective Equipment.
- Providing assistance on the implementation of the Health and Safety Plan.
- Assessing potential safety hazards.
- Being available to site workers to present and discuss safe work practices.
- Recording potentially unsafe work condition and reporting the conditions to the appropriate supervisors.

Each Site Safety Observer will utilize a summary checklist to prompt them to make observations of potentially un-safe work practices or conditions. The prompt items include:

Staten Island Landfill Debris Disposal Operation**Health and Safety Program**

Personal Protective Equipment:

- Respirators, being worn, being worn properly.
- Hard hat.
- Hearing protection being worn where required.
- Eyes.
- Protective clothing.
- Gloves/hand protection.
- Boots, foot protection.

Work Practices:

- Worker positioning around equipment.
- Standing on operating equipment.
- Eating, drinking in exclusion zone.
- Use of hand tools.
- Storage of hand tools when not in use.

Material Handling and Storage:

- Workers in proximity to unstable piles.
- Workers in proximity to transfer/dumping of material.
- Potentially dangerous debris in waste stream (gas tanks, compressed gas).

Vehicle Safety:

- Backup alarms on vehicles.
- Dragging rebar/debris.
- Fire extinguishers on equipment.
- Unsafe mounting/riding on vehicles.
- Headlights/Taillights
- Cracked windshields
- Fenders/mud flaps
- Excessive speed.
- Unattended vehicles with motor running.

Staten Island Landfill Debris Disposal Operation

Health and Safety Program

- Use of spotters for backing up.

ATV Safety:

- Exceeding payload.
- Gloves/helmet.
- Not used during nighttime operations.
- No passengers.
- Equipped with warning signal device.

Illumination:

- Conveyors 110lx.
- Parking 3 lx.
- Fueling areas 5 lx.
- Docks/loading areas 3 lx.
- Inspection areas 50 lx.
- General outdoors 3 lx.
- Dressing area 10 lx.

Lockout/Tagout:

- Use of L/T devices.
- Use of proper L/T devices.
- Observation of unsafe acts during L/T/ operations.

For Building Erections:

- Fall Protection
- Proper use of scaffolds and ladder.
- Proper use of power tools.
- Lifts being used in a safe manner.

For Operations That Use Torch Cutting:

- No open flames near flammable material or compressed gasses.

- No cutting of containers.
- Skin and special eye protection.
- Fire extinguishers.
- Torch cutting being performed on stable, secure platforms.
- Prior to use, hoses and tips are inspected.
- Valves shut off when work is suspended.

Written data collected by the Site Safety Observers will be summarized, and will be distributed to the respective agencies at the daily site safety meeting.

7.7.4 Monitoring Activities By Agencies

The following is a summary of monitoring activities by various agencies:

USEPA/USCG--

- Perimeter monitoring :
 - Airborne asbestos at 8 fixed locations, analysis by phase contrast microscopy and Transmission Electron microscopy (AHERA Method).
 - Particulate monitoring at eight fixed locations by use of Data Ram direct reading instruments.
- Exclusion Zone Monitoring:
 - Airborne asbestos at 4 fixed locations, analysis by phase contrast microscopy and Transmission Electron microscopy (AHERA Method).
 - Personal Hygiene Station:
 - Airborne asbestos at 2 fixed locations, analysis by phase contrast microscopy and Transmission Electron microscopy (AHERA Method).
- Barge Operations:
 - Airborne asbestos at 2 fixed locations, analysis by phase contrast microscopy and Transmission Electron microscopy (AHERA Method).
- Bulk Sample Collection:
 - Collection of asbestos bulk samples at various locations at the site. Frequency is 30 samples per week. Analysis by Polarized Light Microscopy.

Staten Island Landfill Debris Disposal Operation

Health and Safety Program

- Direct Reading/other:
 - Measurements for explosive atmosphere, oxygen, hydrogen sulfide, and carbon monoxide every hour in the supply tent, personal hygiene station, mess area, and the covered sifting area. Other building will be evaluated on a case-by-case basis.

FBI/Public Health--

- Personal exposure monitoring for airborne asbestos on workers in the building seven area. Analysis by Phase Contrast Microscopy and Transmission Electron Microscopy (NIOSH 7402).
- Personal exposure monitoring for airborne asbestos on NYPD officers. Analysis by Phase Contrast Microscopy and Transmission Electron Microscopy (NIOSH 7402).
- Personal exposure monitoring for metals, silica, total volatile organic chemicals, and noise of FBI workers in the building seven area and NYPD employees in the main work area. Analyses by appropriate NIOSH method. Frequency varies.

PHILLIPS AND JORDAN/EE&G--

- Exclusion Zone:
 - Personal exposure monitoring for airborne asbestos on Phillips and Jordan, Department of Sanitation (New York), and NYPD workers. Analysis by Phase Contrast Microscopy, with 20% (approximately) of samples being analyzed by Transmission Electron Microscopy (NIOSH 7402).
 - Personal exposure monitoring for airborne metals and total particulate on Phillips and Jordan, Department of Sanitation (New York), and NYPD workers. Analysis by NIOSH method 7300/0500 (gravimetric).
 - Noise monitoring on employee workers near heavy equipment.
 - Direct read monitoring for organic vapors.
 - Luminescence surveys.
- Barge Operation:
 - Personal exposure monitoring for airborne asbestos on Department of Sanitation (New York). Analysis by Phase Contrast Microscopy, with 20% (approximately) of samples being analyzed by Transmission Electron Microscopy (NIOSH 7402).

Staten Island Landfill Debris Disposal OperationHealth and Safety Program

- Personal exposure monitoring for airborne metals and total particulate on Department of Sanitation (New York) workers. Analysis by NIOSH method 7300/0500 (gravimetric).
- Safety Inspections:
 - Conducting safety observation inspections in work areas (except Building 7). Findings to be reported to agencies at daily site meeting.
 - Conducting safety inspections of P&J subcontractors. Responsible for enforcing subcontractor's compliance to H&S Plan.

SECTION 5.0 – RESPIRATORY PROTECTION PROGRAM

5.1 PURPOSE

Since certain tasks associated with the operation of the landfill for this project may require the use of respiratory protection, this section was developed to provide general guidance associated with the use of respirators. Whenever possible, work practices and engineering controls will be used to manage personnel exposure to airborne hazards. Where effective work practices and engineering controls are not possible, respiratory protection will be used in accordance to the generalized procedures described in this section. For additional information refer to 29 Code of Federal Regulations (CFR) 1910.134.

5.2 APPLICABILITY AND RESPONSIBILITY

This plan applies to personnel who may use respiratory protection on a routine or occasional basis. This includes the use of disposable and reusable air purifying respirators. Each agency and/or contractor is responsible for safety and well being of employees as it relates to respiratory protection. Agencies and contractors shall be required to demonstrate compliance with a written respiratory protection program that complies with OSHA. Agencies and contractors are responsible for identifying tasks and personnel that may use respirators and conducting self-compliance monitoring.

5.3 TRAINING

Agencies and contractors are ultimately responsible for the training of their employees. General respiratory training and fit testing for will be available onsite by EE&G. Training will generally include the following:

- Physical and medical requirements for respiratory use.
- Methods for inspecting, fitting, and using respirators.
- Methods for fit checking.
- Respirator maintenance.

- Limited medical evaluation.

5.4 RESPIRATORY SELECTION

Based on current site conditions, initial assessments indicate that half-face negative pressure respirators equipped with High Efficiency Particulate Air (HEPA/OV) filters will be sufficient to provide suitable respiratory protection in the exclusion zone. As conditions change, work areas and job tasks will be assessed to evaluate respiratory protection.

5.5 MEDICAL SURVEILLANCE

Prior to wearing respirators, agencies and contractors will be required to verify that their personnel are physically able to wear a respirator. Limited medical evaluations will be offered in the PPE structure during shift changes.

5.6 RESPIRATOR FIT TESTING

Fit testing for employees required to wear respirators will be conducted. A temporary fit testing facility will be established at the site and operated by EE&G.

5.7 RESPIRATOR INSPECTION AND MAINTENANCE

Personnel will be individually responsible for proper maintenance, inspection, cleaning, and storage of respirators. Agencies and contractors are responsible for monitoring this program.

SECTION 6.0 - COMMUNICATION & ACCIDENT PREVENTION

6.1 SITE COMMUNICATION

6.1.1 Key Personnel

The following personnel will be critical to planned activities at the various sites covered by this plan. The organizational structure will be reviewed and updated periodically.

HEALTH AND SAFETY PERSONNEL

Title	Name/Phone	Company	Function
Health and Safety Personnel	Paula Higgins	USACE	Provide technical S&H oversight for Corps employees and safety QA for agencies and contractor. Has authority to stop contract work that represents an IDLH.
Safety & Loss Control Manager	Steve Thompson 917-597-9845	P&J	Primary point of contact for all health & safety issues and primary liaison between site operations and USACE, and Law enforcement contacts.
Site Safety and Health Officer	David Reed or Kirk Smith 904-874-6607 813-416-0106	EE&G	Overall coordination and management of site health & safety and environmental technicians. Responsible for all submittals and written correspondence to Safety & Loss Control Mgr.
Certified Industrial Hygienist	Jay Sall, CIH 305-710-0372	EE&G	Initial site hazard identification and off-site review of technical submittals. Responsible for the technical direction of Health & Safety program.
Health and Safety Officer	Eric Osnes	FBI	Responsible for communicating and overseeing own employees with respect to this Health and Safety Guidance Manual.
Health and Safety Officer	Amir Rasheed 347-231/0439	NYPD	Responsible for communicating and overseeing own employees with respect to this Health and Safety Guidance Manual.
Health and Safety Officer	Lisa Roberts 917-816-7860	USCG	Responsible for communicating and overseeing own employees with respect to this Health and Safety Guidance Manual.

Staten Island Landfill Debris Disposal Operation**Health and Safety Program**

Health and Safety Officer	John Rhodes 732-750-3270	OSHA	Onsite Representative of OSHA.
Health and Safety Officer	Andrew Confortini 732-689-0017	USEPA	Responsible for communicating and overseeing own employees with respect to this Health and Safety Guidance Manual.
Health and Safety Officer	Ed Brescia 212-837-8454	NYDS	Responsible for communicating and overseeing own employees with respect to this Health and Safety Guidance Manual.
Health and Safety Officer	Kelly McKinney 917-731-5593	NYDOH	Responsible for communicating and overseeing own employees with respect to this Health and Safety Guidance Manual.
Health and Safety Officer	Gubbie Murthy	NYSDEC	Responsible for communicating and overseeing own employees with respect to this Health and Safety Guidance Manual.

The contact numbers are provided above so that health and safety related issues can be effectively communicated to each entity at the site.

6.2 COORDINATING AND CONTROLLING WORK ACTIVITIES

The Project Directors for Phillips & Jordan will be responsible for the overall direction and management of the construction employees and subcontractors. Otherwise, each entity will be responsible for their own implementation and oversight of this plan.

6.1.1 Visitors and Unknown Site Representatives

All visitors will be required to obtain the appropriate vehicle passes from the NYPD and badges from P&J, or approved Federal agency

New site employees should attend an introductory meeting to be made aware of site conditions. EE&G will be conducting orientation meetings, as well as each entity may be conducting their own site safety orientation meetings. In these situations, the site indoctrination provided by the individual agencies will supercede the guidance of this section. The site orientation session should include the following minimum elements:

- Introduction to the site Health and Safety Plan.
- Access to the site and clearance requirements.
- Security areas and concerns.
- Information flow and organizational chain-of-command.
- Training for specific job function/responsibilities.
- Training for hazard recognition/accident awareness and prevention.
- Safety and environmental controls in place.
- Existing or potential hazards.
- Universal precautions.
- Hazcom/lockout-tagout.
- Documentation of training.
- Heavy equipment and safety inspections.

In addition to the introductory site orientation, each entity is encouraged to conduct at least weekly "tool box safety meetings" with its employees.

6.3 REPORTING PROCEDURES

6.3.1 Investigation and Reporting of Accidents

Each entity will conduct its own accident investigations. Information pertaining to accident reporting and investigations should be made be available to the employees of each entity. Immediate notification will be made to the agency's safety officer when an injury or illness results in a fatality, permanent total or permanent partial disability, hospitalization of any employees, or an accident in which property is significantly damaged.

6.3.2 Exposure Reporting

P&J will prepare and provide to all entities at the 11:00 am safety meetings periodic reports that summarize the findings of air sample and exposure monitoring data. Other agencies and entities are encouraged to provide any data they are collecting to the others. Results of air sampling data will be available to site personnel, upon request.

6.3.3 Maintenance of Data Logs

Records of exposure data, accident reports and field logs will be maintained for the duration of the project by each entity.

6.4 EMERGENCY RESPONSE

The FBI has an onsite medical staff located near the mess tents that can provide immediate response to medical related emergencies. A heli-pad is constructed on site for easy access to Medivac if necessary. An EE&G M.D. and medic will be present in the PPE Sprung Structure during shift changes.

6.4.1 Emergency Medical Care

Due to the nature of operations, police and medical assistance is available at the site. In the event of a medical emergency, contact the onsite agency. Additionally, in the event police aid is required, contact the onsite agency. If additional police or medical assistance is necessary, contact will be done through the appropriate agency. Additional police or medical In the event additional assistance is needed, please contact the following:

Agency/Facility**Phone#**

Police:

Agency provided services.

Fire:

911

Hospital:

Agency provided medical services.

Staten Island Landfill Debris Disposal Operation

Health and Safety Program

RECORD OF SITE SAFETY AND HEALTH PLAN REVIEW

Employer Name: _____

Employer Address: _____

Employer Supervisor (Print): _____

The undersigned have attended the site orientation, received, reviewed and understand elements presented in this plan.

_____	_____
Name (print)	Signature
_____	_____
Name (print)	Signature
_____	_____
Name (print)	Signature
_____	_____
Name (print)	Signature
_____	_____
Name (print)	Signature
_____	_____
Name (print)	Signature
_____	_____
Name (print)	Signature