

**Accident Prevention Plan/Site Safety and
Health Plan for the Phase 2 Remedial
Investigation of the Tonawanda Landfill
Operable Unit, Tonawanda, New York**

**Buffalo District
Formerly Utilized Sites Remedial Action Program**

**Prepared by:
American Remediation Solutions and Environmental Corporation (ARSEC)
2609 North River Road
Port Allen, LA 70767**

**For:
U.S. Army Corps of Engineers – Buffalo District
Formerly Utilized Sites Remedial Action Program
Contract No. W912P4-07-D-0009, Delivery Order 0003**



February 2010, Revision 1

7.1 SUBMITTAL REQUIREMENTS SUMMARY

Submittal Requirements Summary

Submittal Schedule

S Prior to Shipment
 A Per S/C Schedule
 M Prior to Mobilization
 W Prior to Commencing Work
 Y Prior to Progress Payment

Submittal Type Required

O Original
 P Print/Photocopy
 E Electronic Format
 M Microfilm
 PH Photograph

Classification

FIO For information only
 R1 For PDT Review
 R2 For CX/LRD/HQ Review

SUBMITTAL REQUIREMENTS SUMMARY

NOTICES

- To each item submitted, attach a copy of this form and circle the title of the item being submitted.
- Failure to submit required submittals as delineated on this form may result in withholding of payment in accordance with provisions of the contract.
- The Contract Administrator is responsible for distributing submittals to the requesting Department (e.g., Construction). The Department is responsible for further distributions (e.g., Site Superintendent).

	Submittal	Scope of Work (SOW) Paragraph	Classification	ITR Required	Submittal Schedule (Calendar Days after NTP)	Submittal (No.) and Type
1	Site Map	3.1	R1	Yes	15	O
2	Draft Sampling/Analysis Plan	3.2.1	R1	Yes	30	O
3	Draft APP/SSHP	3.2.2	R1	Yes	30	O
4	Draft Quality Control Plan and ITR documentation	3.2.3	R1	Yes	30	O
5	Final Work Plans	3.2	R1	Yes	60	O
6	Boring Logs	3.5.3	R1	Yes	As generated	O, E
7	Electronic Data Deliverable	3.7.1	R1	Yes	180	E
8	Risk Assessment Data Base	3.7.2	R1	Yes	180	E
8	Draft Project Report	3.9	R1	Yes	180	O, E
9	Final Project Report	3.9	R1	Yes	210	O, E
10						
11						

ITR Checklist

Project Number: W912P4-07-D-0009, DO 0003		ITR Number: APP/SSHP-05	
Applicable Definable Feature of Work: APP/SSHP –Rev. 1			Schedule ID: NA
Submittal? Y <input checked="" type="checkbox"/> N <input type="checkbox"/> : If yes, title: APP/SSHP, Rev. 1		In-Process Review <input type="checkbox"/> Final Review <input checked="" type="checkbox"/>	
ITR Team Leader: Indicate whether the criterion was met by checking Yes or No. If the criterion is not met, note in Remarks/Issues section.			
Review Criteria:	Results of Review	Initial of ITR Lead	Date Reviewed
1. Project or product meets customer’s scope, intent, and quality objectives.	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	DW	02/09/10
2. Formulation or evaluation of alternatives is consistent with applicable regulations and guidance.	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input checked="" type="checkbox"/>	DW	02/09/10
3. Concepts and project costs are valid.	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input checked="" type="checkbox"/>	DW	02/09/10
4. Relevant engineering and scientific disciplines have been effectively integrated.	Y <input checked="" type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	DW	02/09/10
5. Computer models and methods of analysis were used and basic assumptions were valid and used for the intended purpose.	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input checked="" type="checkbox"/>	DW	02/09/10
6. Source, amount, and level of detail of the data used in the analysis were appropriate for the complexity of the project.	Y <input checked="" type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	DW	02/09/10
7. The project or product complies with USACE/ARSEC approved SOPs.	Y <input checked="" type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	DW	02/09/10
8. Content is sufficiently complete for the applicable project phase.	Y <input checked="" type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	DW	02/09/10
9. Project documentation is appropriate and adequate for the project phase.	Y <input checked="" type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	DW	02/09/10
Remarks/Issues: Document is Final (Revision 1).			
I certify that this independent technical review was conducted in accordance with ARSEC-Q-22, <i>Independent Technical Review</i> , and USACE approved practices. Resolution of identified issues has been achieved and documented accordingly.			
ITR Lead: [Redacted]	Signature: [Redacted]	Date: 02/09/10	
Project Manager: [Redacted]	Signature: [Redacted]	Date: 02/09/10	

Commenter	Comment No.	Reference	Comment	Author's Response
█	1	Page 2-5	The CQC Phased Work should be an attachment to the daily DQCR.	ARSEC will submit the CQC Phased Work paperwork with the daily DQCR.
█	2	Figure 3-1	There are only two geologists listed on the organizational chart but three drill rigs being utilized in your schedule.	Penny Baxter is a PG and will support the drilling as necessary.
█	3	Figure 5-1	The schedule does not list the installation of ground water temporary well points.	The schedule shows the installation and sampling of the 14 Well Points as an activity entitled Groundwater sampling. No revision of the schedule and/or QCP is required.

Commenter	Comment No.	Reference	Comment	Author's Response
[REDACTED]	1	APP-SSHP Section 9.15.5.1	<p>The text and Table 9-1 do not match. The text states that Level D will be used and Modified D if air sampling warrants a downgrade. On Table 9-1 Modified D is more intensive than Level D so that would be an upgrade. Either way I think the protective equipment listed for the C/D PPE level should be used for all drilling and associated activities/personnel. It is standard industry practice where there are unknowns and some of the IA's have not been sampled previously or to the extent we are sampling them.</p>	<p>The text and table will be revised to be consistent. See response to Ms. Widener's comment no. 1. ARSEC has selected the removable contamination limit of 1,000 dpm/100cm² beta/gamma as providing applicable radiological safety for the site. This limit is consistent with NRC removable contamination limits specified in NUREG 1.86. Removable contamination greater than 1,000 dpm/100cm² was not found on site personnel, equipment or vehicles during soil boring activities performed by ARSEC at the Tonawanda OU site in October through December 2009. Additionally, decades of experience remediating similar sites performed by team members SEC and ARS indicate that removable contamination greater than 1,000 dpm/100cm² is generally not encountered until soil contamination levels exceed 10,000 pCi/g. PPE consisting of Tyvek type suits, gloves, boots or shoe covers, with all openings taped, will be initiated when removable contamination levels exceed 700 cpm/100cm². The lower limit of 700 dpm/100cm² will provide a margin of safety to prevent personnel contamination exceeding 1,000 dpm/100cm². Personnel sampling soil material from drilling cores will wear gloves. Radiological PPE will not be required for personnel walking across the site, performing drilling operations, or core inspection activities unless removable contamination levels exceed 700 dpm/100cm². HP technicians will monitor for removable contamination at each boring location and during core sampling evolutions. Personnel shall perform and document a contamination frisk when exiting the Tonawanda OU Investigative Areas. Vehicles and equipment shall be surveyed for removable contamination prior to leaving the Tonawanda OU site. For chemical exposure, a 4-Gas and a PID will be used to monitor worker exposure. If the readings exceed 5 ppm, all personnel within the work zone will be required to upgrade from a modified Level D to Level C PPE.</p>

Commenter	Comment No.	Reference	Comment	Author's Response
[REDACTED]	2	APP-SSHP Page D-24	Does this AHA require Zebra personnel to have the Rad Worker II training?	The AHA will be revised deleting the RWT II requirement. All personnel entering Investigative Areas shall have as a minimum site specific training that addresses the elements of Rad Worker II pertinent to the activities to be performed. Any onsite personnel that does not currently have Rad Worker II or similar, equivalent training shall be briefed/trained by the ARSEC Site RSO in Rad Worker equivalent site specific training. The APP-SSHP Page D-24 shall be changed to reflect this requirement.

Commenter	Comment No.	Reference	Comment	Author's Response
[REDACTED]	3	RSP Section 8.8	<p>The control zones described here are not really applicable to the activities we are performing on-site. I suggest a standard industry procedure of setting up some rad rope from the back of the drill rig to the sampling table, to include one side of the table. The drillers would be inside the area in Modified Level D (booties,tyvek,gloves) and lay out the samples on the table for the people on the other side. Those people would wear Modified Level D (gloves, tyvek if sloppy). Upgrade PPE levels as necessary. I suggest this procedure for all IA's regardless of routine contamination control monitoring.</p>	<p>These suggestions will be taken into consideration by ARSEC management. Establishment of work area boundaries will be based on practicality and effectiveness and the sound professional judgement of the ARSEC SSHO, SRSO, and PM. Work areas, e.g., core drilling and core sampling areas, shall be conspicuously marked by placing orange safety cones on the ground delineating the work area boundaries. A rope boundary will be established around work areas in the unlikely event that removable contamination levels greater than 700 dpm/100cm² are encountered. The rope boundaries shall be posted with "Caution: Restricted Areas" signs. PPE consisting of Tyvek type suits, gloves, boots or shoe covers, with all openings taped, will be initiated when removable contamination levels exceed 700 cpm/100cm². Personnel sampling soil material from drilling cores will wear gloves. Radiological PPE will not be required for personnel walking across the site, performing drilling operations, or core inspection activities unless removable contamination levels exceed 700 dpm/100cm². HP technicians will monitor for removable contamination at each boring location and during core sampling evolutions. Personnel shall perform and document a contamination frisk when exiting the Tonawanda OU Investigative Areas. RSP Section 8.8 will be changed to reflect that orange safety cones with radiological safety markings will be used to delineate the drilling and sampling work zones. PPE consisting of Tyvek suits, gloves, and shoe covers or easily decontaminated boots shall be worn in the work zones when initialing drilling activities in new Investigative Areas or when removable contamination greater than 700 dpm/100cm² is encountered. PPE levels shall be downgraded at the discretion of the site RSO and SSHO based on the results of on-site monitoring and offsite analytical results, including the analytical results from the 50+ borings installed in November 2009.</p>

Commenter	Comment No.	Reference	Comment	Author's Response
██████████	1	APP/SSHP (9.15.1)	"A Quad-Gas monitor will serve as the first line of qualitative sampling in detecting organic compounds at the Site during intrusive activities. Total vapor concentrations held below 1ppm would result in exposures below the PEL for the compounds that may be present." - What happens if vapor concentrations >1ppm are found??	This section of the APP/SSHP has been revised in accordance with the "White Paper" entitled Tonawanda Landfill Investigation - Chemical Monitoring Position Paper. This position paper indicates that a 4-Gas analyzer and a PID will be used to monitor/screen the potential release of chemical vapors to project personnel located within the work zone. If the levels exceed 5 ppm, the workers will be required to upgrade from modified Level D PPE to Level C PPE for that boring and other borings in the vicinity.
██████████	2	APP/SSHP (9.15.7.2)	This section says "Quad-Gas monitors will be used to monitor for VOCs, periodic readings will be taken at least once during the morning and once in the afternoon each day that drilling activities are performed, and at greater frequencies based on visual or olfactory observations as drilling proceeds." This should be more prescriptive and say that it will be used at every location... to match up with section 9.15.1 which says it will be used as a first line of sampling for worker safety. Since each location is different and could have vastly different constituents buried underneath... sampling once in the morning and once in the afternoon will not ensure the safety of personnel onsite throughout the day.	Plan will be revised to include monitoring at each location, in accordance with the ARSEC position paper entitled Tonawanda Landfill - Chemical Monitoring Position Paper. Section 9.15.7 will be revised to be consistent with the ARSEC White Paper.
██████████	3	APP/SSHP (9.15.7)	"Quad-Gas monitor will be measuring LEL, H2S, Co and O2... and PID monitoring, if used, will be conducted with a 11.7eV lamp." This should be more prescriptive and say what will measure VOC's and that it will be used. In section 9.15.7.2 it says that a Quad-Gas monitor will measure VOC's which contradicts this section... what is being used to measure VOC's?	Plan will be revised to include what the PID can measure; quad gas monitor capabilities will be corrected to be consistent with the first statement.

Committer	Comment No.	Reference	Comment	Author's Response
[REDACTED]	4	APP/SSHP (9.15.7)	"Action levels above background and monitoring frequency, as determined by real time instrumentation are as follows:• Organic Vapor At Work Site: 5 ppm - upgrade PPE 10 ppm - stop work" - if there are real-time instrumentation action levels then you need to specifically state when and how you are going to monitor for these levels, i.e. use of a PID to measure VOC's at each location or every core, etc. Also, these values are larger than the 1ppm PEL exposure limit mentioned in section 9.15.1	Plan will be revised to include monitoring at each location, in accordance with the ARSEC position paper entitled Tonawanda Landfill - Chemical Monitoring Position Paper. Section 9.15.7 will be revised to be consistent with the ARSEC White Paper.
[REDACTED]	5	APP/SSHP (Table 10-1 Task 4&5)	Chemical hazards – These tasks involve intrusive activities and potential contact with site contaminants VOC and metal contamination may possibly exist in the soil being drilled. Initial drilling activities will be monitored with a Quad-Gas monitor to establish that hazardous conditions do not exist. I'm not sure if this is saying only initial readings of VOC's will be measured for sampling or if VOC will be continuously monitored throughout drilling activities.	ARSEC will measure using for gas and other pertinent instrumentation long enough to develop a data base during the initial phases of drilling to guide the requirement for additional monitoring and worker PPE.
[REDACTED]	1	APP	In both the APP-SSHP and FSP, it appears that ARSEC has replaced use of the PID for in-field borehole screening with the 4-gas meter. It looks like the PID is now only being used for headspace readings of suspect samples. As far as only using the 4-gas meter to screen the boreholes, does ARSEC feel this is appropriate and all inclusive?	ARSEC recognizes the potential for exposure of personnel to radiological and chemical contaminants (VOCs, metals, etc.) and that we will proactively monitor the cores and the borings for hazardous/toxic materials using radiological monitoring equipment and handheld PIDs & 4-Gas analyzers. FSP Section 4.8.2 shall be revised to indicate that PID and 4-gas monitoring shall be periodically performed at the bore hole location during drilling activities. PID screening shall also be periodically performed when cores are split in half for beta screening.

Commenter	Comment No.	Reference	Comment	Author's Response
[REDACTED]	2	APP Cover	Also, as with the QCP, on the APP-SSHP, FSP and QAPP, ARSEC's logo should not be on the front cover, but should be replaced with the Corps of Engineers logo. This was not brought up last time but should be changed now.	The ARSEC logo will be removed. The Corps logo is already on the front cover and will be added to the internal cover.
[REDACTED]	1	APP (General)	<p>In a nutshell, ARSEC, the SSHO, has to ensure that their employees are not being overexposed to chemical and radiological hazards. If the hazards are unknown, then their employees should be wearing respirators (combo filters HEPA for radionuclides and VOC) until they can determine that the level of contaminant is low enough that they don't require them. If they use a 4-gas and PID as a screening tool then they have to justify how it will work to protect against employee exposure - I as a rep of USACE - will in no way tell them that it's OK and that this is sufficient to ensure that employees are not being overexposed...I need to make this clear. In their AHAs they did not mention unknown chemical contamination as a hazard and what methods they would use to control the hazard. Is there just radiological contamination?! I plan on being there on Wednesday.</p> <p>I reread my email of 1/29/2010 and it may sound like I advocated their use of PID as a screening tool - I was basically saying that if that's what they are doing then they at the very least need to check every hole - not just occasionally use the monitor. With unknown contamination, it's best to equip their employees with respirators, tyvek, etc.</p>	Plan will be revised to include monitoring at each location, in accordance with the ARSEC position paper entitled Tonawanda Landfill - Chemical Monitoring Position Paper. Section 9.15.7 will be revised to be consistent with the ARSEC White Paper.
[REDACTED]	1	FSP Table 2-1	FSP, Table 2-1: Judy Leithner has retired. Please update with Jacob (Jake) Zdrojewski	The correction will be made.

Tonawanda Landfill Investigation – Chemical Monitoring Position Statement

2/8/10

Drilling activities at Tonawanda involve using a Geoprobe equipped with coring tools that extract 1.88 inches to 2.5 inches in diameter core. ARSEC contends that the potential for exposure during the drilling operations is mitigated based on the following:

- The core diameter provides for only a small area opening thus reducing the potential for release of particulates or organics.
- The sleeve acetate lining encloses the core further reducing potential for any release.
- The current environmental conditions at Tonawanda (e.g., cold temperatures) minimize the potential for volatilization of organics.
- Wet soil conditions anticipated during the time period of the upcoming boring operations preclude the potential for particulate or organic release.

To further mitigate employee exposure to volatile organic compounds (VOCs), ARSEC proposes to use a photo ionization detector (PID) and a Quad gas monitor for monitoring at the Geoprobe entry point. The drillers and associated personnel stationed within the designated work zone will be required to be in modified level D (booties, tyvek, gloves). If the PID instrument readings rise above five (5) parts per million (5ppm), the personal protective equipment (PPE) must be upgraded from a modified level D to level C with the use of a combination cartridge respirator (P100/organic vapor). Core samples shall be screened with a PID during core extractions and when the soil core is exposed to ambient air during the removal of the acetate liner and subsequent sampling. Additional PID readings will be collected, as required, from the headspace of the sample bottles as they are being processed for shipment to the off-site analytical laboratories.

██████████
ESH / IH Representative

Radiological Controls at the Tonawanda OU Landfill Site

Historical Data

Historical field sampling and gamma survey results at the Tonawanda Landfill Site have indicated the presence of Manhattan Engineer District like material in the operational unit (OU) landfill. Previous investigations indicated MED related material present in soil, groundwater, surface water and sediment. (*Remedial Investigation Report, Tonawanda Landfill Vicinity Property, Tonawanda, New York (USCE, April 2005)*). The USACE April 2005 report included investigations of both the Landfill OU and the Mudflats OU as separate but related parcels.

The report found that thorium-230 concentrations in soil ranged from 1.79 to 31.5 pCi/g; uranium-238 soil concentrations ranged from 1.37 to 27.9 pCi/g; and radium-226 concentrations ranged from 0.65 to 22.6 pCi/g.

The DOE conducted soil sampling activities and the Landfill and Mudflats in 1994 to determine the vertical extent of the radiological contamination at the site. The study found that thorium-230 soil contamination ranged from 1.60 to 660 pCi/g; uranium-238 contamination ranged from 1.31 to 78 pCi/g; and radium-226 soil contamination ranged from 2.22 – 120 pCi/g.

Removable Contamination Levels and PPE

ARSEC has selected the removable contamination limit of 1,000 dpm/100cm² beta/ gamma as providing applicable radiological safety for the site. This limit is consistent with NRC RG 1.86 removable contamination limit for uranium. Removable contamination greater than 1,000 dpm/100cm² was not found on site personnel, equipment or vehicles during soil boring activities performed by ARSEC at the Tonawanda OU site in October through December 2009. Additionally, decades of experience remediating similar sites performed by team members SEC and ARS indicate that removable contamination greater than 1,000 dpm/100cm² is generally not encountered until soil contamination levels exceed 10,000 pCi/g.

PPE consisting of Tyvek type suites, gloves, boots or shoe covers, with all openings taped, will be initiated when removable contamination levels exceed 700 dpm/100cm². The lower limit of 700 dpm/100cm² will provide a margin of safety to prevent personnel contamination exceeding 1,000 dpm/100cm². Personnel sampling soil material from drilling cores will wear gloves. Radiological PPE will not be required for personnel walking across the site, performing drilling operations, or core inspection activities unless removable contamination levels exceed 700 dpm/100cm². HP technicians will monitor for removable contamination at each boring location and during core sampling evolutions. Personnel shall perform and document a contamination frisk when exiting the Tonawanda OU Investigative Areas. Vehicles and equipment shall be surveyed for removable contamination prior to leaving the Tonawanda OU site.

Work Area Boundaries

Work areas, e.g., core drilling and core sampling areas, shall be conspicuously marked by placing orange safety cones on the ground delineating the work area boundaries. A rope boundary will be established around work areas in the unlikely event that removable contamination levels greater than 700 dpm/100cm² are encountered. The rope boundaries shall be posted with "Caution: Restricted Areas" signs.

Respiratory Protection for Airborne Radioactive Materials

Respiratory protection for airborne radioactive materials will be initiated when airborne radioactivity levels are equal to or greater than one Derived Air Concentration (DAC). A person can breathe air at 1 DAC for 2,000 hours before exceeding the annual occupational dose limit of 5 rem total effective dose equivalent (TEDE).

Respiratory protection for airborne radioactive materials will at a minimum consist of a half face respirator fitted with HEPA type cartridges. Monitoring for airborne radioactive materials shall be performed in accordance with the Tonawanda Field Sampling Plan and Radiation Protection Plan.

Airborne radioactive material concentrations greater than one DAC value were not measured during soil boring activities performed by ARSEC at the Tonawanda OU site in October through December 2009. Additionally, experience remediating similar sites indicate that airborne contamination levels greater than one DAC value are generally not a concern until soil contamination levels exceed several 10,000 pCi/g and rarely occur outdoors. Respiratory protection for airborne radioactive materials will not be initiated until an airborne concentration equal to or greater than one DAC value is encountered.

Dosimetry

Federal regulations require the use of personnel dosimetry (e.g., TLDs, OSLs) when it is likely that a person will exceed 10% of the 5 rem annual limit for TEDE or when entering a High Radiation Area. It is highly unlikely that a person will exceed 10% of the 5 rem per year limit at the Tonawanda OU Landfill site. A person continuously exposed to a gamma exposure rate of 50 μ R/hr for an entire year (8,760 hours) will only receive a dose of 0.438 rem (assuming exposure to one microRoentgen for one hour results in a dose of one microRem).

A High Radiation Area is defined as any area where a person could receive a dose in excess of 100 millirems in one hour from the radiation source. High Radiation Areas do not exist at the Tonawanda OU Landfill site, nor is it likely that they will result from soil boring activities. A rough rule-of-thumb of 1,000 gross gamma counts per minute measured with a 2-inch x 2-inch sodium iodide detector is equal to one microRoentgen per hour for high energy gamma can be used to illustrate this point. Using this thumb rule, a gross gamma count rate of 100,000,000 cpm would be needed before a gamma exposure rate of 100 mRem/hour would be achieved. The gross gamma counts rates encountered at the Tonawanda OU Landfill site have been several orders of magnitudes lower than 100,000,000 cpm.

Dosimetry is not required for personnel working at the Tonawanda OU Landfill site. Personnel dosimetry will be provided in the unlikely event that it becomes a regulatory requirement.

Accident Prevention Plan/Site Safety and Health Plan for the Phase 2 Remedial Investigation of the Tonawanda Landfill Operable Unit, Tonawanda, New York

Buffalo District Formerly Utilized Sites Remedial Action Program

**Prepared by:
American Remediation Solutions and Environmental Corporation (ARSEC)
2609 North River Road
Port Allen, LA 70767**

**For:
US Army Corps of Engineers – Buffalo District
Formerly Utilized Sites Remedial Action Program
Contract No. W912P4-07-D-0009, Delivery Order 0003**



February 2010, Revision 1

SIGNATURE SHEET

ARSEC ACCIDENT PREVENTION PLAN AND SITE SAFETY AND HEALTH PLAN FOR THE PHASE 2 REMEDIAL INVESTIGATION OF THE TONAWANDA LANDFILL OPERABLE UNIT, TONAWANDA, NEW YORK

Contract Number: W912P4-07-D-0009, Delivery Order 0003

APP/SSHP [Redacted]

ARSEC - Qualified Person
[Redacted]
(865) 690-0501

02/08/10
Date

APPROVED BY:

By their specific signature, the undersigned certify that they reviewed and provided comments on this APP and SSHP for use during the performance of health physicist services at the Tonawanda Landfill Site, Tonawanda, New York.

[Redacted]

ARSEC - Project Manager
[Redacted]
(864) 879-0018

02/08/10
Date

[Redacted]

ARSEC - Chief Executive Officer
[Redacted]
(225) 381-2991

02/08/10
Date

CONCURRENCE BY:

[Redacted]

ARSEC – Radiation Safety Officer (RSO)
[Redacted], CHP
(716) [Redacted]

02/08/10
Date

[Redacted]

ARSEC – ES&H Manager
[Redacted], PE, CIH, CSP
(865) 256-8812

02/08/10
Date

[Redacted]

ARSEC – Corporate Quality Manager
[Redacted]
(865) 342-7619

02/08/10
Date



TABLE OF CONTENTS

LIST OF APPENDICES.....	iv
LIST OF TABLES.....	v
LIST OF FIGURES.....	v
ABBREVIATION, ACRONYMS, AND SYMBOLS.....	vi
1.0 BACKGROUND INFORMATION.....	1
1.1 INTRODUCTION.....	1
1.2 PURPOSE.....	2
1.3 WORK DESCRIPTION.....	2
1.4 HAZARDS DISCUSSION.....	3
1.5 REFERENCES.....	4
2.0 STATEMENT OF SAFETY AND HEALTH POLICY.....	4
2.1 PROJECT SAFETY GOAL.....	5
2.2 SAFETY PROMOTIONS.....	5
3.0 RESPONSIBILITIES AND LINES OF AUTHORITIES.....	5
3.1 RESPONSIBLE PERSONNEL.....	5
3.1.1 USACE Project Personnel.....	6
3.1.2 Program/Project Manager.....	6
3.1.3 ARSEC ES&H Manager.....	8
3.1.4 ARSEC RSO.....	8
3.1.5 ARSEC Corporate Quality Control Manager (CQCM).....	8
3.1.6 Site Superintendent (SS).....	8
3.1.7 Site RSO (SRSO).....	9
3.1.8 Site Safety and Health Officer.....	10
3.1.9 Other Field Personnel.....	10
3.1.10 Lines of Authority.....	11
4.0 SUBCONTRACTORS AND SUPPLIERS.....	11
5.0 TRAINING REQUIREMENTS.....	12
5.1 SITE-SPECIFIC SAFETY AND HEALTH TRAINING/NEW HIRE PRE-ENTRY BRIEFING.....	12
5.2 BASIC HAZWOPER TRAINING.....	12
5.3 PERIODIC SAFETY AND HEALTH TRAINING FOR SUPERVISORS AND EMPLOYEES.....	12
5.4 EMERGENCY RESPONSE TRAINING.....	13
5.5 CPR AND FIRST AID TRAINING.....	13
5.6 BLOOD BORNE PATHOGEN TRAINING.....	13
5.7 HEARING CONSERVATION TRAINING.....	13
5.8 RESPIRATORY PROTECTION TRAINING.....	13
5.9 PPE TRAINING.....	14
5.10 CONFINED SPACE ENTRY TRAINING.....	14
5.11 FALL PROTECTION TRAINING.....	14
5.12 DRILL RIG TRAINING.....	14
5.13 PPE TRAINING.....	14
5.14 DAILY SAFETY MEETINGS.....	15
5.15 RECORD KEEPING.....	15

6.0	SAFETY AND HEALTH INSPECTIONS.....	15
6.1	WORK TASKS.....	15
6.2	EQUIPMENT AND TOOL INSPECTIONS	15
6.3	PREOCCUPANCY SAFETY INSPECTIONS	16
6.4	ADDITIONAL INSPECTIONS	16
6.5	HAZARD IDENTIFICATION COMMITMENT.....	16
7.0	ACCIDENT REPORTING.....	16
8.0	PROJECT PLANS, PROGRAMS AND PROCEDURES.....	17
8.1	SITE LAYOUT AND ACCESS	17
8.1.1	<i>General Site Access</i>	17
8.1.2	<i>Site Visitor Access</i>	17
8.2	RESPIRATORY PROTECTION.....	19
8.2.1	<i>Respirator Selection</i>	19
8.2.2	<i>Respirator Fit Testing</i>	19
8.2.3	<i>Respirator Assignment</i>	19
8.2.4	<i>Respirator Cleaning, Inspection, Maintenance, Sanitization, and Storage</i>	19
8.3	EMERGENCY RESPONSE	20
8.4	SPILL NOTIFICATION	21
8.5	MEDICAL SUPPORT, FIRST AID AND MEDICAL FACILITIES	21
8.6	PREVENTION OF ALCOHOL AND DRUG ABUSE.....	22
8.7	SANITATION.....	22
9.0	HEALTH HAZARD IDENTIFICATION AND CONTROL.....	22
9.1	HEALTH HAZARD IDENTIFICATION	22
9.2	HEALTH HAZARD CONTROLS.....	23
9.3	HAZARD COMMUNICATION	24
9.4	FIRE PREVENTION AND PROTECTION	24
9.5	HOUSEKEEPING	24
9.6	FALL PROTECTION.....	25
9.7	HEAVY EQUIPMENT OPERATIONS	25
9.8	DRILL RIG SAFETY	26
9.8.1	<i>Inspection & Operations</i>	26
9.8.2	<i>Set Up</i>	26
9.8.3	<i>General Preparatory Drilling Requirements</i>	26
9.8.4	<i>Underground Services</i>	27
9.9	ELECTRICAL HAZARD IDENTIFICATION.....	27
9.10	CONFINED SPACE ENTRY.....	27
9.11	REFUELING AND STORAGE OF FLAMMABLE LIQUIDS	27
9.12	NIGHT OPERATIONS LIGHTING	28
9.13	SEVERE WEATHER.....	28
9.14	BIOLOGICAL HAZARD IDENTIFICATION	28
9.14.1	<i>Tick Bites</i>	28
9.14.2	<i>Poisonous Plants</i>	29
9.14.3	<i>Animal or Insect Bites</i>	29
9.15	SITE SAFETY AND HEALTH PROGRAM.....	30
9.15.1	<i>Site Description and Contamination Characterization [Site Description-see Section 1.1] ...</i>	<i>30</i>
9.15.2	<i>Hazard/Risk Analysis [see Appendix D].....</i>	<i>31</i>
9.15.3	<i>Staff Organization; Qualifications; Responsibilities [see Section 3.0].....</i>	<i>31</i>

9.15.4 Training- General, Supervisor, and Project Specific [see Section 5.0 and Appendix E].....31

9.15.5 PPE- Personal Protective Equipment.....31

9.15.6 Medical Surveillance.....33

9.15.7 Exposure Monitoring/Air Sampling Program [see Appendix E for Radiological Monitoring Requirements].....34

9.16 HEAT AND COLD STRESS – PROCEDURES AND PRACTICES35

 9.16.1 Heat Stress.....35

 9.16.2 Cold Exposure.....36

9.17 SOPs; STANDARD OPERATING PROCEDURES; ENGINEERING CONTROLS; WORK PRACTICES38

9.18 SITE RULES/PROHIBITIONS [SEE SECTION 9.2].....38

9.19 WORK PERMIT REQUIREMENTS [SEE APPENDIX E].....38

9.20 MATERIAL HANDLING PROCEDURES [SEE APPENDIX B].....38

9.21 SITE CONTROL MEASURES.....38

9.22 PERSONAL HYGIENE AND DECONTAMINATION39

9.23 EQUIPMENT DECONTAMINATION40

9.24 EMERGENCY EQUIPMENT AND FIRST AID [SEE SECTION 8.5].....40

9.25 EMERGENCY RESPONSE AND CONTINGENCY PROCEDURES [SEE APPENDICES C, ARSEC SOP HS-001, SECTION 11 AND APPENDIX D].....40

10.0 RISK MANAGEMENT PROCESSES.....41

 10.1 ACTIVITY HAZARD ANALYSES.....41

LIST OF APPENDICES

APPENDIX A: ARSEC APP/SSHP ACKNOWLEDGMENT FORM A-1

APPENDIX B: ARSEC CORPORATE ENVIRONMENT, SAFETY, AND HEALTH MANUAL AND PROCEDURES (CD VERSION) B-1

APPENDIX C: EMERGENCY CONTACT LIST AND HOSPITAL DIRECTIONS C-1

APPENDIX D: ARSEC PRELIMINARY DRAFT ACTIVITY HAZARD ASSESSMENTS (AHAS) FOR THE PRE-REMEDIAL VOLUME UNCERTAINTY REDUCTION SUBSURFACE SOIL SAMPLING AT THE TONAWANDA LANDFILL FUSRAP SITE, ERIE COUNTY, NEW YORK (TOWN OF TONAWANDA)..... D-1

APPENDIX E: RADIATION SAFETY PLAN FOR THE PHASE 2 REMEDIAL INVESTIGATION OF THE TONAWANDA LANDFILL OPERABLE UNIT, TONAWANDA, NEW YORK E-1

APPENDIX F: APP/SSHP CHECKLIST FOR THE PHASE 2 REMEDIAL INVESTIGATION OF THE TONAWANDA LANDFILL OPERABLE UNIT, TONAWANDA, NEW YORKF-1

APPENDIX G: RESUMES OF SAFETY PERSONNEL FOR THE PHASE 2 REMEDIAL INVESTIGATION OF THE TONAWANDA LANDFILL OPERABLE UNIT, TONAWANDA, NEW YORK.....G-1

LIST OF TABLES

TABLE 9-1.	PERSONAL PROTECTIVE EQUIPMENT FOR ON-SITE SAMPLING AND SURVEYING ACTIVITIES	32
TABLE 9-2.	RECOMMENDATIONS FOR WORK/REST CYCLE DURATIONS TO REDUCE HEAT STRESS.....	36
TABLE 9-3.	WIND CHILL FACTORS.....	37
TABLE 10-1.	ACTIVITY HAZARDS.....	41
TABLE 10-2.	EQUIPMENT AND TRAINING REQUIREMENTS.....	45

LIST OF FIGURES

FIGURE 3-1.	ARSEC TONAWANDA LANDFILL PROJECT TEAM ORGANIZATIONAL STRUCTURE	7
FIGURE 8-1.	TONAWANDA LANDFILL INVESTIGATIVE AREAS	18

Remainder of this page intentionally blank

ABBREVIATIONS, ACRONYMS, AND SYMBOLS

ACGIH	American Conference of Governmental Industrial Hygienists
AHA	Activity Hazard Analysis
ALARA	As Low as Reasonably Achievable
APP	Accident Prevention Plan
ARSEC	American Remediation Solutions and Environmental Corporation
BBP	blood borne pathogens
B.S.	Bachelor of Science
CD	compact disc
CFR	Code of Federal Regulation
CHP	Certified Health Physicist
CIH	Certified Industrial Hygienist
CO	Contracting Officer
COC	chemicals of concern
COR	Contracting Officer Representative
CPR	Cardiopulmonary Resuscitation
CQCM	Contractor Quality Control Manager
CQCSM	Contractor Quality Control Systems Manager
CRZ	Contamination Reduction Zone
CSP	Certified Safety Professional
dBA	decibels (A-weighted scale)
DOT	Department of Transportation
EM	Engineer Manual
EPA	Environmental Protection Agency
ES&H	Environmental, Safety, and Health
EZ	Exclusion Zone
FUSRAP	Formerly Utilized Sites Remedial Action Program
GWS	gamma walkover survey
HAZWOPER	Hazardous Waste Operations and Emergency Response
HDPE	high density polyethylene
HP	health physics
HTRW	Hazardous, Toxic, and Radioactive Waste
IDW	investigation derived waste
MSDS	Material Safety Data Sheet
NIOSH	National Institute of Occupational Safety and Health
NRC	Nuclear Regulatory Commission
NRRPT	National Registry of Radiological Protection Technologists
NYSDEC	New York State Department of Environmental Conservation
NYSDEL	New York State Department of Labor
OSHA	Occupational Safety and Health Administration
PDR	Personal Data Ram
PEL	permissible exposure limit
PG	Professional Geologist
PID	photo ionization detector
PM	Project Manager

POC	Point of Contact
PPE	personal protective equipment
ppm	parts per million
QAM	Quality Assurance Manual
QC	Quality Control
RCA	Radiation Control Area
RCOC(s)	Radiological Contaminant(s) of Concern
RCRA	Resource Conservation and Recovery Act
RPP	Radiation Protection Plan
RSO	Radiation Safety Officer
RSP	Radiation Safety Plan
RWP	Radiation Work Permit
SSHP	Site Safety and Health Plan
SRSL	Site Radiation Safety Lead
SRSO	Site Radiation Safety Officer
SSHO	Site Safety and Health Officer
SSHP	Site Safety and Health Plan
TLV	threshold limit value
TWA	time weighted average
µg/kg	microgram per kilogram
UFGS	United Facilities Guide Specification
USACE	United States Army Corps of Engineers
USGS	United States Geological Survey
VOCs	volatile organic compounds
WNV	West Nile Virus
XRF	x-ray fluorescence
YSI	Yellow Springs Instrument

1.0 BACKGROUND INFORMATION

1.1 Introduction

American Remediation Solutions and Environmental Corporation (ARSEC) has been selected by the United States Army Corps of Engineers (USACE) – Buffalo District under Contract Number W912P4-07-D-0009 D.O. 0003 to implement Phase 2 remedial investigations at the Tonawanda Landfill in Tonawanda, New York, hereafter referred to as the “Site.” The Site has been identified as possibly containing various levels of residual radioactive material in soil from previous operations, including, specifically, radium-226 (Ra-226), thorium-230 (Th-230), thorium-232 (Th-232), uranium-238 (U-238), and americium-241 (Am-241). Descriptions of the site history and the source of contamination are provided in the USACE-Buffalo District FUSRAP Site “Phase 2 Remedial Investigation RI Addendum for the Tonawanda Landfill Operable Unit” (USACE, 2009).

This Accident Prevention/Health and Safety Plan (APP/SSHP) presents safety and health procedures ARSEC personnel and subcontractors will follow in performing activities including drilling, surveying, and sampling of soils. On-site surveying and sampling activities will include walking and driving over wet and uneven soil surfaces within work areas with scan survey equipment, surface soil sampling and coring of soils. The procedures presented herein are designed to reduce the risk of exposure to physical, biological, and radiological hazards associated with the field work performed at this Site by ARSEC personnel and subcontractors. The protocols and procedures in this APP/SSHP are intended for use during all phases of field work associated with the areas identified above and applies to all ARSEC personnel as well as subcontract personnel involved in site field work. In addition, ARSEC will provide continuous health physics coverage for all on-site activities. Appendix E of this APP/SSHP is the Radiation Safety Plan (RSP) that includes provisions for this health physics coverage requirement.

On-site personnel will follow the safety and health procedures described in the APP/SSHP, be alert to the hazards associated with working on the site, and exercise reasonable caution at all times. On-site personnel will be required to read and acknowledge their understanding and agreement to abide by the requirements of the APP/SSHP by signing the APP/SSHP Acknowledgment Form included in Appendix A.

A copy of this APP/SSHP will be kept in ARSEC’s site office for easy reference. In addition to the daily tailgate safety meeting, additional safety in-briefings will be conducted on site whenever new field teams and/or visitors arrive on site. Any modifications to the Plan necessitated by changing field conditions will be explained and documented by an addendum to the Plan for acceptance by the USACE COR. This APP/SSHP will also be available for review by USACE representatives when requested. This APP/SSHP is a working document and is subject to change based on review and the implementation of additional tasks.

ARSEC is responsible solely for compliance with the provisions of the APP/SSHP by ARSEC employees and other designated personnel under the direct supervision of ARSEC management. When personnel other than ARSEC employees are present on site, ARSEC will inform them it is the responsibility of their employer to provide them with health and safety information

(including training, medical monitoring, equipment, etc.) that is in compliance with relevant regulations. Personnel other than those explicitly authorized by contract or subcontract agreement or specifically mentioned in this Plan may not use ARSEC's APP/SSHP without the permission of ARSEC.

1.2 Purpose

This APP/SSHP;

- Identifies the location and setting in which the work will be conducted,
- Describes the work which will be conducted,
- Discusses the hazards likely to be encountered during the project,
- Presents the standards and procedures that will ensure that all activities are conducted in a safe manner and will avoid accidents,
- Outlines emergency and contingency plans for the protection of on-site personnel during unusual occurrences, and,
- Designates the authorities and responsibilities for implementation of all standards and procedures.

1.3 Work Description

Work activities will consist of the following functional tasks:

Task 1 – Mobilization: Mobilization will consist of setting up the site trailer; moving equipment and instrumentation, moving project personnel and moving supplies to the Site; and conducting project-specific training for field staff.

Task 2 – Site Clearing: Site clearing will include the clearing and grubbing of all areas of the field investigative areas in accordance with the requirements of the Scope of Work. This work will be conducted to allow use of a consistent direction and speed during the gamma walkover survey and will include trimming lower tree limbs and removing foliage and trees less than 15 centimeters (6 inches) diameter, as well as other specifics defined by the USACE. Once the clearing and grubbing is complete, an ARSEC subcontractor, a local State of New York Professional Surveyor, will be tasked with conducting a civil survey to establish the baseline elevations for the site and to locate and mark the locations of USACE delineated sampling locations.

Task 3 – Gamma Walkover Survey (GWS): Single direction gamma walkover surveys will be conducted over 100% of investigative areas 1 through 6. The surveys will be performed using a MARSSIM methodology. The purpose of the surveys is to characterize the site for worker health and safety and to assist in location of surface soil contamination. The surveys will be conducted using teams equipped with a Trimble system mounted on a Polaris Ranger 700 6x6 or equivalent (PR700) in combination with back-pack Trimble unit where walking surveys are necessary.

Task 4 – Sampling of Surface and Subsurface Soils: Sampling of surface and subsurface soil at the Tonawanda Landfill OU will be conducted to confirm or update DOE's findings of elevated concentrations of radiological constituents of concern. Investigative Area drilling sampling will be performed in accordance with the USACE Scope of Work. Investigative Areas IA-1 through IA-6 are shown in Figure 8-1. The drilling subcontractor will mobilize three fully

equipped track-mounted Geoprobe unit to the Tonawanda Landfill OU site with a staff to work in a safe and coordinated fashion with ARSEC. To collect soil samples, either a Macro Core (MC) sampler or a Closed Piston Macro Core (CPMC) drive point sampler will be used. Samples will be collected from 0' to 4', 4' to 8', 8' to 12' below grade and possibly deeper depending on subsurface conditions. ARSEC Health Physics Technicians (HPTs) will scan the core with a 2" by 2" sodium iodide (NaI) detector or equivalent and a beta scintillator. The drilling operations will be continuously surveilled by an ARSEC Professional Geologist who will utilize GPS and geographic information system (GIS) equipment to record, document, and report the location of the soil borings required under the base contract. Each soil boring will also be surveyed for location and elevation by a local registered Professional Surveyor (PS). ARSEC will utilize accepted protocols for the collection of surface and subsurface soil samples. The detailed protocols and procedures will be delineated in the ARSEC SAP for the Tonawanda project.

Task 5 – (Optional) Groundwater Sampling from Temporary Wellpoints: ARSEC and its drilling subcontractor will install up to 14 temporary well points if directed by USACE. The 14 TWPs will be installed using one of the Geoprobe rigs. All TWPs will be sampled in accordance with standard low-flow technologies delineated in EPA/540/S-95-504 April 1996.

Task 6 – (Optional) Characterization, Handling and Disposal of Investigative Derived Waste: All non-indigenous IDW generated during the field sampling activities will be collected and stored in appropriate containers and stored on-site. Indigenous IDW will be returned to its source to the extent practical and safe. All IDW will be cataloged and tracked. All tracking will be documented in logbooks and those results reported in the Final Reports. Consolidated wastes stored within the IDW containers will be sampled and the samples will be submitted to the off-site laboratory for waste characterization analysis. The waste characterization analysis shall be based on the Waste Acceptance Criteria for the USACE accepted disposal facility.

1.4 Hazards Discussion

The evaluation of hazards, specifying levels of protection, and the safety procedures presented herein are based on information available at the time this Plan was prepared. The specifications described herein represent the minimum health and safety requirements to be observed by field personnel. The procedures described herein are conservative health and safety requirements to be observed by all personnel involved at the start of this project. Site conditions may warrant a reassessment of protection levels resulting in protection levels and controls that may be more or less restrictive than previously required by this APP/SSHP. Revisions to the APP/SSHP must have prior approval by the ARSEC Environmental, Safety, and Health (ES&H) Manager, ARSEC Certified Health Physicist (CHP), Site Safety and Health Officer (SSHO), Site Radiation Safety Officer (RSO), ARSEC Buffalo Health Physics (HP) Services Program Manager, and ARSEC Quality Assurance Manager (QAM).

On-site personnel will follow the safety and health procedures described in the APP/SSHP, be alert to the hazards associated with working on the site, and exercise reasonable caution at all times. On-site personnel will be required to read and acknowledge their understanding and agreement to abide by the requirements of the APP/SSHP by signing the APP/SSHP Acknowledgment Form included in Appendix A.

A controlled copy of this APP/SSHP will be kept in ARSEC's site office for easy reference. In addition to the daily tailgate safety meeting, additional safety in-briefings will be conducted on site whenever new field teams and/or visitors arrive on site. Any modifications to the Plan necessitated by changing field conditions will be explained and documented by an addendum to the Plan. This APP/SSHP will also be available for review by USACE representatives when requested. This APP/SSHP is a working document and is subject to change based on review and the implementation of additional tasks.

1.5 References

This APP/SSHP has been developed and the field activities described herein will be performed in accordance with the following documents:

- The ARSEC *Environment, Safety and Health Program Plan*, (ARSEC, 2007), a copy of which is included in electronic (Compact Disc [CD]) format as Appendix B.
- USACE Engineer Manual (EM) 385-1-1, *Safety and Health Requirements Manual*, (USACE, 2008).
- USACE EM 385-1-92, *Safety and Occupational Health, Requirements for Hazardous, Toxic and Radioactive Waste Activities*, (USACE, 2007).
- USACE EM 385-1-80, *Radiation Protection Manual*, (USACE 1997).
- USACE ER 385-1-80, *Radiation Safety*, (USACE 1997).
- U.S. Department of Labor, Occupational Safety and Health Administration (OSHA), Chapter 29, Sections 1910.120 and 1926 of the Code of Federal Regulations (29 CFR 1910.120 and 1926).
- U.S. Environmental Protection Agency (EPA), Office of Emergency and Remedial Response, Standard Operating Safety Guides (EPA, 1988).
- New York State Code Rule 38, *Ionizing Radiation Protection*, (NYSDOL)
- National Institutes of Occupational Safety and Health (NIOSH)/OSHA/U.S. Geological Survey (USGS)/EPA Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities, October 1985.
- United Facilities Guide Specification (UFGS) 01 35 29.13 Health, Safety, and Emergency Response Procedures for Contaminated Sites.
- UFGS-01 35 26 (February 2009) Government Safety Requirements

2.0 STATEMENT OF SAFETY AND HEALTH POLICY

ARSEC is dedicated to the concept that all accidents are preventable. Accordingly, ARSEC is committed to achieving and sustaining "Zero Accident Performance" through continuous improvement practices. "Zero Accident Performance" includes zero non-permitted discharges or releases with respect to protection of the environment. ARSEC views the success of the ZERO ACCIDENT PERFORMANCE POLICY as being based upon three very fundamental goals. First, management supports the "zero accident policy" from the CEO/President down through the ARSEC Corporate and Project Management Staff. This daily demonstration of commitment to Zero Accident is essential to inculcate this philosophy to all levels of the company and its project. Second, our employees are encouraged and directly involved in all elements of the work process. It has been proven that worker involvement is the most important element to ensure safe

practices. Third, management, supervisors and workers must be trained on case management regarding response, worker down time management, medical treatment options and reporting requirements. This promotes responsiveness and compliance with applicable rules and regulations.

2.1 Project Safety Goal

Safety is ARSEC's highest priority. ARSEC has established a goal of zero accidents for this project. The process of planning the project work is done in order to identify, evaluate, and control the site hazards and to help realize the goal of zero accidents.

2.2 Safety Promotions

The following methods for promoting accident prevention will be enacted:

- Accident prevention will be a regular topic discussed at the morning plan of the day.
- Accident prevention videos will be shown as needed at safety meetings or as site safety conditions warrant.

3.0 RESPONSIBILITIES AND LINES OF AUTHORITIES

ARSEC is ultimately responsible for the implementation of the SOH program. ARSEC is responsible solely for compliance with the provisions of the APP/SSHP by ARSEC employees and other designated personnel under the direct supervision of ARSEC management.

When personnel other than ARSEC employees are present on site, ARSEC will inform them it is the responsibility of their employer to provide them with health and safety information (including training, medical monitoring, equipment, etc.) that is in compliance with relevant regulations. Personnel other than those explicitly authorized by contract or subcontract agreement or specifically mentioned in this Plan may not use ARSEC's APP/SSHP without the permission of ARSEC.

3.1 Responsible Personnel

Although no changes are currently foreseen, it may be necessary during the project to modify some elements of ARSEC's project organization, such as personnel, responsibilities, and lines of authorities, so that individual tasks can be performed safely and efficiently. Any changes to the overall ARSEC project organization will be revised in the appropriate sections of this APP/SSHP. Any such changes that become necessary will be communicated to USACE in advance of their implementation.

Figure 2-1 shows the organizational structure of the ARSEC project team and lines of authority illustrating each personnel's accountability. Resumes of industrial hygiene and safety personnel are provided in Appendix G. Emergency response contact information and directions to the nearest hospital are provided in Appendix C.

3.1.1 USACE Project Personnel

USACE personnel hold overall management responsibility for the entire project. USACE Buffalo District's Project Manager will be the primary point of contact (POC) with the site property owners, EPA, and the New York State Department of Environmental Conservation (NYSDEC). The USACE Contracting Officer (CO) and/or their designated, in writing, representative (Appointed Contracting Officer Representative (COR)) will be responsible for providing direction and decisions concerning technical issues and strategies, setting the basic policies in accordance with work assignments, and conducting quality assurance oversight.

3.1.2 Program/Project Manager

The ARSEC Project Manager (PM) for this effort will be R. Steven Shirley. He is responsible for evaluating the appropriateness and adequacy of the technical services provided for the project, and for developing the technical approaches and level of effort required to address each task. He is also responsible for the overall conduct of work, including integration of input from supporting disciplines, USACE and subcontractors. He will work closely with the ARSEC Site Superintendent/Contractor Quality Control Manager (CQCM) during implementation of the field program. Specific responsibilities include:

- Initiating project planning and directing project activities;
- Ensuring that qualified technical personnel are assigned to various tasks, including subcontractors;
- Identifying and fulfilling equipment and other resource requirements;
- Monitoring project activities to ensure compliance with established scopes, schedules and budgets;
- Ensuring overall technical quality and consistency of all project activities and deliverables; and
- Serving as the primary ARSEC POC with the USACE.

ARSEC's PM, CQCM, Site Safety and Health Officer (SSHO) and CHP have overall responsibility for ensuring that all ARSEC Site activities are performed in accordance with USACE, EPA, and NYSDEC requirements, as well as this APP/SSHP and other project work plans.

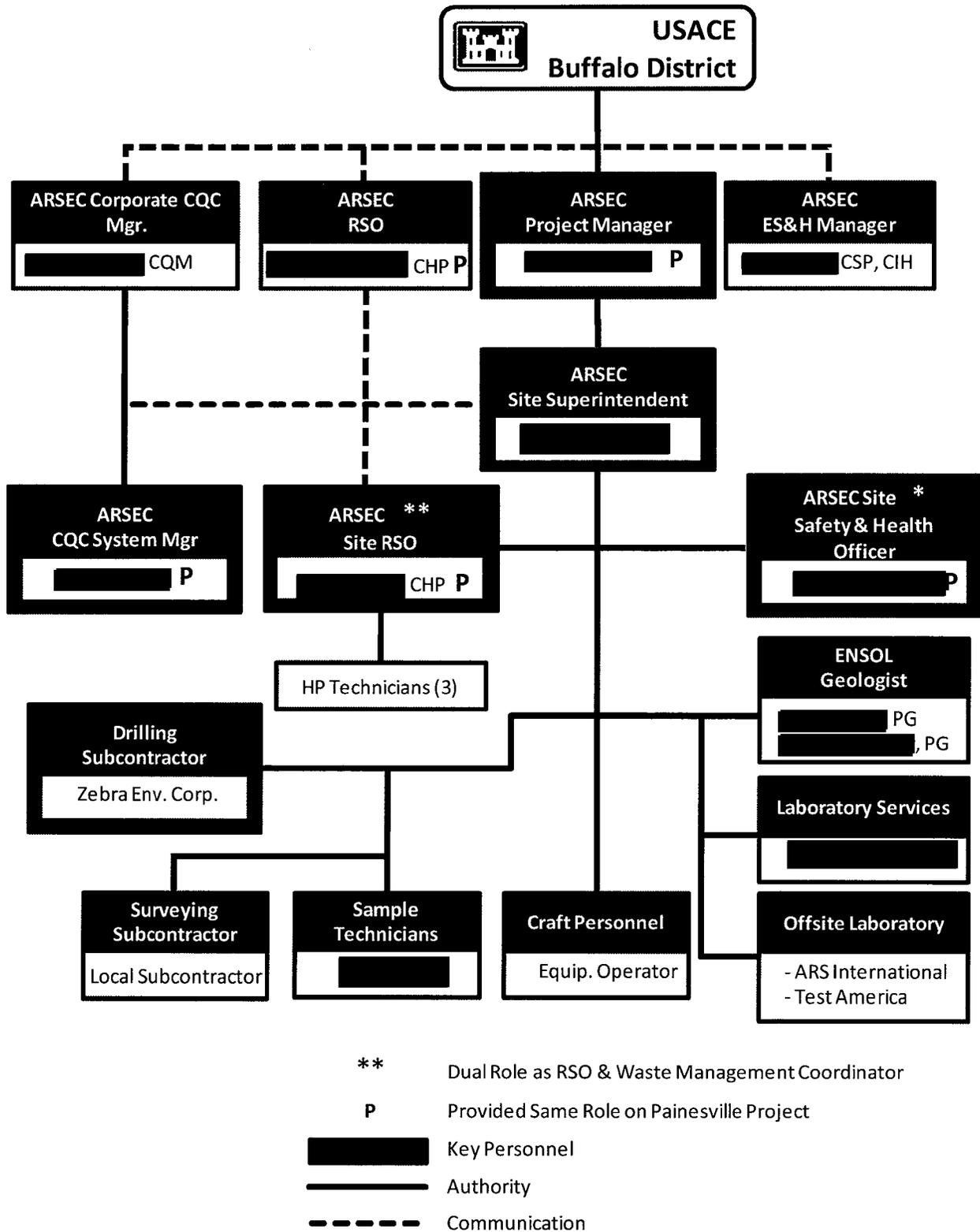


Figure 3-1. ARSEC Tonawanda Landfill Project Team Organizational Structure

3.1.3 ARSEC ES&H Manager

The ARSEC ES&H Manager, [REDACTED] (PE, CIH, CSP), is responsible for ARSEC's overall health and safety program. His duties in that capacity include development of the ARSEC ES&H program, plans, and procedures; providing/coordinating health and safety training; review and approval of project/site-specific APP/SSHP and revisions thereof; working with the PM and CQCM to ensure sufficient resources are planned and provided to implement the APP/SSHP; serving as an internal safety and industrial hygiene consultant and resource to the project team (PM, CQCM, SSHO); and performing audits to verify proper implementation of the approved APP/SSHP. Mr. Peters resume is provided in Appendix G.

3.1.4 ARSEC RSO

[REDACTED] is a CHP and is the ARSEC Corporate Radiation Safety Officer (RSO). In this capacity, he is responsible for oversight and review of all ARSEC radiological activities and data. [REDACTED] is responsible for reviewing radiological data deliverables from analytical laboratories, interfacing with the laboratory client services coordinators and coordinating the resolution of laboratory problems. The Corporate RSO has the authority to direct such activities, stop work (and restart based on consultation with the PM) and to take appropriate actions, as required, to address radiological emergency situations. He will work directly with ARSEC onsite staff to ensure that ARSEC radiation safety and survey plans/procedures including APP/SSHP are properly implemented and followed.

3.1.5 ARSEC Corporate Quality Control Manager (CQCM)

The ARSEC CQCM is responsible for the quality of ARSEC's work. The ARSEC CQCM, [REDACTED] will be responsible for assuring the project team implements the policies and procedures required under the USACE contract and assuring that corrective action is taken if performance does not meet internal or USACE quality requirements. He will work closely with the PM, CQCM, and Independent Technical Reviewers to ensure established protocols and procedures are implemented, the work performed in accordance with the USACE Statement of Work, ARSEC SOPs, and other supporting work plans.

The ARSEC CQCM is responsible for directing planning, implementing and tracking quality control (QC) activities and maintaining internal communication on QC matters. He, or a designee, may conduct periodic Site and project audits as part of this process. He may conduct periodic audits of on-site procedures, including safety procedures. The duties also include QC task staffing and ensuring that QC data evaluation, data verification, and reporting procedures are followed. The ultimate goal of these activities is to perform work and produce data that satisfy the project objectives as defined in the project work scope.

3.1.6 Site Superintendent (SS)

The Site Superintendent for the Tonawanda Landfill Project, [REDACTED] [REDACTED], reports directly to the PM and is responsible for the overall direction and management of field project tasks associated with completing the work at the Site. [REDACTED] has over 20 years of experience

working in the areas of radioactive site characterization, remediation, and monitoring, including the design and implementation of soil sampling and survey programs. [REDACTED] will provide daily oversight of field staff and subcontractors and ensure that procedures for field activities are executed in the proper manner, activities are properly documented, the prescribed SOW is completed, and communication protocols are followed.

3.1.7 Site RSO (SRSO)

The Site RSO for the Project is [REDACTED]. [REDACTED] is a CHP, possesses a B.S. in General Science and is registered by the National Registry of Radiation Protection Technologists (NRRPT). Through his educational background, experience, certifications, [REDACTED] meets and/or exceeds the qualification requirements as outlined in USACE *Health and Safety Requirements Manual*, EM-385-1-1, which includes but is not limited to formal and hands-on training in radiation protection and knowledge of radiation physics, use of monitoring instruments, and knowledge of applicable regulations.

As the ARSEC SRSO, he shall be responsible for ensuring that radiation health and safety procedures designed to protect the public, environment, and field personnel are maintained throughout the project. The ARSEC RSO will coordinate the establishment of radiologically-controlled areas, monitoring radiation exposure levels, inspecting all material/equipment entering or leaving Radiation Control Areas for compliance with the RPP and other applicable requirements, and issuance of Radiation Work Permits (RWPs). The ARSEC SRSO is also responsible for overseeing the maintenance and quality control check of the on-site radiological instruments and will provide instrument data records to the CQCSM for storage in on-site files.

[REDACTED], who reports directly to the Corporate RSO and coordinates with the SSHO and PM, has the following project responsibilities:

- Support the SSHO in the on-site implementation of the APP/SSHP and ensure that all project personnel follow the radiological requirements of the APP/SSHP;
- Assist the SSHO in the daily tailgate safety meetings and report any incidents that occur on-site to the Corporate RSO;
- Develop and maintain the RWP procedures for applicable areas of the Site;
- Note changes in site conditions or procedures and suggest revisions to the APP/SSHP and site procedures as necessary to ensure adequate safety precautions are in place;
- Acquire and implement input from the Corporate RSO, as necessary, to maintain the site radiological safety program;
- Coordinate the on-site administration of the personnel exposure monitoring procedures for onsite personnel;
- Ensure compliance with all applicable regulations concerning the handling of radioactive material;
- Provide/ensure that ARSEC general radiation worker and site specific radiation training is provided to all onsite personnel who enter Radiological Controlled Areas;
- Responsible for control and use of licensed and non-licensed ionizing radiation sources utilized for daily QC of radiation detection systems; and
- Provide point of contact for onsite radiation regulatory interfaces.

3.1.8 Site Safety and Health Officer

The ARSEC SSHO for the Tonawanda Landfill Project, [REDACTED], reports directly to the ARSEC ES&H Manager. The SSHO communicates and coordinates with the PM and CQCM Manager. The SSHO is responsible for ensuring ARSEC site personnel and subcontractors have the proper training, safety-related licenses, and are medically-qualified to perform the work. The SSHO works with the CQCM in performing daily health and safety briefings to site personnel in the field; coordinates additional site-specific safety training with the ARSEC ES&H Manager and PM; works with the PM and CQCM to ensure sufficient safety-related equipment, instruments, Personal Protective Equipment (PPE) and other materials are available to support safe surveying and sampling operations; leads field safety-related monitoring activities; and verifies the APP/SSHP is followed. The SSHO is a focal point, along with the CQCM for safety-related communications with field personnel and answering safety-related questions for field personnel. The SSHO is an OSHA competent person* who has authority to issue stop work orders on-site tasks that he believes may be unsafe. When stopped, work will not recommence until the ARSEC ES&H Manager, Corporate RSO, and PM approve the restart.

The SSHO is also responsible for maintaining personnel training certificates, medical monitoring files (as needed), and preparing accident investigation forms (USACE Form ENG 3394) in accordance with the accident avoidance and reporting procedures of the Site Safety and Health Plan (SSHP). [REDACTED] resume is provided in Appendix G.

*No work shall be performed on the Site unless an OSHA Competent Person is present.

3.1.9 Other Field Personnel

Other field team members are responsible for performing field activities as stipulated in this plan and will report directly to the CQCM. The field team members and responsibilities will consist of the following, in addition to the personnel listed above:

- Sampling Technician(s) – ARSEC Sampling Technicians will be responsible for the collection of samples in accordance with the approved Field Sampling Plan and for the coordination of analysis of the collected samples via the off-site laboratory. The ARSEC Sampling Technicians will report to the CQCM via a Lead Sampling Technician.
- Health Physics (HP) Technician(s) – HP Technician(s) will perform periodic instrument checks, radiological surveys, in accordance with the approved Field Sampling Plan and will conduct all surveys and monitoring necessary for health physics coverage during all ARSEC site activities in accordance with the RSP. The HP Technician(s) will also maintain ARSEC radiological work zones and controls, perform surveys of personnel and equipment, and complete instrument and data records with oversight by the ARSEC RSO/Site Radiation Safety Lead (SRSL). The ARSEC HP Technician(s) will be responsible for Site boundary air monitoring and the coordination of the ARSEC dosimetry program.

Each person assigned work on the Site is ultimately responsible for their health and safety while working on this project. Primary safety responsibilities of each person working on the Site includes taking all reasonable precautions to prevent injury to themselves and to their fellow site workers and being alert to potentially harmful situations. Field personnel are responsible for:

- Performing only tasks that they can do safely and in which they have been trained;
- Notifying the ARSEC SSHO of special medical conditions (i.e., allergies, contact lenses, etc.);
- Notifying the ARSEC SSHO of prescription and/or non-prescription medication the worker may be taking that might cause drowsiness, anxiety or other unfavorable effects;
- Practicing good housekeeping by keeping the work area neat, clean, and orderly;
- Immediately reporting all injuries to the ARSEC SSHO;
- Complying with the APP/SSHP and all health and safety recommendations and precautions, properly using the PPE as determined by this APP/SSHP and/or the SSHO; and
- Stop work and immediately notify the SSHO if conditions arise or are observed that are believed to be an imminent hazard.

3.1.10 Lines of Authority

ARSEC employees are expected to accept personal responsibility and concern for the health and safety of themselves, fellow workers, subcontractors, and visitors through the knowledge of, and compliance with, Company programs and policies, attending training programs, and abiding by established rules and procedures.

ARSEC is not tolerant of any employee who modifies or alters any equipment or procedures, or performs work which is inconsistent with the manufacturer's instructions and/or established operating site-specific safety and health plan or procedures. In addition, any employee who fails to follow established safety and health procedures will be subject to disciplinary action in accordance with ARSEC's Corporate policy. Questions or violations should be reported to the SEC Project Manager (PM), or Site Health and Safety Officer (SHSO) for follow-up.

In order to ensure continued commitment to health and safety policies, SEC has set certain subcontractor safety and health goals, objectives and performance indicators. These must include the following safety and health goals as a minimum:

- A. No fatalities;
- B. Minimal lost time injuries/illness;
- C. No property damage or fire loss;
- D. No crane, rigging or other heavy equipment accidents;
- E. OSHA total recordable cases rate as listed respectively (i.e., Total Recordable Cases, 5.7; Lost Work Cases, 2.3; Severity Rate 28.0); and
- F. No unprotected exposures to hazardous materials above any listed permissible exposure limit.

4.0 SUBCONTRACTORS AND SUPPLIERS

ARSEC has selected Zebra Environmental Corporation of Niagara Fall, New York as our drilling subcontractor. Additional subcontractor services, yet to be determined, will be procured for civil

survey work and other services as needed. ARSEC subcontractors and suppliers are responsible for compliance with the provisions of the APP/SSHP by their employees.

5.0 TRAINING REQUIREMENTS

5.1 Site-Specific Safety and Health Training/New Hire Pre-Entry Briefing

Site-specific health and safety training will be conducted prior to field activities. The designated SSHO and/or RSO will review the APP/SSHP, project plans, and other associated responsibilities with the field personnel, including subcontractors, and afford them the opportunity to ask questions. A record of this training will be maintained by the SSHO. Both ARSEC and subcontractor personnel are required to attend a safety orientation meeting prior to working onsite. These orientation meetings are documented and kept on file. ARSEC will ensure that Visitor Radiation Safety Training is provided and documented prior to the visitor's entry into these areas.

5.2 Basic HAZWOPER Training

Site personnel conducting and directing final status surveying, sampling, and/or boundary monitoring will have completed a 40-hour HAZWOPER training course and three days of documented field experience under the direct supervision of a trained experienced supervisor in accordance with 29 CFR 1910.120(e). All workers entering the exclusion and/or controlled area shall be up-to-date on medical monitoring. On-site management personnel (the CQCM or SSHO) will also have an additional eight hours of HAZWOPER supervisory training.

All site personnel conducting and directing sampling, surveying and/or monitoring will have completed an annual (eight hour) refresher if initial 40-hour training is over one year old. Copies of training certificates will be kept in project files maintained on site by the SSHO and will be made available for review by USACE.

Personnel without current HAZWOPER training may gain access to the administrative portions of the Site (e.g., field trailer, Support Zones) but may not enter active work zones or RCAs, as defined in the APP/SSHP.

5.3 Periodic Safety and Health Training for Supervisors and Employees

All personnel assigned to or regularly entering the Site will have received the required mandatory minimum hazardous waste site training required in 29 CFR 1910.120(e). Other specific training will be implemented as required by applicable sections of 29 CFR 1910 and 1926 will be performed prior to commencement of the applicable project work activities. Periodic training will be conducted for workers as deemed necessary for specific task or changing work conditions. Specifics of radiation worker training are discussed in the Radiation Safety Plan (Appendix E).

5.4 Emergency Response Training

All personnel will be trained in basic site emergency notification and response procedures. SEC personnel will participate in emergency response and emergency drills. ARSEC Employees and its sub-tier Subcontractors are to be trained, as applicable, in Project Specific Emergency Response Evacuation Plans.

5.5 CPR and First Aid Training

ARSEC on-site workers will have current certification in first aid and cardio pulmonary resuscitation (CPR). The training will be equivalent to that provided by the American Red Cross. These individuals will be on site at all times while active field mobilization, surveys/sampling, and site restoration are in progress.

5.6 Blood Borne Pathogen Training

Individuals who have received First Aid and/or CPR certification and who may need to provide emergency service to an injured/unconscious co-worker will have received awareness level training in controlling exposures to blood borne pathogens (BBP). This training will consist of the following:

- Review of the BBP standards;
- Description of the risks of exposure and how BBP are transmitted;
- Methods of protection against exposure and procedures for decontamination; and
- Post-exposure procedures.

5.7 Hearing Conservation Training

Use of hearing protection is mandatory whenever powered equipment or other devices are used which produce sound levels over 85 decibels (dBA) for individuals with documented threshold shifts. Powered equipment generally will produce sound levels greater than 85 dBA. Hearing protection will be required for personnel working in the immediate area of all heavy equipment (sonic drill, excavator, hydraulic breaker, cutting torches, loader, dozer, pumps, and generators) operation on this project.

5.8 Respiratory Protection Training

The ARSEC SSO, ARSEC Corporate RSO, and ARSEC ES&H Manager will determine when respiratory protection is required. Site personnel required to use respiratory protection devices will have received equipment-specific training and satisfactorily completed a qualitative fit test for the model to be worn, in accordance with 29 CFR 1910.134. This training covers the use, limitations, inspection, maintenance, and cleaning of respiratory protection devices required for use under the conditions of this SSHP. All site remediation personnel will also have an up-to-date medical clearance to qualify for work requiring respiratory protection.

5.9 PPE Training

PPE will be provided, used, and maintained in a sanitary and reliable condition on site in accordance with 29 CFR 1910, Subpart I. All PPE will be of design, construction, and materials suitable to protect workers against known or anticipated hazards. PPE will be selected which properly and appropriately fits the employee. Site personnel will be provided with training on the selection, use, and limitations of PPE in accordance with the above-referenced standard. Any concerns regarding the use of appropriate PPE will be brought to the attention of the SSHO or ARSEC ES&H Manager. The SSHO is responsible for ensuring that sufficient quantities of appropriate PPE are available on site.

5.10 Confined Space Entry Training

If site remediation workers are potentially involved with confined space entry on this project, they will have received confined space entry training in accordance with the requirement outlined in ARSEC's Confined Space Entry Safety Procedure which can be found in the *ARSEC Corporate Health and Safety Manual*, included as Appendix B of this document.

5.11 Fall Protection Training

ARSEC personnel that could potentially be exposed to fall hazards will receive training in accordance with 29 CFR 1926.503.

5.12 Drill Rig Training

All members of the drill crew must receive site-specific training prior to beginning work and must provide the appropriate documents and training certificates that are required of all site workers, such as, 40-hr. Hazardous Waste Operations and Emergency Response (HAZWOPER) training certificate, medical monitoring reports, operator's qualifications, etc. The drilling subcontractor in charge must also provide the necessary proof of compliance with any specific regulation of the State of New York regarding the training and qualifications of drillers.

5.13 PPE Training

Site-specific training will include information concerning use, proper fit, donning, doffing, and the limitations of the protective garments. In addition, as part of physical hazards, the temperature extremes as associated with PPE will be discussed.

The SSHO, in consultation with the CQCM, the ARSEC SRSO, and the ARSEC ES&H Manager, has the responsibility and authority to upgrade and/or downgrade PPE in response to changes in field conditions by the revision of AHAs and issuance of task-specific work permits (e.g., Radiation Work Permit, Hot Work Permits, Confined Space Entry Permits, etc.). Conditions that may warrant changes in PPE may include, but are not limited to, discovery of buried chemicals or unanticipated radiological materials.

5.14 Daily Safety Meetings

The CQCM and/or the SSHO will conduct daily tailgate safety meetings to review the day's work plan and associated activities, discuss anticipated hazards, PPE, and mitigating measures. The SSHO will maintain documentation of the names of personnel attending the daily tailgate safety meetings and discussion topics in the on-site project files.

5.15 Record Keeping

Each site worker is responsible for providing the following information identified below to the SSHO for record-keeping. These records will become a part of the project file.

- Statement of APP/SSHP Acknowledgment (see Appendix A);
- 40-hr HAZWOPER training certificates and current eight-hr refresher;
- Fit-for-duty medical approval and clearance for use of respiratory protection; and
- Documentation of site-specific training identified in Section 4.1.

The following records or logs will also be incorporated into the project file:

- Accident Investigation Reports: A written accident report form will be completed by the SSHO and forwarded to the Corporate Health and Safety Manager, PM, and USACE within 24 hours of any on-site accidents or worker injury.
- Revisions to the SSHP: The SSHO, in consultation with the ARSEC ES&H Manager, PM, and the USACE, will document recommended changes to the SSHP. Revisions approved by the SSHO will be made part of the SSHP and will be distributed to all essential personnel.

6.0 SAFETY AND HEALTH INSPECTIONS

6.1 Work Tasks

All work activities will be inspected by the SSHO and SS on a daily basis. The SSHO has the responsibility for conducting routine formal job site inspections to ensure compliance with the safety program. The safety inspections will be conducted to identify non-compliance items including unsafe equipment/tools; unsafe conditions (hazardous materials, atmospheric, etc.); and unsafe acts (violation of standard operating procedures - SOP's). These inspections shall generally include immediate work areas and equipment/materials storage or staging areas (inclusive of vehicles, toolboxes, and storage trailers).

6.2 Equipment and Tool Inspections

Prior to initial entry to the project site, all equipment will be inspected for safety conformance to include proper operation and functioning. The SSHO or designee is responsible for the initial inspection to be outside the site boundary. Equipment will not be available for use until satisfactory inspection and checkout has been completed. Defective or otherwise unsafe equipment or tools will be tagged "DO NOT USE". Items tagged "DO NOT USE" will be repaired and made acceptable or will be removed from the site. Repaired items will be re-

inspected prior to entering the site. Hoisting/rigging equipment or other equipment that cannot be repaired will be destroyed or otherwise made inoperable to prevent inadvertent use by others at another project.

6.3 Preoccupancy Safety Inspections

SEC's SSHO or designee will perform safety inspections of ARSEC's temporary facilities prior to taking occupancy.

6.4 Additional Inspections

Additional inspections (e.g., heavy equipment) may be required to be inspected by operators of the equipment. Daily inspections will be documented. Deficiencies will be noted on appropriate inspection forms in accordance with applicable procedure, tracked, and corrective actions taken. All inspection documentation will be submitted to the SSHO, and kept on file in the ARSEC field office.

6.5 Hazard Identification Commitment

ARSEC empowers its employees to adhere to all S&H requirements. ARSEC Corporate Management ensures that all ARSEC employees and subcontractors have the right and obligation to report unsafe conditions and to interrupt or stop work without fear of reprisal. No ARSEC employee or subcontractor will be asked to complete a task that an employee feels is unsafe or that may endanger the environment.

7.0 ACCIDENT REPORTING

The SSHO is responsible for documenting man-hours worked and preparing accident investigation forms (USACE Form ENG 3394) in accordance with the accident avoidance and reporting procedures of this APP/SSHP. All accidents occurring incidentally to the project shall be investigated, reported, and analyzed. All ARSEC employees are responsible for reporting all injuries or occupationally related illnesses as soon as possible to his/her immediate supervisor. ARSEC supervisors are responsible for reporting all injuries as soon as reasonably possible but no later than 24 hours. No supervisor may decline to accept a report of injury from a subordinate.

An accident that has, or appears to have, any of the consequences listed below shall be immediately reported to the USACE.

- Fatal injury/illness;
- Permanent totally disabling injury/illness;
- Permanent partial disabling injury/illness;
- Three or more persons hospitalized as inpatients as a result of a single occurrence or;
- \$200,000 or greater accidental property damage or damage in an amount specified by USACE in current accident reporting regulations

8.0 PROJECT PLANS, PROGRAMS AND PROCEDURES

Based on a risk assessment of the project activities and on mandatory OSHA compliance programs, ARSEC addresses the following applicable occupational risks and compliance plans. ARSEC's strategy for implementing our safety philosophy is through the use of established programs, policies and procedures. These programs, policies, and procedures meet all objectives for tailoring requirements to accomplish specific work at specific facilities. All site workers are required to read the applicable policies and procedures and sign appropriate acknowledgement.

8.1 Site Layout and Access

All excavation activities performed in Radiological Control Areas will be performed using radiation work permits (see Appendix E). As the primary site concern for the work performed under the ARSEC contract with the Buffalo District is radiological, site control, access, and work zones are discussed in various sections of this document.

8.1.1 General Site Access

Site access during project activities will be through the main gate on East Park Drive (see Figure 8-1). ARSEC will have primary control and responsibility for Site access during investigation activities. This control will be coordinated with the USACE and property owners prior to mobilization. Site access control will include:

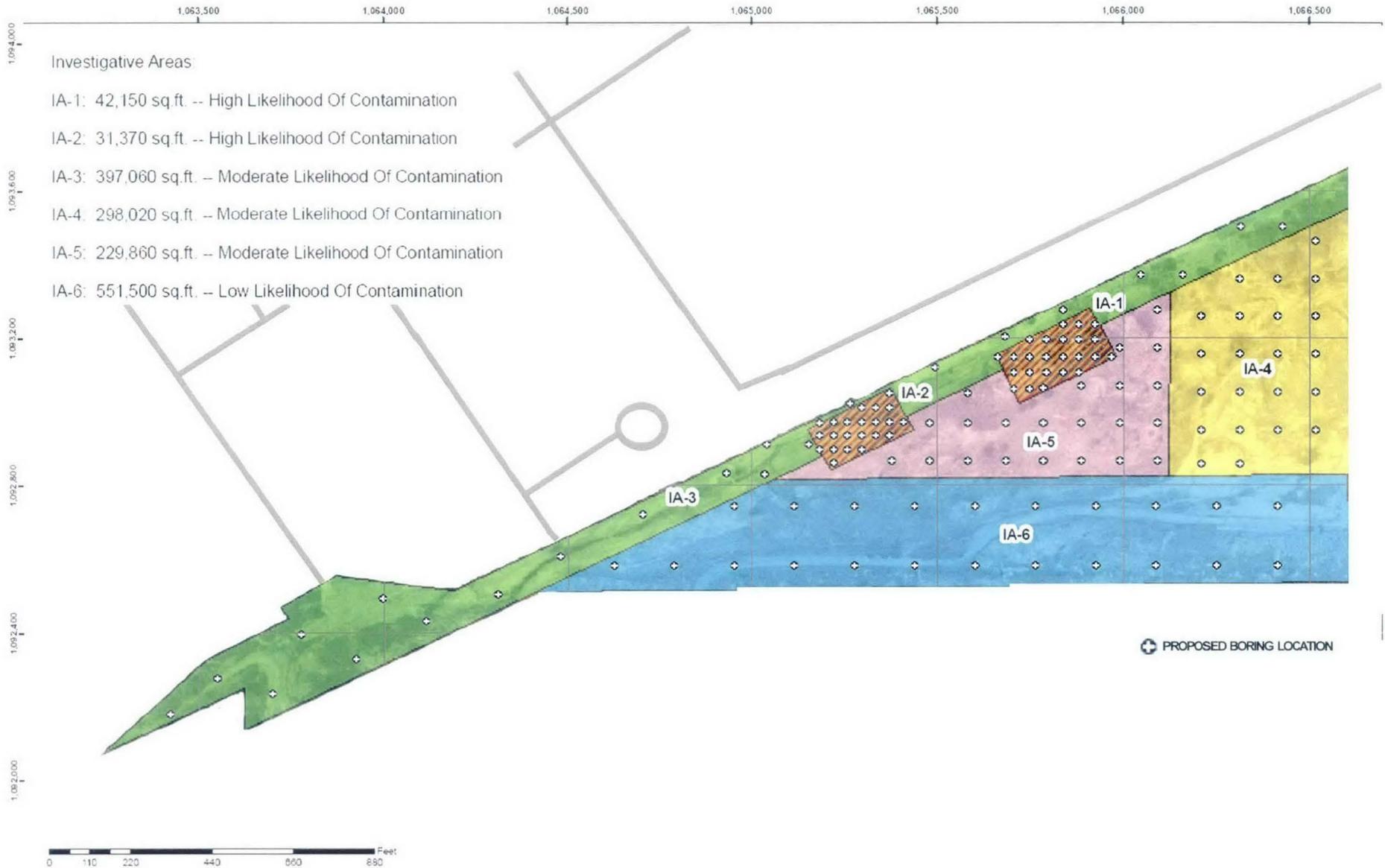
- Allowing only authorized personnel to enter Site areas while the work is being performed;
- Ensuring that the site physical barriers (such as the fences, gates, and locks) are maintained;
- Proper posting of the site and individual work areas;
- Implementing sign-in and sign-out protocols for personnel moving on and off site; and
- Ensuring that personnel are properly trained and qualified to be onsite or in specific work areas.

Evaluations of general site access and controls will be coordinated between ARSEC, USACE, and the property owners.

8.1.2 Site Visitor Access

All visitors will be required to notify the Site Superintendent or SSHO upon their arrival at the Site. Once on site, all visitors are required to first report to the field trailer and sign the site entry and exit log. All visitors will receive a brief site safety briefing by the SSHO or his designee on their first visit. Access to the Site is contingent on the training requirements summarized in Section 4.0. However, site visitors may be granted access to Support Zones and Contamination Reduction Zones (CRZs) without the requisite training if escorted by the ARSEC SSHO or SRSO.

Figure 8-1. Tonawanda Landfill Investigative Areas



A daily sign-in/sign-out log will be kept in the field trailer for Site accountability purposes. The SSHO will oversee accountability of all personnel listed as present prior to evacuation in the event of a site emergency. The Site field trailer will serve as the rally point for accountability purposes.

8.2 Respiratory Protection

8.2.1 Respirator Selection

The SSHO, SRSO, or designee will determine respiratory protection based on the following criteria:

- The estimated contaminant concentration is in the range requiring respiratory protection, as determined by industrial hygiene monitoring information.
- The Derived Air Concentration (DAC), permissible exposure limit (PEL), threshold limit value (TLV), short-term exposure limit (STEL), or ceiling value for the contaminant(s) of concern may be exceeded.

8.2.2 Respirator Fit Testing

Each individual who must wear a respirator shall be required to be clean-shaven in the sealing areas of the respirator face piece. Each respirator user will be respirator fit tested using qualitative testing at least annually.

8.2.3 Respirator Assignment

Respirators will be assigned on an individual basis. Respirators should be marked with the employee's name or identification number, if the respirator is to be reused by the same employee.

8.2.4 Respirator Cleaning, Inspection, Maintenance, Sanitization, and Storage

Respirators and supplied-air equipment that is used either occasionally or daily shall be:

- Cleaned,
- Sanitized,
- Inspected,
- Assembled, and
- Maintained ready for use.

As applicable, each respirator shall be sanitized and stored in a clean and sanitary container. Parts that require inspection include the:

- Valves,
- Valve covers,
- Nosepieces,
- Straps,
- Eyepieces, the
- Face piece and its snaps,
- Cylinders, and
- Canisters.

An individual, trained in the proper methods and procedures, is individually responsible for the:

- Cleaning,
- Inspection,
- Maintenance,
- Sanitization, and
- Storage of:
 - Respirators and
 - Supplied-air equipment

Each respirator user shall generally store his/her respirator in a clean, sealed plastic bag when not in use, unless it has been determined that the respirator and/or supplied-air equipment is contaminated, or is returned at the end of its use. If a respirator and/or supplied-air equipment becomes contaminated, it will be replaced with a clean and sanitized respirator and/or supplied-air equipment. The respirator wearer will inspect it for defective parts and leaks.

8.3 Emergency Response

The SSHO also has the responsibility for the training of all onsite personnel with regard to the emergency response procedures dealing with fire, medical situations, and assembly points.

The SSHO shall halt site operations, if necessary, in the event of an emergency or to a correct imminent danger unsafe work practices. The SSHO may require testing response capabilities of the workers via assembly drills, etc.

If an emergency (e.g., medical, fire, spill, etc) arises during the performance of this project, immediate notification shall be made by the SSHO or designee requesting the appropriate onsite response per USACE policies/procedures. If notification is made the following information at a minimum should be provided:

- Name of the person calling
- The nature and type of emergency
- Exact location of the emergency
- Location and number from where the call is being made

If the SSHO determines that local emergency responders are required for an emergency, the SSHO or designee shall call the appropriate local agency and notify the USACE COR after the telephone call has been made.

The telephone numbers for emergency response and key project personnel are listed in Appendix C. The list shall be posted and maintained by the SHSO onsite at the project trailer. The SHSO shall maintain a list of emergency notification numbers on his/her person while on site.

8.4 Spill Notification

If unidentified or unanticipated substances are released during activities, SEC will cease operations. Regarding spill notification for hazardous materials, the access control monitor and SS will be immediately notified of the following information:

- Materials involved,
- Estimated quantity,
- Location,
- Affected personnel, and
- Other hazardous conditions

An effort to contain the spill will be made, as applicable, and response measures will be implemented provided that no unprotected exposures occur. A telephone call list will be maintained at the access control point for spill notifications to USACE.

8.5 Medical Support, First Aid and Medical Facilities

The ARSEC SSHO for the Tonawanda Landfill Project, Randy McCrone, and the Site RSO, Mark Krohn are trained in first aid and CPR. In the event of an accident involving personal injury or illness, minor first aid treatment should be administered at the site.

ARSEC will maintain the capability to make emergency calls to designated ambulance services at all times. In some circumstances at project level, an injured person will be taken to the designated medical facility, Kenmore Mercy Hospital. However, the medical provider may determine that another medical facility may be better suited to treat the individual based on the nature of the injury or illness. Emergency contacts telephone numbers, directions from the Site to Kenmore Mercy Hospital and a route map are provided in Appendix C.

The following addresses first aid and medical facilities:

- First aid kits are located and maintained in the site office trailers. There will be a first aid kit available in project-owned vehicles.
- Emergency phone numbers will be posted at all SEC controlled telephones and will be available in site vehicles.
- The route to the nearest Medical Center is posted in the site office trailer.
- Emergency medical service will be dispatched via the 911 system.
- At a minimum, the SSHO and SS will be certified in First Aid and Cardiopulmonary Resuscitation (CPR).

In the event personal decontamination of injured personnel is necessary, HP technician will perform decontamination only for minor injury situations. In the event a serious injury requiring off-site medical attention occurs and the injured is contaminated, HP staff will escort the injured person to the medical facility.

8.6 Prevention of Alcohol and Drug Abuse

While on duty, ARSEC employees and subcontractors shall not use or be under the influence of alcohol, narcotics, intoxicants, or similar mind-altering substances. Personnel found to be under the influence of or consuming such substances will be immediately removed from the Site.

ARSEC management and field supervisors shall enforce the drug-free workplace requirements. Any ARSEC employee or subcontractor under a physician's treatment and taking prescribed narcotics or any medication that may prevent him/her being ready, willing and able to safely perform position duties shall provide a medical clearance statement to his supervisor.

8.7 Sanitation

The following provisions will be made to address sanitation:

- Portable toilets will be provided as necessary at locations around project areas. Arrangements will be made for the routine servicing and cleaning of these units.
- Potable drinking water is provided at the site office trailer and provisions will be made as necessary to provide potable drinking water at individual field locations. Disposable sanitary cups will be provided along with receptacles for their disposal. Bottled water for individual consumption may be used.
- Permanent washing facilities are provided in the site office area trailer. Portable washing facilities will be provided as necessary at individual field locations.

9.0 HEALTH HAZARD IDENTIFICATION AND CONTROL

9.1 Health Hazard Identification

An assigned team of project personnel shall conduct an investigation (Activity Hazards Analysis, or AHA) to identify all potential hazards prior to the start of project activities or tasks. The assigned team should consist of the Project Manager, SS, SRSO, and SSHO and other personnel from the project work categories applicable to the task order. The team shall examine available Site radiological and chemical data, facility industrial hazards; interview people with knowledge of the area or process; and, when possible, perform site walk-downs to identify possible hazards. If the information is not sufficient to adequately identify the hazards, ARSEC may perform limited sampling and characterization as necessary.

The development, approval, and use of AHAs and this plan by all project employees is one vehicle used to communicate the hazards and the requirements through line management to the workers. Other essential methods of communicating the hazards to the worker; e.g., Material Safety Data Sheets (MSDS), etc., will be utilized.

9.2 Health Hazard Controls

The final step is to implement the selected controls. The tools to be used for implementing the selected controls include the following. Workers at all levels will be involved to ensure:

- Eliminating hazards through substitution of materials or implementation of engineering controls
- Adhering to project plans, task work plans, AHAs, work permits, procedures, work instructions, etc.
- Implementing design changes
- Posting of signs, markings and other postings as necessary
- Conducting applicable personnel training
- Emphasizing individual ownership and responsibility for safety through Line Management
- Providing worker authority for stopping work based on non-compliance to safety requirements

Hazardous work will be scheduled so employees do not work alone. Each worker will maintain visual contact with another designated co-worker. The “buddy system” will ensure against an employee becoming injured without a co-worker being aware of his or her condition. The SSHO will have a cellular telephone and will be responsible for coordination for emergencies that may arise. Individuals will have readily available means of contact (cellular phone or radios) with the SSHO.

General safe work practices that will be followed by site personnel include, but are not limited to:

- Eating, drinking, chewing gum or tobacco, applying cosmetics and smoking are prohibited in work zones and in counting areas where samples are handled and surveyed;
- Sitting or kneeling in areas of obvious contamination is prohibited;
- Hands and faces will be thoroughly washed upon leaving the work area;
- Immediately repairing or replacing defective PPE;
- If respirators are required, facial hair that interferes with the face-to-face piece sealing surface of the respirator or with valve function will not be permitted; and
- Personnel on site will use the buddy system; visual contact will be maintained between team members.

Vehicular traffic in the work areas is expected to consist of heavy drilling, motorized survey equipment and work support vehicles. Site personnel should always be aware of the location and direction of operation of equipment. All personnel working in drilling areas as well as access roads will be required to wear reflective vests to help make them more visible to equipment and vehicle operators. Personnel in support areas such as trailer locations, as well as personnel in vehicles arriving and leaving the site will be reminded to be aware of vehicular traffic and take appropriate precautions.

9.3 Hazard Communication

The following will apply to all commercial products containing hazardous substances brought on site during the project, in accordance with the OSHA Hazard Communication Standard, 29 CFR 1910.1200 as follows:

- ARSEC's Hazard Communication Program, as described in the *Corporate Health and Safety Manual*, approved Safety Procedure will be followed for hazardous materials brought on site. This program, a copy of which can be found on the attached CD in Appendix B, will be made available to all site personnel;
- The SSHO will maintain a Material Safety Data Sheet (MSDS) for each hazardous material brought to or used on-site;
- The SSHO will affix a hazard communication label providing information on health and physical hazards information to each container of hazardous material for those containers of hazardous materials not supplied with an adequate hazard label;
- The SSHO will train site personnel working with hazardous materials in accordance with the requirements of 29 CFR 1910.1200;
- The SSHO will maintain an inventory of hazardous materials used on site;
- The SSHO will inform personnel, including those employed by subcontractors, of the hazards of hazardous materials on site and the location of appropriate MSDSs; and
- Subcontractors are required to provide MSDSs to ARSEC and obtain approval of the SSHO prior to bringing hazardous materials on site.

9.4 Fire Prevention and Protection

This section details fire prevention and protection procedures/resources at the project:

- There are fire extinguishers mounted on all heavy equipment, as well as in ARSEC controlled facilities.
- ARSEC Hot Work Permits are required before flame or spark-producing activity is to commence.
- Flammable and oxidizing materials are to be stored in marked flammable storage cabinets in No Smoking areas with fire extinguishers available.
- Smoking will only be permitted in designated areas.
- Project personnel are only permitted to extinguish fires in their incipient stages and only if they have received fire extinguisher training within the last year. Fighting fires is prohibited by project personnel and will only be performed by the local fire department.

9.5 Housekeeping

Housekeeping will be a priority at the project site. The following provisions are in place to ensure that housekeeping is maintained at a high standard:

- The importance of housekeeping and the expectation that good housekeeping will be maintained will be a regular topic of the morning safety meetings.
- Job sites will be cleaned up on a daily basis.
- Subcontractors will be informed of their responsibilities to maintain their housekeeping.
- Radioactive contaminated waste containers will be surveyed and labeled per 10 CFR 20 and EM 385-1-1 requirements. As a minimum, each container of radioactive

contaminated waste will bear a durable, clearly visible label bearing the radiation symbol and the words **CAUTION, RADIOACTIVE MATERIAL**.

- Dumpsters and adequate trash receptacles are positioned at several locations and are to be regularly emptied. Contaminated trash must be segregated from sanitary trash for proper disposal. Hazardous waste containers will be labeled according to Resource Conservation and Recovery Act (RCRA) regulations.
- Housekeeping is an operational/safety item that is regularly considered during routine inspections.
- Nails will be removed immediately from scrap lumber.

9.6 Fall Protection

Site personnel working greater than four feet above the ground will implement fall protection procedures consistent with ARSEC's Fall Protection Program provided in Safety Procedure, a copy of which can be found in the *Corporate Health and Safety Manual* found in Appendix B of this document. Fall protection on this project may include the use of tripods, safety harnesses, appropriately-sized lanyards, and railings when appropriate. Fall protection measures will be implemented on this project during pumping collected water into storage tanks and, as appropriate, during entry into deep excavations. Tripods, harnesses, and lanyards will be inspected and maintained by personnel trained in accordance with 29 CFR 1926.503. Fall protection equipment will be inspected on a daily basis prior to and on days when in use for signs of wear.

The most common falling hazard will be due to wet or uneven ground associated with site task activities. As the work will be outdoors, wet ground could contribute to falls and injuries from slipping. Debris and vegetation growth could contribute to falls from tripping. Equipment and materials used during investigation activities also poses a slip, trip, and fall hazard. Slips, trips, and falls can lead to various injuries, such as foot and back injuries, abrasions, or lacerations. These hazards will be alleviated by safe practices, such as making personnel aware of and marking unsafe areas, clearing vegetation or debris that would contribute to unsafe working conditions, and good housekeeping measures for remediation equipment and material on the ground that could pose such a hazard.

9.7 Heavy Equipment Operations

ARSEC on-site personnel will be required to perform heavy equipment operations. These operations will be conducted in accordance with *Health and Safety Requirements Manual*, EM-385-1-1. The following additional measures will be implemented:

- Underground utilities will be located and identified prior to any intrusive activities;
- When an excavation area will not be backfilled upon completion of sampling (i.e., left open), the area around the excavation and the heavy equipment will be barricaded using orange safety fence and marked using safety/radiation work area tape;
- Emergency/first aid equipment [20-lb fire extinguisher/first aid kit/emergency communication equipment (radios, telephones, etc.)] will be readily available to site personnel;

- Physical hazards (overhead and underground) will be identified and marked where applicable;
- Appropriate MSDS for any hazardous materials brought onto the site;
- Site personnel will be trained in routine and emergency operations;
- All heavy equipment will be maintained in accordance with manufacturer's directions, operated by qualified experienced personnel and inspected daily;
- Operators of heavy equipment will be familiar with the emergency shutdown procedures;
- Personnel performing torch cutting of rebar and steel from rail spurs will receive prior training on its proper use and maintenance; and
- Air monitoring will be performed during all excavation/removal operations as described in Section 9.15.7

9.8 Drill Rig Safety

9.8.1 Inspection & Operations

Before being placed into service, the drilling equipment will be inspected by the lead driller in accordance with the manufacturer's guidelines. In used, all derricks are subject to the USACE *Crane and Derrick Inspection Criteria*, Appendix H; EM 385-1-1 prior to arrival at the project. The ARSEC Site Supervisor will accompany the lead driller during this initial inspection. Inspections shall be documented in the field activity daily log and shall demonstrate that all installed safety equipment is functional. The driller is responsible for the safe operation of the drill rig as well as the crew's adherence to the requirements of this APP/SSHP. The driller must ensure that all safety equipment is in proper condition and is properly used. The members of the crew must follow all instructions provided by the manufacturer of the drill rig, wear the required PPE, and be aware of all hazards and control procedures.

9.8.2 Set Up

The drill rig must be properly blocked and leveled prior to raising the derrick. The wheels that remain on the ground will be chocked if necessary and the parking brake set. The rig can only be moved after the derrick has been lowered.

9.8.3 General Preparatory Drilling Requirements:

- Work area access must be restricted from vehicular/pedestrian traffic by utilizing temporary fencing or warning tape.
- If lubrication fittings are not accessible with guards in place, machinery must be stopped and lockout/tagout procedures applied before oiling and greasing. Fuel, hydraulic fluid, oil, or lubrication fittings will not be refilled unless the drill rig engine has been turned off.
- Rigging equipment for material handling must be inspected prior to use on each shift and as often as necessary to ensure it is safe. Defective rigging must be removed from service immediately.

9.8.4 Underground Services

Prior to any intrusive activities, assurances must be made to preclude the possibility of contact with underground utilities. These include but may not be limited to electrical, communications, water, gas, and steam. Appropriate authorities must be made aware of such activities and a review of all locations where intrusions are planned must be conducted. If necessary, lockout/tagout procedures will be implemented for the safety of personnel performing intrusive activities.

9.9 Electrical Hazard Identification

While conducting field operations, care will be taken to ensure sufficient clearance between equipment and any energized power lines that may be installed or encountered along the way. The ARSEC SSHO will be responsible for identifying the voltage of energized lines that may impact ARSEC sampling and monitoring operations and documenting the voltages of such power lines in the appropriate AHA(s). Based on the SSHO's determinations, the following distances will be observed; 0 to 50 kilovolt (kV) - 10 feet (ft); 51 to 200 kV – 15 ft; 201 to 300 kV - 20 ft; 301 to 500 kV - 25 ft; 501 to 750 kV - 35 ft; and 751 to 1000 kV - 45 ft. To mitigate electrical hazards associated with lighting, generators, and/or equipment brought onsite the following controls will be implemented:

- Portable electrical equipment will be inspected prior to use to ensure double insulation and/or proper grounding;
- Electrical connections will be made through ground fault circuit interrupters (GFCIs); and
- Cords will be inspected for fraying or other damage prior to use. Any cords that fail to meet safety standards will be taken out of service and replaced.

9.10 Confined Space Entry

Although it is not anticipated for this project, confined space entry will be performed in accordance with the requirements of ARSEC's confined space entry program. This program, which complies with 29 CFR 1910.146, is presented in ARSEC's *Corporate Health and Safety Manual*, included in Appendix B. Confined space entries performed during this project will be considered permit required confined space entries. As such, a confined space entry permit will need to be completed each day during which confined space entries are performed. Properly trained and equipped personnel will be utilized to perform this work and all equipment will be inspected on a daily basis. Tripods, harnesses, lanyards, and air recirculation and monitoring equipment (i.e., Copus blowers and O₂/LEL meters, respectively) will be operated and observed by personnel with appropriate training in their respective roles.

9.11 Refueling and Storage of Flammable Liquids

Vehicles, pumps, and generators will use diesel fuel or gasoline. On-site refueling operations will be conducted as necessary, using either subcontractor fleet service refueling trucks, refueling using a 100-gallon fuel tank mounted on a pickup truck, and in approved safety cans. All on-site refueling operations will be performed using proper grounding techniques. A limited volume (five gallons or less) of gasoline may be stored on site in National Fire Protection Association-approved storage containers. Drip pans will be used during refueling to catch inadvertent minor

spillage. Smoking will not be allowed during any refueling operations. Personnel conducting refueling will not leave the refueling area until such operations are complete to minimize the potential for overfilling/spills. The SSHO or their designee will be present at all times during refueling operations to ensure compliance with the above procedures.

9.12 Night Operations Lighting

Outdoor work will be conducted during daylight hours; therefore the need for illumination is not anticipated.

9.13 Severe Weather

In the event of adverse weather conditions at the site such as lightning, high winds, extreme heat or cold, heavy snow, sleet, or freezing rain, the SSHO may instruct the workers to discontinue field operations.

The SSHO shall immediately discontinue field operations when lightning is observed and shall not resume operations until at least 30 minutes has passed since the last visible lightning strike. On-going field operations shall be evaluated by the SSHO and SS when sustained wind speeds in excess of 25 miles per hour (mph) occur. If field operations can be adversely affected by elevated wind speeds, the SSHO shall discontinue field operations.

9.14 Biological Hazard Identification

Biological hazards may be encountered in the field, including poisonous plants, wild and/or rabid animals, snakes, and insects.

9.14.1 Tick Bites

The Center for Disease Control has noted the increase of Lyme disease and Rocky Mountain spotted fever that are caused by bites from infected ticks that live in and near wooded areas, tall grass, and brush. Ticks are small, ranging from the size of a comma up to about one quarter inch. They are sometimes difficult to see. The tick season extends from spring through summer.

Lyme disease has occurred in almost all states, with the heaviest concentrations in the Northeast, upper Midwest and along the northern California coast. It is caused by ticks that have become infected with spirochetes. Deer ticks are about one quarter inch in size, and black or brick red in color. Male deer ticks are smaller and all black. The deer tick larvae are extremely small [approximately the size of a period (.)].

Standard field gear (work boots, socks, and long pants), which will be worn during all fieldwork, provides good protection against tick bites, particularly if the joints (i.e., between pant legs and tops of socks) are taped. Nonetheless, the following precautions will be taken when working in areas that might be infested with ticks:

- When in the field, check yourself often for ticks, particularly on your lower legs and areas covered with hair;

- Spray outer clothing, particularly your pant legs, boots, and socks, BUT NOT YOUR SKIN, with an insect repellent that contains permethrin or permethrin; and
- When walking in wooded areas, avoid contact with bushes, tall grass, or brush as much as possible;
- If you suspect that a tick is present, remove it with tweezers only, and not with matches or a lit cigarette. Grasp the tick near the head with the tweezers and pull gently. Do not use nail polish or any other type of chemical. Be sure and remove all parts of the tick's body. Once removed, disinfect the area with alcohol or a similar antiseptic. Keep the tick in a plastic bag and report the incident to the SSHO or CQCM; and
- Look for signs of the onset of Lyme disease, such as a rash that looks like a bull's eye or an expanding red circle surrounding a light area, frequently with a small welt in the center. This rash can appear from several days to several weeks after the tick bite. The first symptoms of either disease are flu like chills, fever, headache, dizziness, fatigue, stiff neck and bone pain. If immediately treated by a physician, most individuals recover fully in a short period of time. More serious symptoms can occur if left untreated. The SSHO or CQCM should be contacted if any of the above noted signs and symptoms are evident. Site personnel should consult with a physician for an examination and possible treatment if such symptoms occur.

9.14.2 Poisonous Plants

Site personnel need to be alert to the presence of poisonous plants. The most common types of poisonous plant are poison ivy, poison oak, and poison sumac. Skin contact with these plants can cause skin sensitization resulting in reddening, swelling, and itching of the affected areas. Skin exposure can result from either direct contact with the plant or contact with clothing/equipment previously exposed to the plant. Site personnel will receive training in the recognition of poisonous plants and methods for preventing exposure during site safety briefings.

9.14.3 Animal or Insect Bites

Animal bites or stings are usually nuisances (localized swelling, itching and pain) that can be handled by first-aid treatment. The bites of certain snakes and spiders contain sufficient poison to warrant medical attention. There are diseases that can be transmitted by insect and animal bites [e.g., Rocky Mountain spotted fever, Lyme disease (ticks), rabies [mainly dogs, skunks, raccoons, and foxes], malaria, and equine encephalitis (mosquitoes)]. The greatest hazard and most-common cause of fatalities from animal bites, particularly bees, wasps, and spiders, is from a sensitivity reaction. Shock due to stings can lead to severe reactions in the circulatory, respiratory, and central nervous systems, which also can result in death.

Assigned workers with a history of allergic reactions to bites will be required to have their prescribed treatment with them, and first aid-trained personnel on site will know where the medication is located. Stings or bites will be taken seriously. Anyone stung or bitten, with the exception of mosquito bites, will be required to stop work while that person is observed for signs of severe swelling, shortness of breath, nausea, or shock. Medical attention will be obtained if there is any doubt.

Wild animals should be avoided, particularly wild animals that are unusually passive or aggressive. Any such animals will be reported to the CQCM or SSHO. Skunks, raccoons, fox, and bats are wild animals most frequently infected with rabies; however, any warm-blooded animal can be infected. Animals suspected of being infected with rabies that bite an individual will be captured, at the direction of the SSHO or CQCM. On-site personnel will not attempt a capture unless it can be done safely and there is no risk of injury from, or bites by, the suspect animal. If on-site personnel cannot capture the animal easily, it should be kept under surveillance and appropriate assistance (such as a municipal animal control officer) will be called to capture the animal. The animal should then be tested. A dead animal suspected of infection should also be preserved and tested. Health departments are often sources of testing or obtaining information about where testing can be done.

The bite area should be washed with soap and water and disinfected with 70% alcohol as quickly as possible, followed by treatment by a doctor or emergency room. Rabies is preventable but treatment must begin immediately. Prompt medical attention and determining whether the animal is infected are very important.

West Nile virus (WNV) is a mosquito-borne disease that can infect humans, birds, horses and other mammals. WNV infection can cause a mild flu-like illness, or may cause no symptoms at all in most humans. However, in some cases it can cause severe neurological diseases such as encephalitis or meningitis, particularly among the elderly. WNV first appeared in North America in New York City in 1999. Since then, the virus has spread across the continental United States.

WNV is predominantly spread to humans by the bite of an infected mosquito. In 2002 other methods of human transmission were discovered. It has now been shown that WNV can be transmitted to humans who receive infected organs through transplantation, or who receive transfusions of infected blood or blood products. Also, in 2002 there was one case of transmission from a pregnant woman to her fetus and one mother-to-child transmission through breast milk. WNV is NOT spread by casual contact such as touching or caring for someone who is infected.

The following precautions will be taken from June - October, when mosquitoes are most active:

- Limit outdoor activities and wear protective clothing such as long pants and long-sleeved shirts, particularly when mosquitoes are most active;
- Avoid shaded, bushy areas where mosquitoes like to rest; and
- Use an insect repellent containing DEET to help reduce exposure to mosquitoes.

9.15 Site Safety and Health Program

9.15.1 Site Description and Contamination Characterization [Site Description-see Section 1.1]

Previous site investigation results indicate the potential presence of radionuclides, volatile organic compounds (VOCs) and metals during soil drilling/sampling and material handling. Worker exposure to these chemical constituents is expected to be relatively low during these

activities. Levels of personal protection identified in Section 9.15.5 are anticipated to fully protect worker health and safety for these constituents. Site Radiological Contaminants of Concern (RCOCs) are radium-226 (Ra-226), thorium-230 (Th-230), Th-232, uranium-238 (U-238), and americium-241 (Am-241). Sealed radiological sources used for instrument response checks will be kept on site and may include; cesium-137, (Cs-137), americium-241 (Am-241), thorium-230 (Th-230), strontium-90 (Sr-90), and technetium-99 (Tc-99). Radiation safety is addressed in the Radiation Safety Plan (Appendix E). The levels of protection and monitoring requirements outlined in this plan are expected to minimize the risk of worker exposure.

Project-specific hazards that have the potential to affect worker and public safety are discussed below.

Site soils may contain non-volatile constituents that may become airborne (in respirable forms) from dust. Periodic dust monitoring will be performed for the purpose of confirming that dust levels are below the calculated action level of combined dusts of 2.0 mg/m³. It is anticipated that readings will be taken periodically during the day, particularly where dust concentrations are anticipated to be the greatest. Dust control measures including spray down of soils will be implemented to minimize generation of airborne dust.

A photo ionization detector (PID) will serve as the first line of qualitative sampling in detecting organic compounds at the Site during intrusive activities. A Quad Gas monitor will also be used to detect O₂, LEL, CO, and H₂S gases. If the PID levels exceed 5 parts per million (ppm), the workers will be required to upgrade from modified Level D PPE to Level C PPE.

9.15.2 Hazard/Risk Analysis [see Appendix D]

9.15.3 Staff Organization; Qualifications; Responsibilities [see Section 3.0]

9.15.4 Training- General, Supervisor, and Project Specific [see Section 5.0 and Appendix E]

9.15.5 PPE- Personal Protective Equipment

All field personnel performing on-site remediation will be required to use the appropriate level of protection for the primary identified site hazard. The SSHO and SRSO will monitor implementation of personal protection.

9.15.5.1 Anticipated Levels of Protection

Most work associated with this project will be performed in Level D Protection or modified Level D, as defined in Appendix B of OSHA Standard 29 CFR 1910.120 – “Hazardous Waste Operations and Emergency Response.” Specifically, this consists of Level D for Tasks 1, 2, 3, 4, and 5. Level D will be used initially for Task 1-5 and Modified Level D (see Table 9-1) only if air sampling provides sufficient information to allow for a downgrade. Upgrading or downgrading the level of protection for Site personnel will be reserved to the discretion of the

Table 9-1. Personal Protective Equipment for On-Site Sampling and Surveying Activities

PPE Level	Activity	Protective Equipment
D	<ul style="list-style-type: none"> • Mobilization/Demobilization • Site Preparation • Survey of Overburdened materials • Perimeter Monitoring 	<ul style="list-style-type: none"> • Steel-toed safety boots • Safety glasses/goggles • Gloves • Hard hat
D-modified (Initially) C (As Required)	<ul style="list-style-type: none"> • Excavation • Drilling 	<ul style="list-style-type: none"> • Safety boots, with vinyl/rubber outer boots (or rubber steel-toed boots) • Chemical-resistant Tyvek™ clothing • Safety glasses/goggles • Hard hat • Outer rubber gloves over inner surgical Nitrile/latex gloves • Half-face respirators

SSHO and SRSO based on extenuating circumstances in addition to available results and information, activities, and site conditions. PPE consisting of Tyvek suits, gloves, and shoe covers or easily decontaminated boots shall be worn in the work zones when initiating drilling activities in new investigative areas or when removable contamination greater than 700 dpm/100cm² is encountered. PPE levels shall be downgraded at the discretion of the site RSO and SSHO based on the results of on-site monitoring and off-site analytical results, including the analytical results from the 50+ borings installed in November 2009.

9.15.5.2 Minimum Requirements

Minimum requirements for all tasks include steel-toe and steel shank work boots, with standard field dress consisting of long pants. Hard hats and safety glasses will be worn at all times while on the job site except in the temporary office/break trailer. It will be at the discretion of the SSHO based on tasks, site conditions, and other influencing factors for the use of optional equipment. Use of optional equipment for personal protection will not compromise action levels or the requirements of this Plan.

9.15.5.3 PPE Selection Criteria

Hard hats, safety glasses and work boots were selected to provide protection against some of the physical hazards associated with the proposed operations. In addition, Nitrile™ gloves will be used by personnel manually handling contaminated soil, liquids and/or equipment.

9.15.5.4 PPE Modification Criteria

It is not anticipated that chemical contamination (over and above the hazards previously described) will be encountered on this site. Additional PPE, engineering controls, and contaminant-specific monitoring will be implemented under the direction of the SSHO if monitoring for chemical contaminants (see Sections 8.0 and 9.0) indicate action levels are exceeded. If such site conditions change, the SSHO, in consultation with the ARSEC SRSO, ARSEC Corporate RSO, and the ARSEC ES&H Manager as appropriate, will decide upon the upgraded PPE levels. Necessary modifications to PPE will be implemented in the field and/or

incorporated into the Hazardous Work Permits (HWPs), and will be discussed in tailgate safety meetings as necessary. Additional site information, actual site conditions, or site monitoring (real-time and time-integrated) will be used to confirm or adjust the selected levels of PPE as authorized by the SSHO with concurrence from the ARSEC's SRSO, Corporate RSO, and the Corporate Health and Safety Manager as appropriate. This can occur when action levels or exposure limits are reached, when exposure levels are confirmed below action levels for PPE in use, or when the need arises to increase the levels of protection for site personnel. During minor work activities when contact with hazardous materials is not expected, Modified D PPE may be downgraded to exclude the use of Tyvek coveralls. For all other actions, Levels of PPE will not be downgraded from those specified, when established action levels are exceeded (refer to Section 8.0 of this APP/SSHP), without prior approval from the ARSEC's SRSO, Corporate RSO, and the Corporate Health and Safety Manager as appropriate.

9.15.6 Medical Surveillance

The following medical surveillance requirements shall be adhered to for this Project

Any ARSEC personnel or subcontractors wearing respirators shall participate in a medical surveillance program that meets the requirements of OSHA 29 CFR 1910.134, Respiratory Protection.

Any ARSEC personnel who may be exposed to noise levels at or above 85 dBA 8-hour time weighted average, without regard to hearing protection devices, are required to participate in an audiometric testing program provided by SEC.

ARSEC shall provide and adhere to the medical monitoring requirements specified in OSHA 29 CFR 1910, Subpart Z, Toxic and Hazardous Substances, and OSHA 29 CFR 1926.

Medical surveillance shall be conducted in compliance with OSHA 29 CFR 1910.120 and 1910.134. Physical examinations are required for:

- Any and all personnel entering hazardous or transition zones or performing work which required respiratory protection
- All on site ARSEC personnel that may be used for emergency response purposes.
- ARSEC supervisors entering hazardous or transition zones
- Personnel who will be on site for more than 16-hours during the length of the contract.

Physical examinations are not required for people making periodic deliveries provided they do not enter the exclusion zone.

On termination of employment, personnel who have worked at a site for more than six - months since their last examination may be required to undergo an examination equivalent to the baseline health assessment. The decision on whether an exit examination is required will be based, in part, on exposure history occurring during the time elapsed since the most recent examination and applicable regulatory requirements.

Any worker exposed to potentially harmful environments will undergo a supplemental examination, if deemed appropriate by the examining or consulting physician.

9.15.7 Exposure Monitoring/Air Sampling Program [see Appendix E for Radiological Monitoring Requirements]

Monitoring for non-radiological contamination will consist of real-time monitoring using direct reading instruments to identify potential elevated exposure levels. Background readings will be taken in an area known to be free of contamination. Initial readings at the start of activities in areas of known or suspected contaminants will be performed to determine if levels of hazardous contaminants exist that will require a reevaluation of safety requirements.

During all intrusive work activities where chemical contamination or nuisance dust is suspected, or visible dust is observed, real-time air monitoring will be conducted. Real-time air monitoring will also be performed in special circumstances: confined space entry or during spills. The real-time instrumentation that will be used is listed as follows:

- Quad-Gas monitor for monitoring LEL, H₂S, CO, and O₂.
- PID monitoring will be conducted with an 10.6-electron volt (eV) lamp.
- Dust Trak aerosol monitor for total dust.

9.15.7.1 Dust Monitors

Metal contaminants in dust are not expected to be of significant concern. However, ARSEC will periodically perform excavation area dust monitoring as an indicator that the engineering controls employed during excavation efforts are adequate. (i.e., nuisance dust levels are maintained below threshold guidelines to protect ARSEC personnel performing surveys and sampling at or near excavation operations. Intermittent dust monitoring will be conducted using a Dust Trak or equivalent aerosol monitor with data logging capability during work activities that may result in hazardous particulates becoming airborne. Intermittent dust monitoring is employed by using a real-time aerosol monitor which produces real-time readings and computes time-weighted averages. Intermittence is dependent on dust generation by activity. There is no set frequency; frequency will be determined by SHSO after assessing migratory nuisance dust risk based on activities, environmental variables, controls in place, etc. Thermo Data-RAM, or equivalent, continuous real-time aerosol monitors will be performed down wind and at the perimeter, of excavation activities. The Dust Trak and Thermo Data-RAMs will be calibrated prior to use in accordance with the manufacturers procedures. The location of the monitors will be recorded with GPS surveying equipment, and the time period of operation will be recorded. The SSHO/SRSO will determine the Time Weighted Average (TWA) and maximum concentration of dust identified during the monitor period. Monitoring will be completed daily during start-up of excavation operations, to establish a baseline and effectiveness of dust suppression engineering controls. Monitoring will be downgraded to once per week if data from the start-up monitoring indicate that engineering controls are adequately mitigating nuisance dust levels.

Readings at action levels warrant the following procedures:

- All personnel will stop work in the area and assemble upwind.
- Additional monitoring will be performed to substantiate previous readings.

- If previous readings are substantiated, controls (engineering/administrative) will be implemented to maintain air quality within safe levels or personnel will upgrade to the appropriate level of protection.

9.15.7.2 *Quad-Gas Monitors and Photoionization Detector*

A PID will be used to monitor for VOCs as well as a quad-gas meter to monitor for O₂, LEL, CO, and H₂S during all core extractions and when acetate liners are being opened for beta radioactivity scanning. Action will be taken in accordance with the guidelines presented in Section 8.0. The instrument will be calibrated the morning of each day of use in accordance with the manufacturers' procedures. Additional calibration may be completed at the discretion of the instrument operator if significant weather variations occur during the course of the day. Suspect soil will be screened by placing a sufficient quantity of soil collected into a one-gallon Ziploc baggie, or in a eight-oz. clear glass jar covered with aluminum foil wrap. The baggie/jar will be sealed, shaken, and the PID probe tip will be inserted into a corner of the baggie or pierced through a small opening in the foil wrap, to evaluate the "headspace," while maintaining a tight seal over the remainder of the opening. This method will be used for screening purposes only; soil gas or soil vapor samples will not be collected for off-site analysis.

Action levels above background and monitoring frequency, as determined by real-time instrumentation are as follows:

- Organic Vapor At Work Site: 5 ppm - upgrade PPE 10 ppm - stop work

9.16 Heat and Cold Stress – Procedures and Practices

9.16.1 *Heat Stress*

Heat stress monitoring will be conducted for work performed when the air temperature exceeds 70 degrees Fahrenheit (°F). Personnel performing field activities will be made familiar with the signs and symptoms of heat stress. These symptoms include:

- Heat cramps: Painful muscle spasms, usually occurring in the abdomen and legs. Heat cramps are often the first signals that the body is succumbing to heat exposure.
- Heat exhaustion: Dizziness, light-headedness, slurred speech, rapid pulse, confusion, fainting, fatigue, copious perspiration, cool skin that is sometimes pale and clammy, and nausea.
- Heat stroke: Hot, dry, flushed skin; delirium, and coma (in some cases). Heat stroke is a life-threatening event and requires immediate medical attention.

Heat stress can be prevented by resting frequently in a shaded area and consuming large quantities of fresh, potable water. Dilute electrolytic-replenishing beverages, such as Gatorade®, may be used as a secondary source of fluid replacement. If heat exhaustion symptoms are observed, the affected individual will be required to rest in a shaded area and consume liquids until symptoms subside. Immediate medical attention will be provided if symptoms persist or appear to worsen. This will involve limiting the work/rest regimen so that after one minute of rest, a person's heart rate does not exceed 110 beats per minute. Work-rest regimens will be

implemented as provided in Table 9-2. Heart rate monitoring will be performed at each break. No worker will be permitted to return to work activities if their heart rate is higher than 110 beats per minute.

Table 9-2. Recommendations for Work/Rest Cycle Durations to Reduce Heat Stress

Work Demand	ACCLIMATIZED EMPLOYEES				NON-ACCLIMATIZED EMPLOYEES			
	Light	Moderate	Heavy	Very Heavy	Light	Moderate	Heavy	Very Heavy
100% Work	85.1° F 29.5° C	82.1° F 27.8° C	78.8° F 26.0° C	NO WORK	85.1° F 29.5° C	77.0° F 25.0° C	72.5° F 22.5° C	NO WORK
75% Work 25% Rest	86.9° F 30.5° C	83.3° F 28.5° C	81.5° F 27.5° C	NO WORK	84.2° F 29.0° C	79.7° F 26.5° C	76.1° F 24.5° C	NO WORK
50% Work 50% Rest	88.7° F 31.5° C	85.1° F 29.5° C	83.3° F 28.5° C	81.5° F 27.5° C	86.0° F 30.0° C	82.4° F 28.0° C	79.7° F 26.5° C	77.0° F 25.0° C
25% Work 75% Rest	90.5° F 32.5° C	87.8° F 31.0° C	86.0° F 30.0° C	85.1° F 29.5° C	87.8° F 31.0° C	84.2° F 29.0° C	82.4° F 28.0° C	79.7° F 26.5° C

The next work period will be shortened by 33% if, after the next break, the heart rate is higher than 110 beats per minute after one minute of rest, while the length of the rest period stays the same. Resting heart rate will be established prior to start of on-site activities when ambient temperatures exceed 70° F and workers are wearing impervious clothing or when temperatures exceed 85° F.

The victim will be cooled immediately and emergency medical services will be called if symptoms of heat stroke are observed. Workers will not hesitate to seek medical attention if heat stroke is suspected.

One or more of these additional mitigating measures may also be implemented:

- Provide a cool environment in the work vicinity (an air-conditioned box van, for example);
- Use ice vests while in PPE to provide cooling to the worker; and
- Reschedule work for cooler times of the day (early evening or early morning).

9.16.2 Cold Exposure

Exposure to cold temperatures increases the likelihood and potential for worker disorders or conditions that could result in injury or illness. Extreme low temperatures may not be the only element necessary to create the potential for cold exposure disorders or conditions; strong wind accompanied by cold temperatures can lead to these types of disorders or conditions.

Wind chill factor is the cooling effect of any combination of temperature and wind velocity or air movement. The wind chill index (Table 9-3) will be consulted when planning for exposure to low temperatures and wind. The wind chill index does not take into account the specific part of

Table 9-3 Wind Chill Factors

		Temperature (F)																		
		40	35	30	25	20	15	10	5	0	-5	-10	-15	-20	-25	-30	-35	-40	-45	
Wind Speed (MPH)	5	36	31	25	19	13	7	1	-5	-11	-16	-22	-28	-34	-40	-46	-52	-57	-63	5
	10	34	27	21	15	9	3	-4	-10	-16	-22	-28	-35	-41	-47	-53	-59	-66	-72	10
	15	32	25	19	13	6	0	-7	-13	-19	-26	-32	-39	-45	-51	-58	-64	-71	-77	15
	20	30	24	17	11	4	-2	-9	-15	-22	-29	-35	-42	-48	-55	-61	-68	-74	-81	20
	25	29	23	16	9	3	-4	-11	-17	-24	-31	-37	-44	-51	-58	-64	-71	-78	-84	25
	30	28	22	15	8	1	-5	-12	-19	-26	-33	-39	-46	-53	-60	-67	-73	-80	-87	30
	35	28	21	14	7	0	-7	-14	-21	-27	-34	-41	-48	-55	-62	-69	-76	-82	-89	35
	40	27	20	13	6	-1	-8	-15	-22	-29	-36	-43	-50	-57	-64	-71	-78	-84	-91	40
	45	26	19	12	5	-2	-9	-16	-23	-30	-37	-44	-51	-58	-65	-72	-79	-86	-93	45
	50	26	19	12	4	-3	-10	-17	-24	-31	-38	-45	-52	-60	-67	-74	-81	-88	-95	50
	55	25	18	11	4	-3	-11	-18	-25	-32	-39	-46	-54	-61	-68	-75	-82	-89	-97	55
	60	25	17	10	3	-4	-11	-19	-26	-33	-40	-48	-55	-62	-69	-76	-84	-91	-98	60

“New” Wind Chill Formula: $T_{(wc)} = 35.74 + 0.6215T - 35.75(V^{0.16}) + 0.4275T(V^{0.16})$

Frost Bite Times	30 Minutes	10 Minutes	5 Minutes
------------------	------------	------------	-----------

Source: National Weather Service, 2001

the body exposed to cold, the level of activity that affects body heat production, or the amount of clothing being worn.

The human body senses "cold" as a result of both the air temperature and the wind velocity. Cooling of exposed flesh increases rapidly as the wind velocity goes up. Frostbite can occur at relatively mild temperatures if wind penetrates the body insulation. For example, when the actual air temperature of the wind is 40° F (4.4° C) and the velocity is 30 miles per hour, the exposed skin would perceive this situation as an equivalent still air temperature of 13° F (-11° C).

The generally recognized cold disorders or conditions are:

- Frostbite - The freezing of tissue that most commonly affects the toes, fingers and face
- Hypothermia - Systemic hypothermia occurs when body heat loss exceeds body heat gain and the body core temperature falls below the normal 99° F

Contributing factors to these disorders or conditions are:

- Exposure to humidity;
- High winds;
- Contact with wetness;
- Inadequate clothing; and
- Poor worker health.

The physical conditions that effect cold exposure disorders or conditions are the same as those associated with heat disorders or conditions, such as physical fitness, alcohol or drug use, and disease.

The presence of dead air space between the warm body and clothing and the outside air is essential. Many layers of relatively light clothing with an outer shell of windproof material maintains body temperature much better than a single heavy outer garment worn over ordinary indoor clothing. The more air cells each clothing layer has, the more efficient it insulates against body heat loss. Clothing also needs to allow some venting of perspiration. In addition to adequate clothing, whenever possible, full use will be made of windbreaks and heat tents. Table 6-4 provides time periods at which frost bite can occur based on temperature and wind speed.

9.17 SOPs; Standard Operating Procedures; Engineering Controls; Work Practices [see Appendix B and Appendix E, Section 11.1]

9.18 Site Rules/Prohibitions [see Section 9.2]

9.19 Work Permit Requirements [see Appendix E]

9.20 Material Handling Procedures [see Appendix B]

9.21 Site Control Measures

Site control measures shall be implemented to minimize potential exposure to, and accidental spread of, contaminants during work activities. The following work zones are required to be established:

- Exclusion
- Contamination Reduction [CRZ]
- Support

The zone boundaries may be modified as material removal from the site progresses. Zone posting requirements are discussed in Appendix E, Section 11.

The Exclusion Zone(s) will be established where there will be direct contact with the contaminated material. Modification to the size and boundary of the Exclusion Zone will be made based on operations and wind direction. The Exclusion Zone may be designed to facilitate separation of the drilling operations, thus keeping the walkover surveyors in a contamination-free location.

The CRZ (s) will be established to minimize the spread of contaminants from the Exclusion Zone into clean areas. The CRZ will consist of the area located in front of or next to the exclusion zone.

Support Zones will be maintained as non-contaminated areas and will be used as storage areas for operations equipment and where restroom and break facilities will be located. Health Physics Technicians will designate radiological work zones as Radiation Areas and/or Radioactive Materials Areas, etc., as appropriate in accordance with the Radiation Safety Plan, Appendix E.. Access to these areas will be limited for the purpose of protecting individuals against undue risks from exposure to radiation and radioactive materials.

All personnel entering and exiting Exclusion and Contamination Reduction Zones will sign in and out through the Support Zone. The log will indicate the date and time entering and exiting, the location entered, personal protective equipment utilized and procedures to be followed.

9.22 Personal Hygiene and Decontamination

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

The decontamination process is composed of a series of steps performed in a specific sequence. The basic concept is that more heavily contaminated items will be decontaminated and removed first, followed by decontamination and removal of inner, less contaminated items.

During work activities at the Site, all items taken into an EZ must be considered contaminated and must be carefully inspected and/or decontaminated before leaving the site. Any contaminated equipment and material will be cleaned and decontaminated to the satisfaction of the SSHO prior to leaving the EZ.

Radiation detection instruments will be used at the site to monitor for contamination. Portable instruments will be used to monitor or frisk personnel upon exiting EZs and for releasing equipment from EZs and/or the site. The monitoring equipment will typically consist of an alpha sensitive zinc sulfide scintillation detector coupled to an appropriate ratemeter, or equivalent. Similar instruments equipped with either an alpha sensitive zinc sulfide scintillation detector or a gas flow proportional detector configured with a sample holder will be used to count smears for assessing removable contamination.

Personnel decontamination will be provided by proper removal of PPE in accordance with ARSEC SOPs. Additionally, workers will wash their hands and face as soon as possible after egress from any EZ and doffing of PPE.

After doffing PPE, personnel will frisk themselves for radioactive contaminants with an appropriate survey instrument to determine if personnel decontamination is warranted. Monitoring is required upon exiting a Contamination Area or Airborne Radioactivity Area, and as directed by the ARSEC SRSO. If skin contamination is suspected, workers will be required to stay in the area and contact ARSEC HP technicians for assistance. ARSEC HP technicians under direction of the ARSEC SRSO or ARSEC SSHO shall perform skin decontamination and subsequent monitoring. The need for bioassay sampling will be evaluated on a case-by-case basis. Upon release from the area workers will be directed to wash hands and face to remove any potential chemical contaminants.

Any employee suspected of experiencing skin contact with hazardous chemical materials will remove all clothing which may have absorbed the chemical contaminant (as modesty permits and exposure warrants); thoroughly wash the affected area(s); and don clean clothes. Following this, he / she must report the incident to the ARSEC SSHO.

9.23 Equipment Decontamination

Equipment decontamination procedures are detailed in ARSEC SOP [see Appendix B], titled *Decontamination of Equipment and Tools* and is summarized below. Any equipment used in an EZ will be decontaminated at the excavation area by removing all loose soil. Subsequent decontamination will be performed as necessary until verified clean, and may include:

- Washing and/or wiping until visibly clean;
- Low pressure, non-phosphate, detergent wash with wiping

A release survey will be completed at the excavation area prior to moving the equipment to the next work location on site. Small tools and other equipment (i.e., field meters, etc.) will be wrapped in plastic prior to being moved between contaminated areas of the site and will be decontaminated prior to being moved to un-contaminated areas of the site or off site. All equipment will be decontaminated and surveyed in accordance with requirements of the task-specific RWP. As much equipment as possible will be dedicated for single use for the duration of the project and, upon final release, will be surveyed and verified in conformance with the site unrestricted (free) release limits.

Equipment requiring maintenance or repair will generally be decontaminated prior to servicing. Reusable sampling equipment and any other tools used for intrusive work will be decontaminated between sampling locations, as necessary. Following decontamination, all equipment will be surveyed by an ARSEC HP technician.

9.24 Emergency Equipment and First Aid [see Section 8.5]

9.25 Emergency Response and Contingency Procedures [see Appendices C, ARSEC SOP HS-001, Section 11 and Appendix D]

10.0 RISK MANAGEMENT PROCESSES

10.1 Activity Hazard Analyses

AHA is an ongoing process from the initiation of the APP/SSHP preparation through the implementation and completion of a project. AHAs are completed for each task of a field project and modified in response to changing field conditions as necessary. Site-specific AHAs for remediation on this project are presented below. The hazards associated with each activity on the project and the measures designed to control or mitigate those hazards are identified in Table 10-1. Equipment and training requirements for the various types of work required to complete the project are included in Table 10-2.

Monitoring equipment and PPE for health and safety protection on the project are described in Sections 9.0 and 10.0 of this APP/SSHP, respectively. Additional field equipment is specified in the SAP for this project. The analysis for radiological hazards and radiological equipment and training requirements are presented the Radiation Safety Plan (Appendix E).

Copies of the preliminary draft AHAs for ARSEC activities associated with the Tonawanda Landfill site are included in Appendix D of this document.

Table 10-1. Activity Hazards

Task	Hazards	Hazard Control
All Tasks	Housekeeping	Materials will be stored to prevent intrusion into the work areas. Work areas will be kept organized.
	Fire	Flammable liquids will be stored in safety containers and flammable storage cabinets. Properly rated fire extinguishers, not less than 10-LB, will be placed within 50 feet wherever 5 gallons or more of flammable or combustible liquids are used, or not less than 20-LB within 25-75 feet of flammable liquid storage areas, within site vehicles, and around operating diesel or gasoline powered equipment, and inside site trailer(s).
	Electric Hazards	Generators will be grounded unless self-grounded. Extension cords will be properly rated for intended use and will be Ground Fault Circuit Interrupter (GFCI) protected. Authorities will be contacted for clearance or permits prior to any intrusive activity. Elevated parts of machinery, ladders, and antennas will be kept at least 10 ft from overhead electric lines. Qualified electricians will make all electrical installations. A lockout/tag out program will be implemented.
	Hand tools, manual and power	Tools will be inspected prior to use. Damaged tools will be tagged out-of-service until repairs can be performed by a qualified person. Tools will be used properly and for their intended purpose.
	Traffic	Work areas will be clearly barricaded and appropriate signs displayed. Traffic will be rerouted as necessary. Persons working near roadways, around heavy equipment, or directing traffic will wear high visibility vests.

Table 10-1. Activity Hazards (cont.)

Task	Hazards	Hazard Control
All Tasks, cont'd	Strains and sprains from manually lifting and moving	Proper lifting techniques will be used such as keeping a straight back, lifting with legs; personnel will avoid twisting back, will use mechanical equipment, or get help from others.
Task 2 Site Clearing	Injury due to lack of proper PPE	All clearing/grubbing work requires additional PPE <ul style="list-style-type: none"> • Safety toed, sturdy work boots. • Safety Glasses to protect eyes from debris. • Long-legged pants to protect legs and thighs. • Long sleeve shirt. • Ear protection. • Leatherwork gloves. • Standard hardhat.
	Fire	<ul style="list-style-type: none"> • A multipurpose fire extinguisher, with current inspection documentation tag, shall be within 50 feet of all clearing/grubbing operations. • Clearing/Grubbing team members shall be trained in the use of a fire extinguisher. • Clearing/Grubbing equipment shall be fueled only from a safety fuel can which is less than five gallons in size, and that has the proper cap and flashback suppression screen. • All refueling shall be performed in a designated area. • Equipment shall be fueled only after the unit has cooled for at least three minutes. • No equipment shall be used that is leaking fuel.
	Noise	Equipment operators shall wear ear protection unless verified to be under the OSHA permissible exposure limit (PEL) by the ES&H Representative.
	Moving mechanical parts from heavy equipment operations	Personnel will be made aware of the hazard and will coordinate carefully during equipment operations. Guards will be kept in place during operation. A safe distance will be maintained from moving heavy equipment and personnel will wear reflective safety vests in the area. Equipment operators should look in the direction of travel; look before backing up. Arrange traffic flow to prevent foot traffic from crossing the routes of heavy equipment as much as possible.
Tasks 1 & 6: <ul style="list-style-type: none"> • Mobilization • Investigation Derived Waste 	Moving mechanical parts from heavy equipment operations	Personnel will be made aware of the hazard and will coordinate carefully during equipment operations. Guards will be kept in place during operation. A safe distance will be maintained from moving heavy equipment and personnel will wear reflective safety vests in the area. Equipment operators should look in the direction of travel; look before backing up. Arrange traffic flow to prevent foot traffic from crossing the routes of heavy equipment as much as possible.
	Striking and being struck by operating equipment, loads, falling objects and pinch points	Workers will stay out of the swing area of all equipment and from under loads. No personnel will ride on the equipment unless seats are provided. Workers exposed to traffic hazards will wear traffic/reflector vests.

Table10-1. Activity Hazards (cont.)

Task	Hazards	Hazard Control
<p>Tasks 4 & 5:</p> <ul style="list-style-type: none"> • Surface & Subsurface Soil Drilling & Sampling • Groundwater Well Drilling & Sampling 	<p>Radiation hazards – potential handling of contaminated materials, water & soils</p>	<p>Since these tasks involve intrusive activities resulting in handling of potentially contaminated materials, the appropriate PPE shall be implemented for these tasks. Initial drilling activities will be monitored for radioactivity to establish that hazardous conditions do not exist and to ensure the levels of protection are correct.</p>
	<p>Chemical hazards – These tasks involve intrusive activities and potential contact with site contaminants VOC and metal contamination may possibly exist in the soil being drilled</p>	<p>Tasks 4 & 5 activities resulting in handling of potentially contaminated materials requires that the appropriate PPE shall be implemented for these tasks. Initial drilling activities will be monitored with a PID and a Quad-Gas monitor to establish that hazardous conditions do not exist and to ensure the levels of protection are correct.</p>
	<p>Moving mechanical parts from heavy equipment operations</p>	<p>ARSEC personnel will be made aware of the hazard and will coordinate field operations to minimize the interaction with heavy equipment operations. A safe distance will be maintained from operating equipment.</p>
	<p>Moving mechanical parts from heavy equipment operations</p>	<p>Personnel will be made aware of the hazard and will coordinate carefully during equipment operations. Guards will be kept in place during operation. A safe distance will be maintained from moving heavy equipment and personnel will wear reflective safety vests in the area. Equipment operators should look in the direction of travel; look before backing up. Arrange traffic flow to prevent foot traffic from crossing the routes of heavy equipment as much as possible.</p>
	<p>Noise from equipment operation</p>	<p>Hearing conservation program will be established, high noise areas identified, and hearing protection provided as appropriate. Latest American Conference of Governmental Industrial Hygienists (ACGIH) guidelines will be used. Hearing protection shall be worn by personnel working around heavy equipment.</p>

Table 10-1. Activity Hazards (cont.)

Task	Hazards	Hazard Control
<p>Task 3: Gamma Walkover Survey</p>	<p>Potential for severe injury during operation, refueling of UTV</p>	<ul style="list-style-type: none"> • All motorized-wheeled equipment is subject to radiological surveys by the appropriate radiological personnel. • All motorized-wheeled equipment is subject to safety inspections prior to entry into the site. • All motorized –wheeled equipment shall be in good repair without cooling, hydraulic, lubricant, and fuel leaks. • Only personnel experienced in the operation of motorized-wheeled equipment shall operate the unit. • Extreme caution shall be taken when refueling vehicles and equipment • No stationary or small engine device shall be fueled until it is turned off and allowed to cool. • No equipment is allowed to run over any electric or ground wire. • Tire pressure shall be checked each day and maintained for safe operation. • All motorized, wheeled work equipment shall have the required and properly inspected fire extinguishers available. • When an employee finds damaged or broken motorized vehicle, he/she shall mark it in some way so the motorized vehicle is not used again until it can be disposed for repair or disposed from the work site • Seat belts and other applicable operator restraints shall be worn at all times of operation.

Table 10-2. Equipment and Training Requirements

Activity	Equipment	Inspection	Training
All on-site work	Not applicable	Daily inspections will be performed on all safety equipment	<p>Employees will be trained on the SSHP and the associated hazards including physical hazards. Initial site-specific training will be conducted, and workers will be trained in proper monitoring and decontamination procedures. Safe work practices and good housekeeping will be followed. Personnel will be informed of the contaminants and chemicals at the Site and availability of MSDSs.</p> <p>A minimum of one person will be trained in the OSHA hazardous operations workers training for supervisors.</p> <p>A minimum of two people will be trained in first aid and CPR.</p> <p>Daily safety meetings will be conducted before beginning the work.</p>
Equipment Operation	Heavy equipment (Including manlifts and snorkel lifts)	Equipment operators will conduct daily inspections and necessary maintenance of the equipment.	Equipment will be operated by qualified operators with appropriate OSHA required 40-hr training (and 8-hr refresher if applicable). An initial site-specific training will be conducted, and workers will be trained in proper monitoring and decontamination procedures.
Equipment Operation - Continued	Gas powered generator and torch cutting equipment	Daily inspections and routine maintenance will be performed. Inspections for electrical safety, housekeeping, and lockout/tag out procedures will be performed (as necessary).	Same as above.
	Radiation detection equipment	Daily source and background checks will be performed and documented. Licensed radiation sources used for calibration will have appropriate licensing and documentations and will undergo routine leak testing.	Equipment will be operated by qualified personnel that are knowledgeable and trained in the operation of the equipment and interpretation of results and for radiological hazards.

APPENDIX A

ARSEC Radiation Protection Plan (APP/SSHP) Acknowledgment Form

The remainder of this page intentionally left blank

APPENDIX B

ARSEC Corporate Environment, Safety, and Health Manual and Procedures

(A copy will be submitted via Rev. 1)

The remainder of this page intentionally left blank

APPENDIX C

EMERGENCY CONTACT LIST AND HOSPITAL DIRECTIONS

The remainder of this page intentionally left blank

TONAWANDA LANDFILL SITE EMERGENCY CONTACT LIST

SERVICE	TELEPHONE NUMBER
Kenmore Mercy Hospital 2950 Elmwood Avenue Tonawanda, NY14217	440-354-2400 (information) (911) or 440-953-6700 (emergency)
Tonawanda Police (Emergency)	(911) or 716-692-2102
Tonawanda Fire Department (Emergency)	(911) or 716-692-8400
USACE- Buffalo Project Manager: [REDACTED]	(716) 879-4287 (Office)
USACE-Buffalo COR: [REDACTED]	716-829-4214 (Office) 716-310-2677 (Cell)
ARSEC Project Manager: [REDACTED]	803-279-0418 (Office) 513-673-1906 (Cell)
ARSEC ES&H Manager: [REDACTED]	865-251-2064 (Office) 865-256-9812 (Cell)
ARSEC Corporate RSO: [REDACTED]	724-312-8935 (Cell)
ARSEC SRSO: [REDACTED]	225-505-1091 (Cell)
ARSEC Site CQCSM: [REDACTED]	865-384-6132 (Cell)
ARSEC SHSO: [REDACTED]	865-742-5388 (Cell)
CHEMTREC	800-424-9300
Poison Control	800-888-7655

This list should be prominently posted in the ARSEC Site office. This list should also be carried in a vehicle or by an individual while working in survey or sampling locations remote from the field office area.

ARSEC personnel will immediately dial 911 to request emergency services in the event of an emergency requiring outside emergency services. ARSEC personnel will contact USACE onsite personnel following the phone call to inform them that emergency service personnel and equipment will be entering the facility. Subsequent to these notifications, appropriate off-site personnel of USACE and ARSEC will be contacted and informed about the situation.

DIRECTIONS

Kenmore Mercy Hospital

2950 Elmwood Avenue, Kenmore, NY 14217

Directions from Tonawanda Landfill Site to Kenmore Mercy Hospital

- | | |
|---|---------------------------|
| 1. Head south on E Park Dr toward Oriskany Dr
About 1 min | go 0.4 mi
total 0.4 mi |
|  2. Turn left at Ensminger Rd
About 2 mins | go 0.7 mi
total 1.1 mi |
|  3. Turn right at Military Rd
About 2 mins | go 0.7 mi
total 1.8 mi |
|  4. Turn left
Destination will be on the right
About 2 mins | go 0.3 mi
total 2.1 mi |



APPENDIX D

**ARSEC Preliminary Draft Activity Hazard Assessments (AHAs) for the
Pre-Remediation Volume Uncertainty Reduction Subsurface Soil Sampling at the
Tonawanda Landfill FUSRAP Site, Erie County, New York (Town of Tonawanda)**

The remainder of this page intentionally left blank



AHA Number 01 – Mobilization and General Work Activities		Activity Hazard Assessment Form (AHA)	
		Originating Organization: ARSEC Environmental	
		USACE Subcontract: W912P4-07-D-0009	
Job Description/Title: Tonawanda Landfill		Date of Analysis: October 8, 2009	
KEY PERSONNEL: Project Manager : ██████████ CQCM Manager: ██████████ SSHO: ██████████	Training Requirements: GET Medical Monitoring and Surveillance Requirements: HAZWOPER Medical Surveillance for Employees.		
Emergency Communication	440-953-6700 or 911		
Facilities Covered	Tonawanda Landfill		
Emergency Assembly Points	To be determined once on-site.		
Shelter-In-Place Locations	To be determined once on-site.		
Permits Required:	None		
Special Instructions	Preventive Measure: Prior to implementation, ARSEC will evaluate controls specified in applicable procedures to ensure that there are no conflicts and will STOP WORK if conflicts are found until the affected procedures are revised.		
	Radiological contamination: Radiological contamination is not anticipated.		
	Alarming dosimeter: No PRDI coverage required.		
	Fire patrols: N/A		
AHA Preface: ** ALL EMPLOYEES HAVE SUSPEND/STOP WORK AUTHORITY – All employees, are reminded that they have both the authority and responsibility to stop work when they perceive that an unsafe condition exists that threatens themselves, their coworkers, or the environment. Every employee has the right to a safe workplace, safe working conditions, and to understand the hazards of the workplace. ALL INJURIES, ILLNESSES, AND INCIDENTS MUST BE REPORTED TO THE SSHO IMMEDIATELY. See the Emergency Response Plan included in the Site Environment, Safety, and Health Plan. ALL PERSONNEL ARE ENCOURAGED TO ASK QUESTIONS AND OFFER SUGGESTIONS. Feedback on work methods, procedures, hazard controls, and preventative measures during all phases of work is essential to continuous improvement of work processes and is a part of the Integrated Safety Management System. Help us make your job easier and safer!			
Signature of ARSEC Environmental Safety and Health Manager:			Date:



Task/Activity	Hazards	Preventive Measures
General Activities	Unauthorized Personnel	<ul style="list-style-type: none"> Access to regulated areas is limited to personnel meeting the requirements for protective clothing and equipment, medical surveillance, training and respirator fitting as required. Site boundaries shall be established that outline the appropriate training and personal protection required to enter different areas of the project.
	Radiological Contamination	<ul style="list-style-type: none"> Potential radiological contamination is anticipated.
	Radiological Emergency	<ul style="list-style-type: none"> In the event of a radiological emergency, all personnel shall follow the instructions of the SSHO as given over the communications radios.
	Exposure to radiation and radioactive material	<ul style="list-style-type: none"> All workers who must perform work within a Radiological Area shall have at least a current Radiation Worker II training certificate. Smoking, chewing tobacco or gum, eating, drinking, or use of cosmetics is prohibited in radiological areas. HOLD POINT: If work is to be conducted in radiological areas, fixed contamination areas, or as determined by ARSEC RADCON, request a new RWP to address the hazard before continuing work (or equivalent). Personal protective equipment shall be specified in the Radiation Work Permit (RWP). Street clothes shall not be worn in contamination areas. A Radiation Work Permit is required for operations as determined by RADCON and area posting. All personnel shall follow requirements outlined in the RWP and the directions given by RADCON personnel. Personnel shall sign the RWP prior to each entry. Personnel shall record their entry and exit times on the RWP if a Direct Reading Dosimeter (DRDs) or electronic dosimeters are required for the project, or unless it is explicitly specified on the RWP. Personnel shall review the RWP prior to each entry to check for any changes to the RWP, check its expiration date, and obey all area postings Contact RADCON prior to digging regardless of depth. RADCON will evaluate the potential for ground contamination and need for additional controls Incoming and outgoing equipment will be subject to radiological survey
	Exposure to chemicals	<ul style="list-style-type: none"> All chemical products used in the performance of project completion shall have an MSDS on file, the appropriate PPE available, and Industrial Hygiene Monitoring based on the SSHO Representative recommendations. A copy of the Material Safety Data Sheet (MSDS) for each chemical onsite shall be present onsite and a copy will be submitted to USACE. An MSDS file shall be kept onsite so that personnel can review the MSDS at any time. During the AHA briefing, personnel shall be informed of the location of the MSDS files.



Task/Activity	Hazards	Preventive Measures
General Activities (cont'd)	Exposure to Lead Dust	<ul style="list-style-type: none"> Exposure to lead dust is not anticipated on this project.
	Events causing Injury/Illness and near miss events	<ul style="list-style-type: none"> Any event that results in an Injury/Illness shall be reported to the SSHO and Project Manager who in response shall perform an investigation and evaluation using ISMS principles and fundamentals to determine the cause and implement corrective measures, if needed, to prevent reoccurrence. Any small injury, even a First Aid, shall be reported to the SSHO.
	Slips, Trips and Falls	<ul style="list-style-type: none"> Determine the best access route before transporting equipment Basic housekeeping requirements shall apply to the job site. Continually inspect the work area for slip, trip and fall hazards and be aware of the changes in surfaces and conditions that may occur during demolition Dirt will be swept from walkways and paved areas for safety and good housekeeping
	Eye/Head/Foot injuries from work activities	<ul style="list-style-type: none"> Safety glasses meeting ANSI Z87.1 standards are required at all times in work areas. Dark safety glasses are not to be worn inside a building unless the area is well illuminated. Post flagging and signs around the area that say "Danger Overhead Hazard" as necessary. Hard hats with the brim facing forward are to be worn at all times. Safety shoes are required in all work areas with the exception of the office and break trailers.
	Injury due to stepping, lifting, and carrying	<ul style="list-style-type: none"> Do not step over barriers and boundary control tapes or ropes. Use a gate or make one. Stepping over is a trip hazard. Keep walkways clear of materials, scrap, and debris, Wear safety shoes with toe protection that are high enough to protect ankles. Do not wear worn-out shoes that need sole or heel replacement. Look, before you step to be sure you have a solid place to step. Do not step on materials, debris, or scrap. Do not jump over objects or obstructions. Go around. Do not jump off docks, other raised places, or steps. Do not carry over 50 pounds without assistance. Do not carry items that block your view. Use proper lifting techniques to prevent back injuries. Lift using the power of the legs and not the back. Stoop down, pull the load close to the trunk, and get up slowly.
	Events causing Injury/Illness and near miss events	<ul style="list-style-type: none"> Any event that results in an Injury/Illness shall be reported to the SSHO and Project Manager who in response shall perform an investigation and evaluation using sound safety principles and fundamentals to determine the cause and implement corrective measures, if needed, to prevent reoccurrence. ARSEC representatives will secure the scene of an accident and initiate the investigation process. Do not disturb the scene of the accident unless it is to mitigate further incident. Any small injury, even a First Aid, shall be reported to the SSHO.



Task/Activity	Hazards	Preventive Measures
General Activities (cont'd)	Injuries cause by improper manual material handling	<ul style="list-style-type: none"> Consider size, shape, and weight of object. Lifts >than 50 pounds require assistance or the aid of mechanical equipment. Use safe lifting techniques such as keeping back straight, feet planted for balance, bend at the knees, keep the load close and low to your body, lift smoothly, and do not twist. Do not lift a load that cannot be seen over. Gloves and the object should be free of dirt or grease that could prevent a firm grip. Always evaluate pinch hazards prior to handling material or any other activity that involves possible pinch point hazards Repetitive motion tasks will be evaluated for muscle strain potential and work planned accordingly.
	Hand Injuries (abrasions, cuts, lacerations, etc.)	<ul style="list-style-type: none"> Leather work gloves or equivalent glove as approved by the SSHO are to be worn at all times while handling rough material or equipment and tools that present hazards to hands. Be aware of the presence of protruding nails, jagged edges that are typically exposed on materials during demolition.
	Body fluid spill	<ul style="list-style-type: none"> Biohazard kit shall be onsite for use in the event of injury and the spillage of body fluids.
	Injury from falls	<ul style="list-style-type: none"> All work that is 6-feet above the floor, deck, or platform, requires 100% fall protection implementation and compliance. ARSEC Fall Protection training is required prior to use of Fall Protection devices. Do not do any work while sitting or standing on any surface that is six or more feet above the floor, deck, or landing below, without fall protection, unless the surface is an approved work surface protected by hand rails and kick boards. Inspect all fall protection equipment before each use and store fall protection equipment in a dry storage area, hanging up Do not leave fall protection equipment on the ground.
	Fall from ladder	<ul style="list-style-type: none"> All ladders shall be inspected prior to each use. When an employee finds damaged or broken ladder, he/she shall mark in some way so the ladder is not used again until it can be disposed for repair or from the work site Damaged or broken ladders shall not be used and they are to be marked by tape or tag and removed from service. Marked damaged and broken ladders are to be reported to the Project Manager and the SSHO. Secure, by tying off, extension ladders so that they do not slip during use. Use fall protection when >6' off the deck and on an extension ladder, unless the task only requires one hand and the other hand can be used to hold onto the ladder. If fall protection is not used, maintain three point contact with ladder. Be sure that an extension ladder is properly placed, one foot out at the base for every four feet of height. Be sure that the ladder extends three feet above any point of transfer on and off at the top of the ladder. Do not lean out to the side while working from an extension or step ladder Have an assistant hold any extension ladder that is not tied off until the ladder is tied off. Have an assistant while working from a step ladder if the task is not a short up and down. Do not stand on the last step and the top of a step ladder. Do not place any ladder in door or walkway without posting warnings in any direction required to warn oncoming traffic. Take all ladders down at shift end unless it is an extension ladder tied off and is to be used during the next shift. Store all ladders where they will not be damaged and will not cause a trip hazard



Task/Activity	Hazards	Preventive Measures
General Activities (cont'd)	Fire	<ul style="list-style-type: none"> • In case of fire, the fire department shall be notified immediately. • Fire extinguishers of the appropriate size and type shall be located at the demolition site. (20 lbs, multi-purpose ABC at points of fuel and flammable storage points). ARSEC shall provide and maintain these extinguishers. • When an employee finds damaged or broken fire extinguishers he/she shall mark it in some way so it is not used again until it can be disposed for repair or disposed from the work site. • Fuel not in a vehicle or motorized device, shall be in an approved metal fuel can with safety cap and flash arrestor. • Flammables are to be stored at least 50 feet away from a source of ignition or in a fireproof cabinet. • Smoking is allowed only in designated areas. • Personnel shall have "Hands On" training in the use of fire extinguishers as necessary.
	Fire caused by torch cutting, welding, and other spark generating activities	<ul style="list-style-type: none"> • No "hot work", such as torch cutting, welding, and other spark-generating activities are authorized under this AHA
	Electric Shock	<ul style="list-style-type: none"> • A Ground Fault Circuit Interrupter (GFCI) shall precede all connected extension cords and electric • No work shall occur on existing wiring without verification of deactivation • Personnel shall obtain an excavation permit when necessary. • Abandoned and active utilities (above and underground) shall be marked and identified with colors identifying status. • No excavating, digging, or air-hammer work shall take place unless that area has previously been surveyed for buried electrical utilities and an Excavation Penetration Permit has been obtained from USACE. • Any excavation in soil by air-hammer or excavator shall not be done until the equipment has been connected to an approved electrical ground. • A medical evaluation will be performed on anyone receiving an electrical shock
	Noise	<ul style="list-style-type: none"> • Potential high noise sources, e.g. generators, heavy equipment, etc, shall be identified. • Hearing protection shall be required where noise levels exceed 85dBA. Employees are to follow the ARSEC Hearing Conservation Program of the APP/SSHP.
	Unsafe equipment, tools, ladders, and electric cords	<ul style="list-style-type: none"> • Employees shall inspect all equipment tools, ladders, and electric cords prior to each use. • When an employee finds a defective and/or damaged item, he/she shall mark in some way so the item is not used again until it can be disposed for repair or disposed from the work site. • Electric cords shall be free of breaks, splices, or taped repairs or otherwise destroyed for disposal. • NO equipment is allowed to run over electrical cords • Use electric cord trees to route cords to the work area avoiding trafficking over the cord. No daisy-chaining of cords.
	Ergonomics-Repetitive Motion and Vibration Injury	<ul style="list-style-type: none"> • To reduce and/or eliminate cumulative trauma disorders personnel will be encouraged to find alternative methods for performing repetitive motion tasks such as change of position, using different hand positions, use of PPE, and using a support and good posture. • The use of job/task rotation may also be used to eliminate these hazards.



Task/Activity	Hazards	Preventive Measures
General Activities (cont'd)	Inadequate Illumination	<ul style="list-style-type: none"> • Additional lighting (i.e. portable lighting) shall be added as needed.
	Temperature Extremes	<ul style="list-style-type: none"> • Symptoms of heat/cold stress shall be stressed in toolbox meetings, pre-job activities, and work planning and personnel will be briefed in recognizing the signs and symptoms of heat stress and heat stroke. • Cool drinking water shall be made available. • Personnel are responsible to drink sufficient fluids. • Personnel shall be trained in Temperature Extreme Program.
	Weather	<ul style="list-style-type: none"> • All personnel shall observe weather conditions and warnings • The SSHO shall determine when workers need to take shelter away from the work site by being alert to changing and threatening weather conditions such as heavy rain, strong winds, and lightning. • The SSHO shall check with and follow advisories from the office of the USACE Site Superintendent.
	Pest Hazards	<ul style="list-style-type: none"> • Special precautions shall be taken for animals (checking areas to ensure area is clear of skunks, snakes, etc.). • The SSHO shall inform all personnel regarding the potential of pest hazards so that all personnel are aware of potential exposure to insect pests such as chiggers, ticks, mosquitoes, spiders, and bees/wasps • Insect repellent shall be available for all employees as needed • If bird or rodent droppings are present within a work area, personnel donning respiratory protection will remove the droppings by sweeping and place in a covered container.
	Hazards associated with Motorized Wheeled equipment onsite-combustion engines.	<ul style="list-style-type: none"> • All motorized-wheeled equipment is subject to radiological surveys prior to exit from the facility as determined by the appropriate radiological personnel. • All motorized-wheeled equipment is subject to safety inspections prior to entry into the site. • All motorized –wheeled equipment shall be in good repair without cooling, hydraulic, lubricant, and fuel leaks. • Only a qualified operator shall operate any motorized-wheeled equipment. • All mobile equipment (i.e. excavators, forklifts, etc.) shall have fire extinguishers mounted where they are readily accessible to the operator. • Extreme caution shall be taken when refueling vehicles and equipment • All motorized, wheeled work equipment shall have the required and properly inspected fire extinguishers. • Prior to initial operation for the day, all motorized-wheeled equipment and trucks over one ton capacity, shall be inspected daily using the Daily Equipment Operator Checklist that is signed by the operator. • When an employee finds damaged or broken motorized vehicle, he/she shall mark it in some way so the motorized vehicle is not used again until it can be disposed for repair or disposed from the work site • In the event, the operator finds any damage or problem, he/she shall inform the Project Manager and the SSHO. • Seat belts and other applicable operator restraints shall be worn at all times of operation. • A spotter will be used as needed when moving motorized equipment. • Truck drivers to inspect truck daily ensuring among other things brakes can be locked to stop the truck and tailgate latch and lights are working. Ensure dumps are on level ground before raising dump box.



Task/Activity	Hazard	Preventive Measures
General Activities (cont'd)	Hazards associated with Motorized Wheeled equipment onsite-combustion engines.	<ul style="list-style-type: none"> • No motorized equipment is allowed to enter a street that is not a part of the controlled work site unless a spotter is there to control traffic. • Where there is frequent utilization of a street adjacent to a work site, appropriate signs shall be used to warn traffic that normally uses the street. • Employees needing to use motorized equipment inside a building shall inform the Project Manager and the SSHO • The ARSEC SSHO shall ensure that internal combustion engines are not operated inside buildings unless there is periodic monitoring for carbon monoxide. • All stationary or small engine devices will have fire extinguishers located adjacent to the work area (within twenty feet). • No stationary or small engine device shall be fueled until it is turned off and allowed to cool. • No equipment is allowed to run over any electric or ground wire. • Truck drivers to inspect truck daily ensuring among other things brakes can be locked to stop the truck and tailgate latch and lights are working. Ensure dumps are on level ground before raising dump box.
	Untrained Operators	<ul style="list-style-type: none"> • Only qualified operators shall operate heavy equipment. • Proof of qualifications shall be documented and available for review.
	Activities involving work with or near electrical tools or equipment	<ul style="list-style-type: none"> • No work (such as changing blades) is allowed on any device, tool, conduit, or electrical cabinet, unless the device, tool, conduit, or cabinet, has been totally unplugged, been locked out under approved "Lock-Out-Tag-Out" procedure, or has been marked for removal after it has been completely isolated from any electrical power source.
	Electrical shock from unsafe or damaged electric tools, extension cords and other electric items use on the work site	<ul style="list-style-type: none"> • Portable electric tools and all cord and plug connected equipment shall be protected by a Ground Fault Circuit Interrupter (GFCI) device. • Any electrical item found with a defect shall be tagged with a DO NOT USE tag and the item shall be placed in a holding area until the item is removed from the work site. • Portable electric tools unsafe due to faulty plugs, damaged cords, or other reasons, shall be removed from service. • Tools shall be unplugged while servicing or changing blades/attachments. • Safety devices shall be functioning properly and cannot be modified. • The user prior to each use shall inspect electrical tools, portable hand tools and extension cords. • Electrical installation, repairs and maintenance shall be performed only by qualified individuals. • No daisy-chaining of extension cords. • Use electric cord trees to route cords to the work area avoiding trafficking over the cord. No daisy-chaining of cords



Task/Activity	Hazards	Preventive Measures
General Activities (cont'd)	Electric shock from unsafe extension cords.	<ul style="list-style-type: none"> • All extension cords shall be protected by GFCI device. • No extension cords shall put into service until it has an initial inspection. • Prior to each use employees are to inspect any extension cord for defects. • Extension cords, which have faulty plugs, damaged insulation, or are unsafe in any way, shall be removed from service; the employee finding a defective and/or damaged item shall identify it by taping or tagging as to why it is defective so the item is not used again until it can be disposed for repair or disposed from the work site. • Extension cords shall be protected from damage from sharp edges, projections, pinch points (doorways and walkways) and vehicular traffic. • Extension cord connectors shall be kept out of water • Extension cords shall be suspended only with a nonconductive support (rope, plastic ties, etc). No wire shall used to hang electrical cords. • No equipment is allowed to run over extension cords. • Any electric cord or drop that is in place more than one shift shall be hung above the floor traffic if in motorized vehicle traffic area.
	Electric shock due to use of unsafe Temporary Lighting	<ul style="list-style-type: none"> • Temporary lighting shall be used with a GFCI device. • Temporary lighting drops shall be inspected frequently for defects. • All bulbs on temporary lighting systems shall have a protective cage. • All light sockets shall be occupied. • All temporary lighting with more than one lamp shall be hung above floor traffic. • Any one lamp drop cord that is to remain after the end of one shift shall be hung above floor traffic.
	Fire caused by high temperature bulbs	<ul style="list-style-type: none"> • Portable/temporary quartz and halogen lighting fixtures can become extremely hot and should be secured and positioned so that contact with ordinary combustibles is prevented. • Lamps and light bulbs shall be covered by a protective shield or shroud. • Temporary light drops shall be kept up above floor traffic.
	Electric shock due to unsafe placement of extension cords and temporary lighting	<ul style="list-style-type: none"> • Temporary lighting shall be used with a GFCI device. • Extension cords shall be protected from damage from sharp edges and pinch points. • Any electric cord that goes through a door or wall shall be protected by a nonconductive sleeve. • Extension cords shall not be draped over conductive surfaces. • Extension cords and temporary lighting drops shall be suspended by nonconductive supports (rope, plastic, ties, etc). • Any cord that is to be left in place more than one shift is to be hung above floor traffic.



Task/Activity	Hazards	Preventive Measures
General Activities (cont'd)	Injury using hand tools and equipment	<ul style="list-style-type: none"> • Before each use, any hand tool or equipment shall be inspected for defects. • When an employee finds damaged or broken hand tools or equipment he/she shall mark in some way so the item is not used again until it can be disposed for repair or disposed from the work site • Marked damaged and broken tools are to be reported to the Project Manager and the SSHO. • Any instructions, manuals, or tags that come with specialized and unfamiliar equipment shall be given to the SSHO for placement in the onsite equipment tool record. • Specialized and unfamiliar equipment shall only be operated by a user that has reviewed and signed-off that they have read the equipment's operation manual. • Hand tools and equipment are to be used only for the use they were made to do. • Hand tools and equipment shall be used in a safe manner and with all manufacturers' supplied guards in place. • Ear protection shall be used with any hand tool or equipment that makes a noise at or greater than 85dBA. • All operators are required to use the required ear protection without being reminded. • All hand tools and equipment are to be picked up and stored in their proper storage places at the end of the shift. • All hand tools and equipment are to be kept out of walkways when not in direct use by the user. • Do not leave hand tools and equipment in walkways or where they are a snag or trip hazard. • Use gloves as required. • Do not cut remove any conduit or pipe unless it has been marked and approved for removal. • Report any injury that occurs while using hand tools or equipment, even a small injury, to the SSHO.
	Damage to equipment during erection of boundary controls	<ul style="list-style-type: none"> • Utilize the above stated preventive measures to prevent and control damage to equipment.
	Injury to the public and unauthorized individuals	<ul style="list-style-type: none"> • Post on site control barriers signs that warn and restrict unauthorized entry. • Utilize gates and keep them closed. • Replace any barrier that has been taken down for equipment entry or exit after the equipment has entered or exited. • Utilize ground personnel to control entry any time barriers are taken down unless otherwise authorized.
	Bodily injuries while establishing environmental controls	<ul style="list-style-type: none"> • Utilize the above stated preventive measures to prevent and control bodily injury. • Utilize proper lifting techniques as stated above



American Remediation Services and Environmental Corporation (ARSEC)
Tonawanda Landfill
Activity Hazard Analysis – Radiological Survey Activities

AHA-02
Revision 1
February 2010
Page 12 of 26

AHA Number 02 – Radiological Survey Activities		Activity Hazard Assessment Form (AHA)	
		Originating Organization: ARSEC Environmental	
		USACE Subcontract: W912P4-07-D-0009	
Job Description/Title: Tonawanda Landfill		Date of Analysis: October 8, 2009 (Preliminary Draft)	
KEY PERSONNEL: Project Manager : ██████████ CQCM: ██████████ SSHO: ██████████		Training Requirements: GET Medical Monitoring and Surveillance Requirements: HAZWOPER Medical Surveillance for Employees.	
Emergency Communication		440-953-6700 or 911	
Facilities Covered		Tonawanda Landfill	
Emergency Assembly Points		To be determined once on-site.	
Shelter-In-Place Locations		To be determined once on-site.	
Permits Required:		None	
Special Instructions		Preventive Measure: Prior to implementation, ARSEC will evaluate controls specified in applicable procedures to ensure that there are no conflicts and will STOP WORK if conflicts are found until the affected procedures are revised.	
		Radiological contamination: Radiological contamination is not anticipated.	
		Alarming dosimeter: No PRDI coverage required.	
		Fire patrols: N/A	
AHA Preface: ** ALL EMPLOYEES HAVE SUSPEND/STOP WORK AUTHORITY – All employees, are reminded that they have both the authority and responsibility to stop work when they perceive that an unsafe condition exists that threatens themselves, their coworkers, or the environment. Every employee has the right to a safe workplace, safe working conditions, and to understand the hazards of the workplace. ALL INJURIES, ILLNESSES, AND INCIDENTS MUST BE REPORTED TO THE SSHO IMMEDIATELY. See the Emergency Response Plan included in the Site Environment, Safety, and Health Plan. ALL PERSONNEL ARE ENCOURAGED TO ASK QUESTIONS AND OFFER SUGGESTIONS. Feedback on work methods, procedures, hazard controls, and preventative measures during all phases of work is essential to continuous improvement of work processes and is a part of the Integrated Safety Management System. Help us make your job easier and safer!			
Signature of Corporate Environmental Safety and Health Manager:			Date:



American Remediation Services and Environmental Corporation (ARSEC)
Tonawanda Landfill
Activity Hazard Analysis – Radiological Survey Activities

AHA-02
Revision 1
February 2010
Page 13 of 26

Task/Activity	Hazards	Preventive Measures
Perform radiological surveys of various outside areas. Areas will include soil investigation/drilling areas, areas in ditches/outfalls, open fields, and loose soil areas.	Unauthorized Personnel	<ul style="list-style-type: none"> Access to regulated areas is limited to personnel meeting the requirements for protective clothing and equipment, medical surveillance, training and respirator fitting as required. Site boundaries shall be established that outline the appropriate training and personal protection required to enter different areas of the project.
	Radiological Contamination	<ul style="list-style-type: none"> Potential radiological contamination is anticipated.
	Radiological Emergency	<ul style="list-style-type: none"> In the event of a radiological emergency, all personnel shall follow the instructions of the SSHA as given over the communications radios.
	Exposure to radiation and radioactive material	<ul style="list-style-type: none"> All workers who must perform work within a Radiological Area shall have at least a current Radiation Worker II training certificate. Smoking, chewing tobacco or gum, eating, drinking, or use of cosmetics is prohibited in radiological areas. HOLD POINT: If work is to be conducted in radiological areas, fixed contamination areas, or as determined by ARSEC RADCON, request a new RWP to address the hazard before continuing work (or equivalent). Personal protective equipment shall be specified in the Radiation Work Permit (RWP). Street clothes shall not be worn in contamination areas. A Radiation Work Permit is required for operations as determined by RADCON and area posting. All personnel shall follow requirements outlined in the RWP and the directions given by RADCON personnel. Personnel shall sign the RWP prior to each entry. Personnel shall record their entry and exit times on the RWP if a Direct Reading Dosimeter (DRDs) or electronic dosimeters are required for the project, or unless it is explicitly specified on the RWP. Personnel shall review the RWP prior to each entry to check for any changes to the RWP, check its expiration date, and obey all area postings Contact RADCON prior to digging regardless of depth. RADCON will evaluate the potential for ground contamination and need for additional controls Incoming and outgoing equipment will be subject to radiological survey
	Exposure to chemicals	<ul style="list-style-type: none"> All chemical products used in the performance of project completion shall have an MSDS on file, the appropriate PPE available, and Industrial Hygiene Monitoring based on the SSHA Representative recommendations. A copy of the Material Safety Data Sheet (MSDS) for each chemical onsite shall be present onsite and a copy will be submitted to USACE. An MSDS file shall be kept onsite so that personnel can review the MSDS at any time. During the AHA briefing, personnel shall be informed of the location of the MSDS files.
	Exposure to Lead Dust	<ul style="list-style-type: none"> Exposure to lead dust is not anticipated on this project.



Task/Activity	Hazards	Preventive Measures
Radiological Surveys (cont'd)	Events causing Injury/Illness and near miss events	<ul style="list-style-type: none"> Any event that results in an Injury/Illness shall be reported to the SSHO and Project Manager who in response shall perform an investigation and evaluation using ISMS principles and fundamentals to determine the cause and implement corrective measures, if needed, to prevent reoccurrence. Any small injury, even a First Aid, shall be reported to the SSHO.
	Slips, Trips and Falls	<ul style="list-style-type: none"> Determine the best access route before transporting equipment Basic housekeeping requirements shall apply to the job site. Continually inspect the work area for slip, trip and fall hazards and be aware of the changes in surfaces and conditions that may occur during demolition Dirt will be swept from walkways and paved areas for safety and good housekeeping
	Eye/Head/Foot injuries from work activities	<ul style="list-style-type: none"> Safety glasses meeting ANSI Z87.1 standards are required at all times in work areas. Dark safety glasses are not to be worn inside a building unless the area is well illuminated. Post flagging and signs around the area that say "Danger Overhead Hazard" as necessary. Hard hats with the brim facing forward are to be worn at all times. Safety shoes are required in all work areas with the exception of the office and break trailers.
	Injury due to stepping, lifting, and carrying	<ul style="list-style-type: none"> Do not step over barriers and boundary control tapes or ropes. Use a gate or make one. Stepping over is a trip hazard. Keep walkways clear of materials, scrap, and debris, Wear safety shoes with toe protection that are high enough to protect ankles. Do not wear worn-out shoes that need sole or heel replacement. Look, before you step to be sure you have a solid place to step. Do not step on materials, debris, or scrap. Do not jump over objects or obstructions. Go around. Do not jump off docks, other raised places, or steps. Do not carry over 50 pounds without assistance. Do not carry items that block your view. Use proper lifting techniques to prevent back injuries. Lift using the power of the legs and not the back. Stoop down, pull the load close to the trunk, and get up slowly.
	Events causing Injury/Illness and near miss events	<ul style="list-style-type: none"> Any event that results in an Injury/Illness shall be reported to the SSHO and Project Manager who in response shall perform an investigation and evaluation using sound safety principles and fundamentals to determine the cause and implement corrective measures, if needed, to prevent reoccurrence. ARSEC representatives will secure the scene of an accident and initiate the investigation process. Do not disturb the scene of the accident unless it is to mitigate further incident. Any small injury, even a First Aid, shall be reported to the SSHO.



American Remediation Services and Environmental Corporation (ARSEC)
 Tonawanda Landfill
 Activity Hazard Analysis – Radiological Survey Activities

AHA-02
 Revision 1
 February 2010
 Page 15 of 26

Task/Activity	Hazards	Preventive Measures
Radiological Surveys (cont'd)	Events causing Injury/Illness and near miss events	<ul style="list-style-type: none"> • Any event that results in an Injury/Illness shall be reported to the SSHO and Project Manager who in response shall perform an investigation and evaluation using sound safety principles and fundamentals to determine the cause and implement corrective measures, if needed, to prevent reoccurrence. • ARSEC representatives will secure the scene of an accident and initiate the investigation process. Do not disturb the scene of the accident unless it is to mitigate further incident. • Any small injury, even a First Aid, shall be reported to the SSHO.
	Injuries cause by improper manual material handling	<ul style="list-style-type: none"> • Consider size, shape, and weight of object. Lifts >than 50 pounds require assistance or the aid of mechanical equipment. • Use safe lifting techniques such as keeping back straight, feet planted for balance, bend at the knees, keep the load close and low to your body, lift smoothly, and do not twist. • Do not lift a load that cannot be seen over. • Gloves and the object should be free of dirt or grease that could prevent a firm grip. • Always evaluate pinch hazards prior to handling material or any other activity that involves possible pinch point hazards • Repetitive motion tasks will be evaluated for muscle strain. Work process and tools will be put in place as determined by the evaluation
	Hand Injuries (abrasions, cuts, lacerations, etc.)	<ul style="list-style-type: none"> • Leather work gloves or equivalent glove as approved by the SSHO are to be worn at all times while handling rough material or equipment and tools that present hazards to hands. • Be aware of the presence of protruding nails, jagged edges that are typically exposed on materials during demolition.
	Body fluid spill	<ul style="list-style-type: none"> • Biohazard kit shall be onsite for use in the event of injury and the spillage of body fluids. Designated rescue personnel shall have Bloodborne Pathogen Awareness training.
	Injury from falls	<ul style="list-style-type: none"> • All work that is 6-feet above the floor, deck, or platform, requires 100% fall protection implementation and compliance. • ARSEC Fall Protection training is required prior to use of Fall Protection devices. • Do not do any work while sitting or standing on any surface that is six or more feet above the floor, deck, or landing below, without fall protection, unless the surface is an approved work surface protected by hand rails and kick boards. • Inspect all fall protection equipment before each use and store fall protection equipment in a dry storage area, hanging up • Do not leave fall protection equipment on the ground.
	Fall from ladder	<ul style="list-style-type: none"> • All ladders shall be inspected prior to each use. • When an employee finds damaged or broken ladder, he/she shall mark in some way so the ladder is not used again until it can be disposed for repair or from the work site • Damaged or broken ladders shall not be used and they are to be marked by tape or tag and removed from service. • Marked damaged and broken ladders are to be reported to the Project Manager and the SSHO.



Task/Activity	Hazards	Preventive Measures
Radiological Surveys (cont'd)	Fall from ladder	<ul style="list-style-type: none"> • Secure, by tying off, extension ladders so that they do not slip during use. • Use fall protection when >6' off the deck and on an extension ladder, unless the task only requires one hand and the other hand can be used to hold onto the ladder. If fall protection is not used, maintain three point contact with ladder. • Be sure that an extension ladder is properly placed, one foot out at the base for every four feet of height. • Be sure that the ladder extends three feet above any point of transfer on and off at the top of the ladder. • Do not lean out to the side while working from an extension or step ladder • Have an assistant hold any extension ladder that is not tied off until the ladder is tied off. • Have an assistant while working from a step ladder if the task is not a short up and down. • Do not stand on the last step and the top of a step ladder. • Do not place any ladder in door or walkway without posting warnings in any direction required to warn oncoming traffic. • Take all ladders down at shift end unless it is an extension ladder tied off and is to be used during the next shift. • Store all ladders where they will not be damaged and will not cause a trip hazard
	Fire	<ul style="list-style-type: none"> • In case of fire, the fire department shall be notified immediately. • Fire extinguishers of the appropriate size and type shall be located at the demolition site. (20 lbs, multi-purpose ABC at points of fuel and flammable storage points). ARSEC shall provide and maintain these extinguishers. • When an employee finds damaged or broken fire extinguishers he/she shall mark it in some way so it is not used again until it can be disposed for repair or disposed from the work site. • Fuel not in a vehicle or motorized device, shall be in an approved metal fuel can with safety cap and flash arrestor. • Flammables are to be stored at least 50 feet away from a source of ignition or in a fireproof cabinet. • Smoking is allowed only in designated areas. • Personnel shall have "Hands On" training in the use of fire extinguishers as necessary.
	Noise	<ul style="list-style-type: none"> • Potential high noise sources, e.g. generators, heavy equipment, etc, shall be identified. • Hearing protection shall be required where noise levels exceed 85dBA. Employees are to follow the ARSEC Hearing Conservation Program of the APP/SSHP.
	Unsafe equipment, tools, ladders, and electric cords	<ul style="list-style-type: none"> • Employees shall inspect all equipment tools, ladders, and electric cords prior to each use. • When an employee finds a defective and/or damaged item, he/she shall mark in some way so the item is not used again until it can be disposed for repair or disposed from the work site. • Electric cords shall be free of breaks, splices, or taped repairs. Non-compliant cords shall be destroyed and disposed. • NO equipment is allowed to run over electrical cords • Use electric cord trees to route cords to the work area avoiding trafficking over the cord. No daisy-chaining of cords.



Task/Activity	Hazards	Preventive Measures
Radiological Surveys (cont'd)	Ergonomics-Repetitive Motion and Vibration Injury	<ul style="list-style-type: none"> To reduce and/or eliminate cumulative trauma disorders personnel will be encouraged to find alternative methods for performing repetitive motion tasks such as change of position, using different hand positions, use of PPE, and using a support and good posture. The use of job/task rotation may also be used to eliminate these hazards.
	Temperature Extremes	<ul style="list-style-type: none"> Symptoms of heat/cold stress shall be stressed in toolbox meetings, pre-job activities, and work planning and personnel will be briefed in recognizing the signs and symptoms of heat stress and heat stroke. Cool drinking water shall be made available. Personnel are responsible to drink sufficient fluids. Personnel shall be trained in Temperature Extreme Program.
	Weather	<ul style="list-style-type: none"> All personnel shall observe weather conditions and warnings The SSHO shall determine when workers need to take shelter away from the work site by being alert to changing and threatening weather conditions such as heavy rain, strong winds, and lightning. The SSHO shall check with and follow advisories from the office of the USACE Site Superintendent.
	Pest Hazards	<ul style="list-style-type: none"> Special precautions shall be taken for animals (checking areas to ensure area is clear of skunks, snakes, etc.). The SSHO shall inform all personnel regarding the potential of pest hazards so that all personnel are aware of potential exposure to insect pests such as chiggers, ticks, mosquitoes, spiders, and bees/wasps Insect repellent shall be available for all employees as needed If bird or rodent droppings are present within a work area, personnel donning respiratory protection will remove the droppings by sweeping and place in a covered container.
	Hazards associated with Motorized Wheeled equipment onsite-combustion engines.	<ul style="list-style-type: none"> All motorized-wheeled equipment is subject to radiological surveys prior to exit from the facility as determined by the appropriate radiological personnel. All motorized-wheeled equipment is subject to safety inspections prior to entry into the site. All motorized –wheeled equipment shall be in good repair without cooling, hydraulic, lubricant, and fuel leaks. Only a qualified operator shall operate any motorized-wheeled equipment. All mobile equipment (i.e. excavators, forklifts, etc.) shall have fire extinguishers mounted where they are readily accessible to the operator. Extreme caution shall be taken when refueling vehicles and equipment All motorized, wheeled work equipment shall have the required and properly inspected fire extinguishers. Prior to initial operation for the day, all motorized-wheeled equipment and trucks over one ton capacity, shall be inspected daily using the Daily Equipment Operator Checklist that is signed by the operator. When an employee finds damaged or broken motorized vehicle, he/she shall mark it in some way so the motorized vehicle is not used again until it can be disposed for repair or disposed from the work site In the event, the operator finds any damage or problem, he/she shall inform the Project Manager and the SSHO. Seat belts and other applicable operator restraints shall be worn at all times of operation.



Task/Activity	Hazards	Preventive Measures
Radiological Surveys (cont'd)	Hazards associated with Motorized Wheeled equipment onsite-combustion engines.	<ul style="list-style-type: none"> • A spotter will be used as needed when moving motorized equipment. • Truck drivers to inspect truck daily ensuring among other things brakes can be locked to stop the truck and tailgate latch and lights are working. Ensure dumps are on level ground before raising dump box. No motorized equipment is allowed to enter a street that is not a part of the controlled work site unless a spotter is there to control traffic. • Where there is frequent utilization of a street adjacent to a work site, appropriate signs shall be used to warn traffic that normally uses the street. • Employees needing to use motorized equipment inside a building shall inform the Project Manager and the SSHO • The ARSEC SSHO shall ensure that internal combustion engines are not operated inside buildings unless there is periodic monitoring for carbon monoxide. • All stationary or small engine devices will have fire extinguishers located adjacent to the work area (within twenty feet). • No stationary or small engine device shall be fueled until it is turned off and allowed to cool. • No equipment is allowed to run over any electric or ground wire. • Truck drivers to inspect truck daily ensuring among other things brakes can be locked to stop the truck and tailgate latch and lights are working. Ensure dumps are on level ground before raising dump box.
	Actives involving work with or near electrical tools or equipment	<ul style="list-style-type: none"> • No work (such as changing blades) is allowed on any device, tool, conduit, or electrical cabinet, unless the device, tool, conduit, or cabinet, has been totally unplugged, been locked out under approved "Lock-Out-Tag-Out" procedure, or has been marked for removal after it has been completely isolated from any electrical power source.
	Electric shock due to unsafe placement of extension cords	<ul style="list-style-type: none"> • Temporary lighting shall be used with a GFCI device. • Extension cords shall be protected from damage from sharp edges and pinch points. • Any electric cord that goes through a door or wall shall be protected by a nonconductive sleeve. • Extension cords shall not be draped over conductive surfaces. • Extension cords and temporary lighting drops shall be suspended with nonconductive supports (rope, plastic, ties, etc). • Any cord that is to be left in place more than one shift is to be hung above floor traffic.
	Bodily injuries while establishing environmental perimeter air monitoring stations	<ul style="list-style-type: none"> • Utilize the above stated preventive measures to prevent and control bodily injury. • Utilize proper lifting techniques as stated above



Task/Activity	Hazards	Preventive Measures
Radiological Surveys (cont'd)	Injury using hand tools and equipment	<ul style="list-style-type: none">• Before each use, any hand tool or equipment shall be inspected for defects.• When an employee finds damaged or broken hand tools or equipment he/she shall mark in some way so the item is not used again until it can be disposed for repair or disposed from the work site• Marked damaged and broken tools are to be reported to the Project Manager and the SSHO.• Any instructions, manuals, or tags that come with specialized and unfamiliar equipment shall be given to the SSHO for placement in the onsite equipment tool record.• Specialized and unfamiliar equipment shall only be operated by a user that has reviewed and signed-off that they have read the equipment's operation manual.• Hand tools and equipment are to be used only for the use they were made to do.• Hand tools and equipment shall be used in a safe manner and with all manufacturers' supplied guards in place.• Ear protection shall be used with any hand tool or equipment that makes a noise at or greater than 85dBA.• All operators are required to use the required ear protection without being reminded.• All hand tools and equipment are to be picked up and stored in their proper storage places at the end of the shift.• All hand tools and equipment are to be kept out of walkways when not in direct use by the user.• Do not leave hand tools and equipment in walkways or where they are a snag or trip hazard.• Use gloves as required.• Do not cut remove any conduit or pipe unless it has been marked and approved for removal.• Report any injury that occurs while using hand tools or equipment, even a small injury, to the SSHO.



American Remediation Services and Environmental Corporation (ARSEC)
 Tonawanda Landfill
 Activity Hazard Analysis – Check Source Handling and Use

AHA-03
 Revision 1
 February 2010
 Page 21 of 26

AHA Number 03 – Check Source Handling and Use		Activity Hazard Assessment Form (AHA)	
		Originating Organization: ARSEC Environmental	
		USACE Subcontract: W912P4-07-D-0009	
Job Description/Title: Tonawanda Landfill		Date of Analysis: October 8, 2009 (Preliminary Draft)	
KEY PERSONNEL: Project Manager : R. Steven Shirley FSS Manager: Penny Baxter SSHO: Randy McCrone		Training Requirements: GET, Rad Worker II Equivalent Medical Monitoring and Surveillance Requirements: HAZWOPER Medical Surveillance for Employees.	
Emergency Communication		724-842-3141 or 911	
Facilities Covered		Tonawanda Landfill	
Emergency Assembly Points		To be determined once on-site.	
Shelter-In-Place Locations		To be determined once on-site.	
Permits Required:		None	
Special Instructions		Preventive Measure: Prior to implementation, ARSEC will evaluate controls specified in applicable procedures to ensure that there are no conflicts and will STOP WORK if conflicts are found until the affected procedures are revised.	
		Radiological contamination: Radiological contamination is not anticipated.	
		Alarming dosimeter: No PRDI coverage required.	
		Fire patrols: N/A	
AHA Preface: ** ALL EMPLOYEES HAVE SUSPEND/STOP WORK AUTHORITY – All employees, are reminded that they have both the authority and responsibility to stop work when they perceive that an unsafe condition exists that threatens themselves, their coworkers, or the environment. Every employee has the right to a safe workplace, safe working conditions, and to understand the hazards of the workplace. ALL INJURIES, ILLNESSES, AND INCIDENTS MUST BE REPORTED TO THE SSHO IMMEDIATELY. See the Emergency Response Plan included in the Site Environment, Safety, and Health Plan. ALL PERSONNEL ARE ENCOURAGED TO ASK QUESTIONS AND OFFER SUGGESTIONS. Feedback on work methods, procedures, hazard controls, and preventative measures during all phases of work is essential to continuous improvement of work processes and is a part of the Integrated Safety Management System. Help us make your job easier and safer!			
Signature of Corporate Environmental Safety and Health Manager:			Date:



Task/Activity	Hazards	Preventive Measures
Perform Lab Work and/or Source Handling Activities <ul style="list-style-type: none"> • Calibrating instruments • Counting smears and air samples • Performing instrument maintenance 	Radioactive Materials Area	<ul style="list-style-type: none"> • Follow requirements of all signs and postings. • Follow requirements of RWP. • Refer to applicable RWP for PPE requirements. • Area where smears and air samples are counted should be surveyed after use to ensure it is left as non-contaminated. • Practice good housekeeping and radiological controls in work area.
	Source Control	<ul style="list-style-type: none"> • Ensure all sources used are placed back in their designated storage location when work is complete. Never leave sources un-attended when in use. If taking source(s) from their storage location, user shall sign source in/out.
	Slip/Trip Hazards	<ul style="list-style-type: none"> • Ensure area is free of trip and slip hazards. • Practice good housekeeping in lab or work area.
	Electrical Hazards	<ul style="list-style-type: none"> • Ensure instrumentation is unplugged prior to performing any intrusive maintenance
	Flammable Materials	<ul style="list-style-type: none"> • Ensure all flammable material is stored in the Flammable Material Cabinet when not in use. • Do not use flammable materials near any ignition source. • Refer to MSDS for additional handling, disposal, and spill cleanup information.
	Compressed Gas Cylinders	<ul style="list-style-type: none"> • Ensure all compressed gas cylinders are stored in a designated area, in an upright position, properly secured, with caps on (when not in use).



American Remediation Services and Environmental Corporation (ARSEC)
Tonawanda Landfill
Activity Hazard Analysis – Soil Drilling

AHA-04
Revision 1
February 2010
Page 24 of 26

AHA Number 04 – Soil Drilling		Activity Hazard Assessment Form (AHA)	
		Originating Organization: ARSEC Environmental	
		USACE Subcontract: W912P4-07-D-0009	
Job Description/Title: Tonawanda Landfill		Date of Analysis: October 8, 2009 (Preliminary Draft)	
KEY PERSONNEL: Project Manager : R. Steven Shirley FSS Manager: Penny Baxter SSHO: Randy McCrone	Training Requirements: GET Medical Monitoring and Surveillance Requirements: HAZWOPER Medical Surveillance for Employees.		
Emergency Communication	724-842-3141 or 911		
Facilities Covered	Tonawanda Landfill		
Emergency Assembly Points	To be determined once on-site.		
Shelter-In-Place Locations	To be determined once on-site.		
Permits Required:	None		
Special Instructions	Preventive Measure: Prior to implementation, ARSEC will evaluate controls specified in applicable procedures to ensure that there are no conflicts and will STOP WORK if conflicts are found until the affected procedures are revised.		
	Radiological contamination: Radiological contamination is not anticipated.		
	Alarming dosimeter: No PRDI coverage required.		
	Fire patrols: N/A		
AHA Preface: ** ALL EMPLOYEES HAVE SUSPEND/STOP WORK AUTHORITY – All employees, are reminded that they have both the authority and responsibility to stop work when they perceive that an unsafe condition exists that threatens themselves, their coworkers, or the environment. Every employee has the right to a safe workplace, safe working conditions, and to understand the hazards of the workplace. ALL INJURIES, ILLNESSES, AND INCIDENTS MUST BE REPORTED TO THE SSHO IMMEDIATELY. See the Emergency Response Plan included in the Site Environment, Safety, and Health Plan. ALL PERSONNEL ARE ENCOURAGED TO ASK QUESTIONS AND OFFER SUGGESTIONS. Feedback on work methods, procedures, hazard controls, and preventative measures during all phases of work is essential to continuous improvement of work processes and is a part of the Integrated Safety Management System. Help us make your job easier and safer!			
Signature of Corporate Environmental Safety and Health Manager:			Date:



Task	Hazards	Preventive Measures
Core Drill Operation	<ul style="list-style-type: none"> • Core Drill Slipping from Position, Mis-Drilling • Contact with proximal and/or energized utilities • Cords, plugs damaged on electrical drill • Electrocutation • Operator Error • Dust Generation 	<ul style="list-style-type: none"> • Roll the drill so that the spindle is positioned over desired drilling location • Level the core drill appropriately using the leveling screws • Engage hold-down safely requiring the surface intended for drilling be as smooth and even as possible. • Utility drawings shall be retained at the jobsite to aid in identification of utility line(s) • Stop work immediately if there are unknown utilities or a utility is found to be marked in the wrong location. • Electrical components of drills to include cords, plugs, etc. shall be inspected prior to use for splices, cuts to mitigate potential for electric shock • As water is required for core drilling, core drill operators/spotters of activity shall verify that electric components of core drill shall remain dry to the greatest extent possible • Ground areas along the fence line, ditch and residential areas where drilling will take place will be wetted to prevent dust generation.
Drilling Technique	<ul style="list-style-type: none"> • Injuries from Inadvertent Drill Movement • Struck-by abrasive fines • Drill Seizure; Struck-by drill • Unanticipated utilities within material being drilled • Exposure to chemicals or other toxins 	<ul style="list-style-type: none"> • Inspect core drill prior to use. • Leather gloves shall be worn to mitigate the potential for hand injury • Instructions for core drill use must be kept at the jobsite and reviewed prior to use • Secure the core drill to working surface verifying that there is no movement that could allow drill to bind in the hole • Insure hole is constantly flushed of abrasive fines by supplying a sufficient flow of water • DO NOT force bit into material. Exert steady downward pressure while drilling • Do not stop the flow of water or rotation of the bit while the core bit is drilling • Check the core bit for reconditioning if the drilling rate decreases noticeably. • Use drawings/plans to verify no utilities lay beneath area of drilling such as conduit, pipes, etc. • STOP WORK to re-evaluate controls should operator of core drill encounters an anomaly within substance being drilled • Monitor drilling operations with a PID and quad-gas meter
Using Core Drill within Excavations	<ul style="list-style-type: none"> • Personnel uninformed of excavation hazards • Trench collapse • Uncontrolled core removal; Struck-by core 	<ul style="list-style-type: none"> • Review the excavation permit for requirements • Follow restrictions on permit • Stop work immediately if there are unknown utilities or a utility is found to be marked in the wrong location. • Stop work immediately for unexpected or changed soil or subsurface conditions • Employees/pedestrians shall not be located on opposite side of structures where horizontal core drilling is conducted to mitigate struck-by potential • If atmospheric (4-gas) testing has been conducted in excavations, such monitoring shall precede any activities within that excavation using a core drill.

APPENDIX E

Radiation Safety Plan for the Phase 2 Remedial Investigation of the Tonawanda Landfill Operable Unit, Tonawanda, New York

The remainder of this page intentionally left blank

**Radiation Safety Plan for the Phase 2
Remedial Investigation of the Tonawanda
Landfill Operable Unit, Tonawanda, New
York**

**Buffalo District
Formerly Utilized Sites Remedial Action Program**

**Prepared by:
American Remediation Solutions and Environmental Corporation (ARSEC)
2609 North River Road
Port Allen, LA 70767**



**For:
U.S. Army Corps of Engineers – Buffalo District
Formerly Utilized Sites Remedial Action Program
Contract No. W912P4-07-D-0009, Delivery Order 0003**

February 2010, Revision 1

TABLE OF CONTENTS

ACRONYMS III

1.0 BACKGROUND AND PURPOSE 1

2.0 SCOPE OF THE RADIATION SAFETY PLAN (RSP)..... 1

3.0 REGULATORY REQUIREMENTS 1

 3.1 ARSEC REGULATORY COMMITMENT 2

4.0 INTERNAL REVIEWS..... 2

 4.1 ARSEC CORPORATE PROGRAM 2

5.0 RESPONSIBILITIES AND AUTHORITIES..... 2

 5.1 ARSEC SENIOR MANAGEMENT 2

 5.2 ARSEC RADIATION SAFETY OFFICER (RSO)..... 2

 5.3 ARSEC SITE RADIATION SAFETY OFFICER (SRSO)..... 3

 5.4 ARSEC PROJECT MANAGER (PM) 3

 5.5 HEALTH PHYSICS TECHNICIANS (HPTS)..... 3

6.0 ALARA PROVISION 4

7.0 OCCUPATIONAL RADIATION EXPOSURE LIMITS..... 4

 7.1 ADULT EMPLOYEES 5

 7.2 EMBRYO/FETUS 5

 7.3 RADIATION EXPOSURE TO MINORS 5

 7.4 EXPOSURE TO VISITORS AND MEMBERS OF THE PUBLIC..... 5

8.0 SURVEYS AND MONITORING 5

 8.1 RADIOLOGICAL SURVEYS 6

 8.2 DOSE RATE SURVEYS 7

 8.3 CONTAMINATION SURVEYS 7

 8.4 RADIOLOGICAL AIR MONITORING 9

 8.5 AIR SAMPLE ANALYSES 9

 8.6 OPERATIONAL ACTION LEVELS 10

 8.7 PRELIMINARY WALKOVER SURVEY 11

 8.8 ESTABLISHMENT OF CONTROL ZONES 11

 8.9 ROUTINE RADIATION AND CONTAMINATION SURVEYS 12

9.0 TRAINING 12

10.0 WORK SUPPORT ACTIVITIES..... 12

 10.1 ENGINEERING CONTROLS 12

 10.2 POSTING REQUIREMENTS..... 12

 10.3 CONTROL OF RADIOACTIVE MATERIALS 13

 10.4 STORAGE AND INVENTORY 13

 10.5 INSTRUMENTATION..... 13

 10.6 RECORDS 14

 10.8 REPORTS TO INDIVIDUALS 14

 10.9 REPORTS TO EMPLOYERS (NON-ARSEC)..... 14

LIST OF TABLES AND FIGURES

TABLE 8-1. ACCEPTABLE SURFACE CONTAMINATION LEVELS (EM 385-1-80).....6
TABLE 8-2. OPERATIONAL ACTION LEVELS10

ACRONYMS

APP	Accident Prevention Plan
ARSEC	American Remediation Solutions and Environmental Corporation
ALARA	as low as reasonably achievable
CD	compact disc
CDE	committed dose equivalent
CEDE	committed effective dose equivalent
CFR	Code of Federal Regulations
COC	contaminant of concern
CRZ	Contamination Reduction Zone
cm	centimeter
cm ²	square centimeter
DAC	Derived Air Concentration
DCGL	Derived Concentration Guideline Level
DDE	deep dose equivalent
dpm	disintegrations per minute
EPA	U.S. Environmental Protection Agency
EM	Engineer Manual
H&S	Health and Safety
HP	health physicist
HPT	Health Physics Technician
HSP	Health and Safety Plan
MARSSIM	Multi-Agency Radiation Survey and Site Investigation Manual
MDA	minimum detectable activity
MDC	minimal detectable concentration
mrem	millirem
NESHAPS	National Emission Standards for Hazardous Air Pollutants
NIST	National Institute of Standards and Technology
NRC	U.S. Nuclear Regulatory Commission
OU	Operable Unit
OSHA	Occupational Safety and Health Administration
pCi/g	picoCuries per gram
PM	Project Manager
PPE	personal protective equipment
ppm	parts per million
QA	quality assurance
QC	quality control
RP	Radiation Protection
RPT	Radiation Protection Technician
RWP	Radiation Work Permits
RSP	Radiation Safety Plan
SAF	self absorption factor
SOP	standard operating procedure
SOP	standard operating procedure
SRSO	Site Radiation Safety Officer
SSHO	Site Safety and Health Officer
TEDE	total effective dose equivalent

TLD thermoluminescent dosimeter
USACE U.S. Army Corps of Engineers

1.0 BACKGROUND AND PURPOSE

This Radiation Safety Plan (RSP) presents procedures American Remediation Solutions and Environmental (ARSEC) personnel and subcontractors will follow in performing work activities at the Tonawanda Landfill Operable Unit (OU) Phase 1 Remedial Investigation. ARSEC is responsible solely for compliance with the provisions of this RSP by ARSEC employees and other designated personnel under the direct supervision of ARSEC management. Personnel supervised by organizations other than ARSEC must adhere to an approved radiation safety program prepared and administered by that organization.

ARSEC will provide continuous health physics coverage for all work activities performed during the investigation. ARSEC will implement a radiation safety program to protect the radiological health and safety of field remediation personnel during this project. The RSP describes the project-specific radiation safety program and is presented below.

2.0 SCOPE OF THE RADIATION SAFETY PLAN (RSP)

Radiation and radioactive materials are defined as workplace, as well as environmental, hazards. Worker protection requirements for exposure to radiation and/or radioactive materials are defined in federal regulations

This RSP defines the worker protection requirements for radiation exposure control as a support document of the Accident Prevention Plan/Health and Safety Plan (APP/HSP). This plan provides the template for lower tier procedures developed and implemented as project Radiation Protection (RP) Standard Operating Procedures (SOPs) that are commensurate with the scope and extent of the radiation hazards associated with Tonawanda Landfill activities and are sufficient to ensure compliance with the applicable regulatory requirements. This RSP outlines the functions and responsibilities of the radiological support group and describes the work to be performed at the Tonawanda Landfill site by ARSEC personnel.

3.0 REGULATORY REQUIREMENTS

This RSP has been developed and the field activities described herein will be performed in accordance with the following documents:

- The ARSEC *Environment, Safety and Health Program Plan*, (ARSEC, 2007), a copy of which is included in electronic (Compact Disc [CD]) format as Appendix B.
- U.S. Army Corps of Engineers (USACE) Engineer Manual (EM) 385-1-1, *Safety and Health Requirements Manual*, (USACE, 2008).
- USACE EM 385-1-92, *Safety and Occupational Health, Requirements for Hazardous, Toxic and Radioactive Waste Activities*, (USACE, 2007).
- USACE EM 385-1-80, *Radiation Protection Manual*, (USACE 1997).
- USACE ER 385-1-80, *Radiation Safety*, (USACE 1997).
- US Department of Labor, Occupational Safety and Health Administration (OSHA), Chapter 29, Sections 1910.120 and 1926 of the Code of Federal Regulations (29 CFR 1910.120 and 1926).
- USEPA 10CFR61, *National Emissions Standards for Hazardous Air Pollutants* (NESHAP)

3.1 ARSEC Regulatory Commitment

The radiation protection program defined by this plan is based on satisfying the applicable requirements of federal and state regulatory agencies. Tonawanda Landfill activities shall comply with this plan and the specific requirements of regulations applicable to Tonawanda Landfill.

4.0 INTERNAL REVIEWS

4.1 ARSEC Corporate Program

The ARSEC Corporate Health and Safety H&S staff shall review the radiation safety program defined by this plan on a routine basis. This review shall evaluate the program requirements against applicable requirements of governing federal and state regulations. Upon a satisfactory finding that the program requirements are in compliance, the program content and implementation shall be reviewed for compliance with program requirements. These two review elements may be conducted individually or concurrently. The results of these reviews shall be documented in writing for senior ARSEC management attention and review. Any action items identified by this review shall be assigned to a responsible individual along with a required response and completion date.

All review documentation and associated action items shall be maintained in the radiation protection records system available for review and/or audit by applicable regulatory authorities.

5.0 RESPONSIBILITIES AND AUTHORITIES

5.1 ARSEC Senior Management

Senior Management is responsible for providing the commitment and the resources necessary to support the development and implementation of a radiation protection program that shall provide assurance that ARSEC employees and individuals employed under an ARSEC radiological control program are protected from unnecessary exposure to radiation. ARSEC senior management shall emphasize and delegate this commitment to the ARSEC Tonawanda Landfill PM responsible for associated ARSEC activities. ARSEC senior management is ultimately responsible for regulatory compliance of all ARSEC activities involving actual or potential exposures to radiation and/or radioactive materials.

5.2 ARSEC Radiation Safety Officer (RSO)

The Corporate Radiation Safety Officer (RSO) is responsible for the development, implementation, and maintenance of the ARSEC Corporate RSP. The RSO is responsible for ensuring that the Corporate RSP is in compliance with applicable federal requirements as defined in this RSP. Specifically, the RSO is responsible for ensuring that the records management requirements of this plan are compatible with corporate activities as well as ARSEC project activities. The RSO shall conduct periodic reviews to ensure program content and implementation to satisfy applicable regulatory requirements.

Additional responsibilities of the RSO are as follows:

- Ensures that an approved RSP has been established that satisfies applicable regulatory and ARSEC Corporate RSP requirements.
- Ensures that dose assessments are completed and that the applicable or appropriate analytical protocols were applied for completing an exposed individual's dose record.
- Ensures that all radiation exposure reports are produced and provided to the individual and to the governing regulatory agency in accordance with requirements of that agency.

5.3 ARSEC Site Radiation Safety Officer (SRSO)

Under the direction of the ARSEC RSO, the SRSO will be responsible for the implementation of this RSP. The SRSO will:

- Have oversight of all radiation safety activities and operations relating to radioactive sampling, radioactive sample analysis, site radioactive surveys, and handling and packaging of radioactive materials, waste management, and associated operations.
- Assure that environmental monitoring addresses the site-specific emissions providing clear and accurate documentation of compliance, and that all personnel are adequately trained in radiation safety principles commensurate to the level with each person's job function.
- Correct any work practices and/or conditions that may result in unnecessary exposure to radioactive materials.
- Lead the regulatory interface for all matters of radiation safety and/or radioactive waste management.
- Be involved in the project work planning of all operations in contaminated areas.
- Perform site radiation safety audits.
- Consult with the RSO about any deficiencies involving project radiation safety and oversee personnel assigned to Radiation Protection Personnel.

5.4 ARSEC Project Manager (PM)

The ARSEC PM is responsible for ensuring that work activities—conducted under his/her direction involving exposure of individuals to radiation and/or radioactive materials—are performed in accordance with this RSP commensurate with the radiation hazards involved. The PM is responsible for ensuring that the project's radiation protection staff and supporting resources are adequate for implementing the radiological control and monitoring requirements of this Plan. The PM is responsible for providing the support resources necessary for implementing and maintaining the exposure control records system that satisfies the regulatory requirements governing this work and is compatible with the ARSEC Corporate Records Management System.

5.5 Health Physics Technicians (HPTs)

HPTs will report to the SRSO. The HPTs will:

- Develop Radiation Work Permits (RWP),
- Perform RSP briefing of personnel and ensure implementation requirements,
- Perform quality control checks and operability checks of the instrumentation used,
- Perform all routine radiation, contamination, and airborne monitoring surveys,
- Control the access of tools, personnel and equipment into and out of the Exclusion Zone, including surveys for unconditional release,
- Perform all radiation surveys
- Perform all radiation and contamination surveys for radioactive waste,
- Perform any personnel decontamination as needed,
- Maintain and post all radiological signs and barriers,
- Consult with the SRSO pertaining to any deficiencies involving project radiation safety,
- Escort all visitors and inspectors that are allowed access into the Exclusion Zone and Radiologically posted areas.

6.0 ALARA PROVISION

Work control for Tonawanda Landfill radiological activities shall be performed in accordance with the requirements of this plan and shall incorporate provisions for reducing radiological exposures to “as low as reasonably achievable” (ALARA). The activity work control shall include a formal plan and subsequent implementation of procedures and engineering controls that reduce the exposure of the individual to the radiological environment. Process or other engineering controls are the preferred methods for maintaining exposures to radiation and radioactive materials ALARA.

Controls that are evaluated for inclusion into the work control include the following:

- Control of access to the radioactive sources
- Techniques to reduce exposure times
- Techniques to increase distance between the individual and the source
- Use of personal protective equipment (PPE)
- Before implementation, any procedure and control considered for ALARA purposes shall be evaluated to ensure the following:
 - Cost associated with implementation is justifiable
 - Implementation results in an overall risk reduction and not simply a risk transference
 - The overall risk reduction is justifiable in the context of overall task or project objectives

ALARA plans and procedures for the Tonawanda Landfill shall be maintained with project radiation safety documentation and may be reviewed by USACE and the ARSEC Corporate Health and Safety (H&S) staff upon request.

The Contract Administrative and ALARA Control Limits [in units of rem] are as follows:

Dose Quantity	10 CFR 20	Contract ACL	ALARA ACL
TEDE	5	0.5	0.1
CDE	50	5	0.5
LDE	15	1.5	1.5
SDE	50	5	0.5
Embryo/Fetus	0.5	.5	NA

7.0 OCCUPATIONAL RADIATION EXPOSURE LIMITS

The radiation exposure to Tonawanda Landfill personnel accessing radiologically controlled areas shall be controlled to ensure that the following limits are not exceeded for all work that the worker is assigned. These limits are consistent with federal regulations that are applicable to Tonawanda Landfill work activities involving exposure or potential exposure to radiation and/or radioactive materials and are the maximum allowed, with approval of the ARSEC RSO.

7.1 Adult Employees

Total Effective Dose Equivalent	(TEDE = DDE + CEDE)	5.0 rem/yr
Total Organ Dose Equivalent to Maximum exposed organ	(TODE = DDE + CDE)	50.0 rem/yr
Lens of Eye Dose Equivalent	(LDE)	15.0 rem/yr
Shallow Dose Equivalent to Skin or extremity	(SDE)	50.0 rem/yr

Where:

DDE = Deep dose equivalent (i.e., whole body exposure to external penetrating radiation)

CEDE = Committed effective dose equivalent (e.g., internal exposure from inhalation, ingestion, injury)

CDE = Committed dose equivalent

7.2 Embryo/Fetus

In the event that a Tonawanda Landfill worker declares herself pregnant, that worker's task assignments shall be controlled to limit the radiation exposure to the embryo/fetus. That limit shall be based on the time from conception to birth.

Dose equivalent limit to embryo/fetus: 0.5 rem for entire pregnancy

7.3 Radiation Exposure to Minors

The Tonawanda Landfill Project does not employ minor individuals (individuals less than 18 years old) to perform work in a radiation environment.

7.4 Exposure to Visitors and Members of the Public

Members of the public may receive radiation exposure from the Tonawanda Landfill Project controlled and/or monitored activities either as visitors onsite or by occupancy adjacent to the site. A visitor may be a member of the public or may be a representative or employee of a company or agency performing work onsite.

Radiation exposure to the public from air particulate emission shall be controlled to limit doses to:

<0.10 rem/yr

Radiation exposure to visitors onsite or individuals offsite shall be controlled to limit doses to:

TEDE < 0.10 rem/yr

Additionally, the EPA sets an offsite dose limit via air particulate emissions of:

0.01 rem/yr

8.0 SURVEYS AND MONITORING

The HPTs will perform routine monitoring during all aspects of the work at the Tonawanda Landfill site. Routine radiation/contamination surveys will be conducted in order to control the potential spread of contamination from controlled areas to uncontrolled areas. Gamma survey will be conducted as

needed at perimeters of Exclusion Zones. Contamination Reduction Zones (CRZs) will be surveyed for contamination as necessary to ensure the area is kept free of radioactive contamination. Release surveys will be conducted in accordance with this Tonawanda Landfill RSP. Contamination surveys will be conducted of all radiologically posted areas as necessary to track the potential for changing conditions based upon job functions being conducted in the area. Radiation and contamination surveys will be conducted and documented in accordance with this RSP. All radiation/contamination/air monitoring survey data and surveys will be reviewed by the PM.

Air monitoring will be conducted at the perimeter of the site. Low-volume air samplers will be used for collection of airborne radioactive particulate contamination. Additionally, personal air samples may be used to monitor individual breathing zones for various job tasks being performed. General area air samples will be conducted during some work operations, as deemed appropriate by the PM and/or during operations where respirator protection is not required. Four perimeter samples will be taken during activities that create the greatest potential for airborne release and will be analyzed on site at least weekly using a low background proportional counter. General area and breathing zone airborne monitoring will be conducted during decontamination operations as necessary. Air sampling analysis and DAC-hour tracking will be performed in accordance with this RSP.

Radioactive materials and wastes will be generated and handled as part of the job scope for work activities. Radioactive material and waste handling will be conducted under the direction of the PM and supporting HPTs in accordance with this RSP.

8.1 Radiological Surveys

Radiological surveys, such as contamination and airborne radioactivity surveys will be performed to evaluate radiological conditions and verify that radiological work activities are being adequately controlled. Survey data will be used for the Radiation Work Permit development, job evaluations, environmental reporting, and trend analysis, ALARA planning and informing personnel of radiological conditions. Survey results will be made available to workers entering radiologically Restricted Areas.

Several instruments are routinely used for scanning and frisking, and smear counting. The selected instruments will be used by qualified technicians at proper distances, scan speeds, and count times to ensure that the detection limits of those instruments are less than the acceptable surface contamination levels identified in Table 1.

Nuclide ^a	Average dpm/100 cm ²	Maximum dpm/100 cm ²	Removable dpm/100 cm ²
U-nat, U ²³⁵ , U ²³⁸ and associated decay products	5,000	15,000	1,000
Transuranics, Ra ²²⁶ , Ra ²²⁸ , Th ²³⁰ , Th ²²⁸ , Pa ²³¹ , Ac ²²⁷ , I ¹²⁵ , I ¹²⁹	100	300	20
Th-nat, Th ²³² , Sr ⁹⁰ , Ra ²²³ , Ra ²²⁴ , U ²³² , I ¹²⁶ , I ¹³¹ , I ¹³³	1,000	3,000	200
Beta-gamma emitters (nuclides with decay modes other than alpha emission or spontaneous fission) except Sr ⁹⁰ and others noted above.	5,000	15,000	1,000

It should be understood that scanning minimum detectable activities may vary depending upon background count rate and calibration efficiencies. However, scan speed, background, and count times will be utilized in such a manner that minimum detectable activities for alpha and beta-gamma are kept as low as possible and <75% of the criteria in Table 1 for fixed and loose surface activities.

Radiation Protection staff will perform routine radiological surveys at a specified frequency consistent with the RSP implementing procedures. The PM will routinely review surveys with regard to necessity and frequency consistent with good radiological protection practices and regulatory requirements.

The following are surveys that will normally be conducted for this project:

- Daily surveys of active work areas and access/egress points
- Weekly surveys of offices and break areas
- Pre-job surveys to support radiation work permit requirements, as necessary
- Radiological air monitoring of workers and active work areas
- Perimeter air monitoring
- Release of material from Restricted Areas
- Radioactive material shipments
- Monitoring spills or spread of radioactive material
- Establishing and verifying radiological controlled area boundaries and postings
- Monitoring areas and accesses that may have a high potential for change

8.2 Dose Rate Surveys

Routine and specific dose rate surveys will give the radiation protection personnel, as well as the worker, an indication of the amount of external occupational radiation exposure per unit time that an individual will receive while performing assigned tasks in a specific area.

Specific dose rate surveys are needed to determine the disposition of radioactive material or if engineering controls are needed to reduce the exposure to the worker. This particularly applies during entry into areas that have not been previously surveyed and into demolition/excavation areas.

Routine and special dose rate surveys shall be performed in accordance with the RSP implementing procedures. Prior to using a meter, the individual performing the survey shall verify that the meter is in calibration and the batteries are in good working condition and that the meter performance test has been completed.

While performing dose rate surveys, consideration must be given to the types of radiation that are present in the work area so that hazards to personnel in the work area can be identified. Should any action levels be identified during the survey, the technician will take the appropriate action necessary and perform required notifications. All required dose rate surveys will be documented by the individual performing the survey.

8.3 Contamination Surveys

Radioactive contamination surveys are an important part of the Radiation Protection Program. Based on results of radioactive contamination surveys that are performed in the various work areas, storage areas, and support areas, assessments can determine the controls for radioactive material and to establish radiation protection requirements for personnel working in an area or on equipment.

There are two basic types of radioactive contamination: fixed and smearable (removable or loose surface). Radioactive contaminants are external exposure hazards only as long as the contamination remains fixed. Smearable radioactive contaminants represent both external and internal exposure hazards. Routine contamination surveys are primarily conducted to determine smearable levels while special contamination surveys are for smearable and fixed.

Usually contamination surveys are performed in conjunction with dose rate surveys. All smear results will be recorded in disintegrations per minute per 100 square centimeters (dpm/100 cm²) unless otherwise indicated on the Radiological Survey Form. A drawing of the survey area or item shall be completed by the surveyor. The individual survey point shall be numbered and the number circled, indicating a smear location on the drawing. Smears will normally be counted on site using a dual channel scaler or proportional counter, however in some instances "field counting" may be appropriate using a portable hand-held detector. Any detectable activity on the large area smear (i.e. masslin) will be further investigated and augmented with 100 cm² smears to determine the exact extent of the loose contamination and determine if decontamination of the area, equipment, tool, etc. is necessary.

Care must be taken to avoid damage to the Mylar surfaces of detectors. Scan speed should be no greater than 1/2 probe width per second and, at a distance of 1/2" or less for beta-gamma, 1/4" or less for alpha detection from the surface being surveyed. Audible indicators should be used. The total indicated counts per minute; minus the background counts per minute, divided by the detector efficiency, will equal the dpm per smear area.

Personnel contamination surveys shall be performed by any individual exiting from the exclusion zone. The background count rate in these areas shall be less than 200 cpm beta gamma as measured with a GM-type pancake detector. Any detectable (above background) personnel contamination will be removed using methods such as washing and wiping. Contamination of the face area will require further review by the RSO. A fixed frisking point shall be established by the step off pad area. In addition to personnel, all items leaving a contamination area shall be surveyed and will be free of contamination upon release.

Any time a vehicle exits a contamination area or the Exclusion Zone, a smear survey shall be performed on the tires and forks in addition to a contamination survey on the vehicle for unrestricted use.

Table 1. Acceptable Surface Contamination Levels (EM 385-1-80) shows acceptable surface contamination levels; however, items exhibiting activity detectable above background will not be released for unrestricted use, and will be treated as radioactively contaminated during the operations to be performed at the Tonawanda Landfill site. In that the COCs are radium-226, thorium-230, and thorium-232, the ACLs for the Tonawanda Landfill Site are as indicated in Table 1 for these radionuclides.

A contamination control procedure will govern the monitoring of equipment and vehicles that will be regularly entering and exiting the work areas. Surface contamination monitoring is required to allow the release of material, equipment, and vehicles from controlled areas. A personnel contamination survey and control procedure will also be in effect per the RSP. Support for decontamination activities will be provided as necessary.

8.4 Radiological Air Monitoring

The primary operational radiation protection concern at the site during work activities will be airborne radioactivity generated from drilling/soil sampling operations, etc. An air-sampling program consistent with the project RSP implementing procedures will be implemented to ensure compliance with occupational and environmental limits. The occupational air-sampling program will include general work area and breathing zone samples. The general area monitors will be located near the work activities most likely to have the highest airborne activity. Breathing zone air samplers will be provided to the persons most likely to be exposed in a given work group. The number of breathing zone air samples will depend on the level of airborne activity that is expected to be generated based upon the task being performed.

The OSHA limit for internal exposure is 40 MPC-hours in a week. Compliance will be routinely demonstrated by monitoring the exposure in DAC hours per week. The value is obtained by the following formula:

$$\text{Limit} = 40 \text{ MPC-hrs} * \text{MPC}_{\text{eff}}/\text{DAC}_{\text{eff}}$$

Where:

MPC_{eff} and DAC_{eff} represent the composite DAC values for the entire decay chain in equilibrium, exclusive of radon and progeny. The DAC_{eff} is calculated based on the unity rule and used to account for the different isotopes and DACs

All air sampling equipment will use dry glass fiber or membrane filter paper as the sampling media. Low-volume air samplers will usually average a draw volume of 1.0 - 4.0 cubic feet of air per minute. High-volume air samplers average a typical draw volume of 3.0 – 10.0 cubic feet of air per minute. The actual volume of each air sampler will be dependent upon model and individualized settings. Personal or lapel air samplers will use a dry glass fiber or membrane filter paper as a sample media and will typically operate at 2-5 liters per minute (lpm).

All air samples taken at the site will analyzed for gross alpha/beta-gamma activity. Elevated levels of alpha particulate without the presence of beta-gamma emitters will be cause for the air sample to be shipped to the analytical laboratory for alpha/gamma spectrometry. The radiological contaminant airborne action levels and actions to be taken are listed in Table 2.

Air sampling may be used to determine *a priori*, if respirators are needed for a given type of excavation or sampling activity. If respirators are not being used for a given activity, air sample results are reviewed to determine if action levels have been exceeded that would compel the need for respirators. In addition, the air sampling results will be reviewed to determine the need for dust suppression measures.

8.5 Air Sample Analyses

Information required for analysis includes date, counter background, counter efficiency, sample identification and location, time the sample was started and stopped, flow rate, count start time, total count time, and total counts of the counter, and self absorption factor (SAF). The alpha airborne activity analysis will have a SAF of 0.7(glass fiber) or 1.0 (membrane) applied. This factor will correct for the alpha absorption on the filter and media that are not seen by the detector. No SAF is required for airborne beta analyses. Calculated results will be recorded in microcurie per cubic centimeter ($\mu\text{Ci}/\text{cc}$ or $\mu\text{Ci}/\text{ml}$ which are equivalent units), unless otherwise indicated.

Samples shall be carefully removed from the packaging to prevent loss of sampled material. Counting a sample consists of placing the filter paper in a planchet and positioning the planchet directly under the counter probe. Counting time will be established to ensure an acceptable MDA. Acceptable MDA is typically 10% of the applicable DAC value as established in 10 CFR 20, Appendix B. Field counts may be performed using a count rate meter, but must be followed with the standard procedure using a scaler.

8.6 Operational Action Levels

A decision-making protocol for an upgrade in levels of protection and/or withdrawal of personnel from an area based on atmospheric hazards is outlined in *Table 2. Operational Action Levels*.

Type of Airborne Radioactivity Measurement	Activity	Action
Total Particulate-Work Area	5.0E-13 $\mu\text{Ci/ml}$	Stop operations that are presenting the problem until engineering controls can be established that will reduce airborne levels to below this level
Total Particulate - Perimeter	1.2E-15 $\mu\text{Ci/ml}$	Stop operations that are presenting the problem, evaluate work tasks in order to reduce airborne levels and reoccurrence

USACE EM 385-1-1 refers to 10CFR 20, Appendix B for airborne levels. The basis for action is at 1 DAC for any radionuclide. *Airborne Radioactivity area* means a room, enclosure or area in which airborne radioactive materials, composed wholly or partly of licensed material, exist in concentrations

- In excess of the derived air concentrations (DACs) specified in Appendix B, to §20.1001 – 20.2401, or
- To such a degree that an individual present in the area without respiratory protective equipment could exceed, during the hours an individual is present in a week, an intake equal to 12 DAC-hours.

Should airborne levels average 30% of 1 DAC-hour for the week and the person was not wearing a respirator, the person could receive 12 DAC-hours. In order to prevent exceeding this requirement, respiratory equipment will be worn during operations that are anticipated to generate airborne radioactivity, and the air monitoring action level will “flag” potential activity prior to meeting the requirement for tracking DAC-hours and/or the need to post an area as an “*Airborne Contamination Area*.” Primarily, the degree of restriction as applied to the perimeter of the site due to the potential affect on the public for unmonitored persons.

The perimeter operational action level is based on 40 CFR 61, National Emission Standards for Hazardous Air Pollutants (NESHAPS).

The EPA sets an offsite dose limit of 10 mrem per year, as stated in the following excerpt from 40 CFR 61.102:

“Emissions of radionuclides, including iodine, to the ambient air from a facility regulated under this subpart shall not exceed those amounts that would cause any member of the public to receive in any year an effective dose equivalent of 10 mrem/yr.”

8.7 Preliminary Walkover Survey

Upon completion of background measurements and sample analyses, ARSEC will perform an initial cursory gamma radiation walkover of the entire Tonawanda Landfill property to identify all radiological concerns and those that may not have already been previously identified. The emphasis of the survey will be biased towards the original locations of the contaminants and results of the survey compared against those results generated from the final site walkover survey. Both of the surveys will be performed utilizing Global Positioning Satellite [back-pack] systems with a color copy of the survey data submitted to USACE.

8.8 Establishment of Control Zones

Establishment of work area boundaries will be based on practicality and effectiveness and the sound professional judgment of the ARSEC Site Safety and Health Officer (SSHO), SRSO, and PM. Orange safety cones with radiological safety markings will be used to delineate the drilling and sampling work zones. PPE consisting of Tyvek suits, gloves, and shoe covers or easily decontaminated boots shall be worn in the work zones when initiating drilling activities in new investigative areas or when removable contamination greater than 700 dpm/100cm² is encountered. PPE levels shall be downgraded at the discretion of the site RSO and SSHO based on the results of on-site monitoring and off-site analytical results, including the analytical results from the 50+ borings installed in November 2009.

Site control measures must be implemented to minimize potential exposure to, and accidental spread of, contaminants during investigation activities. The following work zones are required to be established in the event routine contamination control monitoring results indicate loose surface contamination levels greater than 700 dpm/100 cm²:

- Exclusion
- CRZ
- Support

The zone boundaries may be modified as material removal from the site progresses.

The Exclusion Zone(s) will be established where there will be direct contact with the contaminated material. The level of PPE required will be based on hazard, site conditions and air monitoring performed. Modification to the size and boundary of the Exclusion Zone will be made based on operations and wind direction.

The CRZ (s) will be established to minimize the spread of contaminants from the Exclusion Zone into clean areas. The CRZ will consist of the area located in front of or next to the exclusion zone.

Support Zones will be maintained as non-contaminated areas and will be used as storage areas for operations equipment and where break facilities will be located. HPTs will designate radiological work zones as Radiation Areas and/or Radioactive Materials Areas, etc., as appropriate in accordance with site plan requirements. Access to these areas will be limited for the purpose of protecting individuals against undue risks from exposure to radiation and radioactive materials.

All personnel entering and exiting Exclusion and CRZs will sign in and out through the Support Zone. The log will indicate the date and time entering and exiting, the location entered, personal protective equipment utilized and procedures to be followed.

8.9 Routine Radiation and Contamination Surveys

ARSEC will perform site area and equipment routine surveys during the course of the project. Surveys will be performed to:

- Ensure compliance with applicable requirements of 10 CFR 20 and 385-1-1.
- Evaluate work practices and site conditions for trends.
- Recommend program modification based on trends, technical soundness and cost-effectiveness.

In order to be as cost-effective as practical, ARSEC will:

- Perform a needs assessment on routine surveys.
- Consolidate routine survey areas as much as possible.
- Pursue innovative means of rapid survey for all surfaces, using existing survey tools and other industry techniques.
- Ensure compliance and performance through self-assessment.

9.0 TRAINING

Site personnel shall be trained in Rad Worker II equivalent site specific training. Site personnel shall be trained before any work activity that may expose an individual to sources of radiation, and shall be trained to the potential risks associated with the project work activities. This training shall be based on the types of work and work locations that are specific to the individual's work assignment. This training shall be presented and the worker evaluated on a graded approach that considers the types of radiation, the potential exposure levels, and the risks to the individual associated with his/her work assignment. ARSEC will provide Radiological Worker training for Tonawanda Landfill staff. The records generated for the training program will be maintained at the site and will be available for review.

10.0 WORK SUPPORT ACTIVITIES

10.1 Engineering Controls

Implementation of engineering controls can reduce the need for personal protective equipment by separating the worker from the radiologically contaminated material. During investigation activities dust may be generated. The Site Superintendent, SRSO, and SSHO will be constantly alert to the possibility of unacceptable dust levels. Control measures will be implemented for all operations where dust is likely to be generated. Careful planning and implementation of controls will reduce potential dust concentrations. There are a number of specific construction practices, which will reduce levels of airborne particulates. These include:

- Providing for a misting spray during investigation activities
- Wetting and misting equipment and contaminated materials.
- Reducing the active work area surface and limiting the number of concurrent operations.

10.2 Posting Requirements

The entry control program is defined in accordance with the results of the radiological monitoring. This begins with posting the locations that allow access or entry into the areas containing the radiation sources. Posting should be at each access point to a controlled or restricted area of material removal activities at the Tonawanda Landfill site. The radiation protection staff will manage access of personnel to potential sources of radiation and/or radioactive materials.

10.3 Control of Radioactive Materials

The radioactive materials that require controls to prevent unauthorized access or removal fall into two broad categories: (1) discrete sources that may have some value or use and (2) radioactive waste. The first category will typically be in the form of sources used to perform radiation measurement instrumentation operability checks. The control of radioactive waste from investigation efforts will be defined in work plans, with supporting RSP requirements, to ensure wastes are properly prepared for packaging and transport.

10.4 Storage and Inventory

Any radioactive source that is licensed to and/or used by ARSEC at the Tonawanda Landfill site shall be stored in a secured location to prevent unauthorized access or removal. Sources shall be stored when not in use. When sources are removed from storage, a log shall be maintained that includes the following:

- Source description
- Name of person to whom source is assigned
- Location of source use
- Date of removal
- Date of return

At the beginning and at the end of the project, an inventory of radioactive sources licensed to or maintained by ARSEC shall be performed that includes the following:

- Sources obtained since last inventory
- Sources disposed of since last inventory
- Description and location of all existing sources

10.5 Instrumentation

Detection sensitivities capable of detecting the COCs to Minimum Detectable Concentrations (MDCs) will be estimated, using the guidance in NUREG-1575 (MARSSIM) and NUREG-1507.

Instrumentation and survey techniques will be chosen to achieve these sensitivities for the Tonawanda Landfill site land areas, for both scanning and direct measurements. This will assure identification of areas of elevated activity of a size and activity level that could adversely impact the survey. All instruments will have current calibrations for the radiations and energies found at Tonawanda Landfill, using National Institute of Standards and Technology (NIST)-traceable standards. Operational and background checks will be performed at the beginning of each day of survey activity and whenever there is reason to question instrument performance. Defective instruments will be removed from service and data obtained with that instrument since its previous acceptable performance, will be reviewed for acceptability.

All portable instrumentation will be quality control (QC) source-checked on a daily basis to ensure instruments are responding correctly. QC checks will be conducted by comparing the instrument's response to a designated radiation source and to ambient background.

QC source checks will consist of one-minute integrated counts with the designated source position in a reproducible geometry, performed at the designated location. Background checks will be performed in an identical fashion with the source removed. The results of the background and QC checks will be recorded in a field logbook.

10.6 Records

Work activities that involve potential radiation exposure to individuals are required by applicable regulatory agencies to include records that document the work was performed in compliance with applicable parts of the regulations. Records generated for Tonawanda Landfill activities in accordance with the provisions of this plan shall be maintained for the life of the ARSEC corporate entity or until disposition is legally authorized.

At a minimum, the following types of records, as pertinent to Tonawanda Landfill work activities, shall be produced and retained:

- Individual monitoring records
- Bioassay results
- Workplace monitoring records
- Worker preparation and training records
- Records of incidents
- Records of reviews and audits of the RSP

10.8 Reports to Individuals

Federal regulations require that the licensee or agency responsible for the control of occupational exposure to individuals and responsible for monitoring those individuals as part of that control may be required to provide written reports of the results of that monitoring to the individual.

10.9 Reports to Employers (Non-ARSEC)

At the written request of an individual who has been monitored for occupational radiation exposure by ARSEC, but is not an employee of ARSEC, ARSEC will provide a written record to that individual's employer or to any other agent specified by the individual. That record will contain a summary for the period of exposure monitored by ARSEC.

APPENDIX F

APP/SSHP Checklist for the Phase 2 Remedial Investigation of the Tonawanda Landfill Operable Unit, Tonawanda, New York

The remainder of this page intentionally left blank

CONTRACTOR ACCIDENT PREVENTION PLAN (APP) CHECKLIST (EM 385-1-1, Appendix - A, dated; 15 Sept. 08)

Minimum Basic Outline for Accident Prevention Plan

The APP is the Contractor Safety and Health Program Document. The following Site Specific Areas will be addressed:

NOTE: 1. Contractor will complete Checklist and Submit with their APP.

NOTE: 2. Contractor APP WILL be submitted in format below.

NOTE: 3. Safety Office will review Contractor APP and return to PM / COR.

NOTE: 4. Contractor APP's ARE NOT APPROVED by the USACE, only found as Acceptable or Non-Acceptable.

Safety Office Review Status: ACCEPTED BY/DATE: _____ NOT ACCEPTED BY/DATE: _____

Contractor Name:

Contract No:

Project Title & Location:	Included ?			Location: Page(s)
	Yes	No	N/A	
ALL CHECKLIST ITEMS WILL BE COMPLETED!				
1. SIGNATURE SHEET. Title, signature, and phone number of the following:	X			i
a. <i>Plan Preparer</i> (qualified person, Competent Person such as corporate safety staff person, QC).	X			i
b. <i>Plan Approval</i> by company/corporate officers authorized to obligate the company (e.g. owner company president, regional vice president etc.)	X			i
c. <i>Plan Concurrence</i> (e.g. Chief of Operations, Corporate Chief of Safety, Corporate Industrial Hygienist, project manager or superintendent, project safety professional, project QC). Provide concurrence of other applicable corporate and project personnel (Contractor).	X			i
2. BACKGROUND INFORMATION. List the following:				
a. Contractor;	X			1
b. Contract number;	X			1
c. Project name;	X			1
d. Brief project description, description of work to be performed, and location; phases of work anticipated (these will require an AHA).	X			2&3
3. STATEMENT OF SAFETY AND HEALTH POLICY. Provide a copy of your current corporate/company Safety & Health Policy Statement, detailing commitment to providing a safe and healthful workplace for all employees. The Contractor's written safety program goals, objectives, and accident experience goals for this contract should be provided.				
	X			4&5
4. RESPONSIBILITIES AND LINES OF AUTHORITIES. Provide the following:				
a. A statement of the employer's ultimate responsibility for the implementation of his SOH program;	X			5
b. Identification and accountability of personnel responsible for safety at both corporate and project level. Contracts specifically requiring safety or industrial hygiene personnel shall include a copy of their resumes. Qualifications shall include the OSHA 30-hour course or equivalent course areas as listed here:	X			6, 8, & 10
(1) OSH Act/General Duty Clause;			X	
(2) 29 CFR 1904, Recordkeeping;			X	
(3) Subpart C: General Safety and Health Provisions, Competent Person			X	
(4) Subpart D: Occupational Health and Environmental Controls, Citations and Safety Programs;			X	



CONTRACTOR ACCIDENT PREVENTION PLAN (APP) CHECKLIST (EM 385-1-1, Appendix - A, dated; 15 Sept. 08)

Minimum Basic Outline for Accident Prevention Plan

The APP is the Contractor Safety and Health Program Document. The following Site Specific Areas will be addressed:

NOTE: 1. Contractor will complete Checklist and Submit with their APP.

NOTE: 2. Contractor APP WILL be submitted in format below.

NOTE: 3. Safety Office will review Contractor APP and return to PM / COR.

NOTE: 4. Contractor APP's ARE NOT APPROVED by the USACE, only found as Acceptable or Non-Acceptable.

Safety Office Review Status: ACCEPTED BY/DATE: _____ NOT ACCEPTED BY/DATE: _____

Contractor Name:

Contract No:

Project Title & Location:	Included ?			Location: Page(s)
	Yes	No	N/A	
(5) Subpart E: PPE, types and requirements for use;			X	
(6) Subpart F: understanding fire protection in the workplace;			X	
(7) Subpart K: Electrical;			X	
(8)Subpart M: Fall Protection;			X	
(9) Rigging, welding and cutting, scaffolding, excavations, concrete and masonry, demolition; health hazards in construction, materials handling, storage and disposal, hand and power tools, motor vehicles, mechanized equipment, marine operations, steel erection, stairways and ladders, confined spaces or any others that are applicable to the work being performed.				
c. The names of Competent and/or Qualified Person(s) and proof of competency/qualification to meet specific OSHA Competent/Qualified Person(s) requirements must be attached. The District SOHO will review the qualifications for acceptance;	X			10
d. Requirements that no work shall be performed unless a designated competent person is present on the job site;	X			10
e. Requirements for pre-task safety and health analysis;	X			22
f. Lines of authority;	X			11
g. Policies and procedures regarding noncompliance with safety requirements (to include disciplinary actions for violation of safety requirements) should be identified;	X			11
h. Provide written company procedures for holding managers and supervisors accountable for safety.	X			5
5. SUBCONTRACTORS AND SUPPLIERS. If applicable, provide procedures for coordinating SOH activities with other employers on the job site:				
a. Identification of subcontractors and suppliers (if known);	X			11&12
b. Safety responsibilities of subcontractors and suppliers.	X			12
6. TRAINING.				
a. Requirements for new hire SOH orientation training at the time of initial hire of each new employee.	X			12
b. Requirements for mandatory training and certifications that are applicable to this project (e.g., explosive actuated tools, confined space entry, crane operator, diver, vehicle operator, HAZWOPER training and certification, PPE) and any requirements for periodic retraining/recertification.	X			12,13,&14
c. Procedures for periodic safety and health training for supervisors and employees.	X			12
d. Requirements for emergency response training. > Sec 9.b. below for a list of requirements that may require emergency response training.	X			13



CONTRACTOR ACCIDENT PREVENTION PLAN (APP) CHECKLIST (EM 385-1-1, Appendix - A, dated; 15 Sept. 08)

Minimum Basic Outline for Accident Prevention Plan

The APP is the Contractor Safety and Health Program Document. The following Site Specific Areas will be addressed:

NOTE: 1. Contractor will complete Checklist and Submit with their APP.

NOTE: 2. Contractor APP WILL be submitted in format below.

NOTE: 3. Safety Office will review Contractor APP and return to PM / COR.

NOTE: 4. Contractor APP's ARE NOT APPROVED by the USACE, only found as Acceptable or Non-Acceptable.

Safety Office Review Status: ACCEPTED BY/DATE: _____ NOT ACCEPTED BY/DATE: _____

Contractor Name:

Contract No:

Project Title & Location:	Included ?			Location: Page(s)
	Yes	No	N/A	
7. SAFETY AND HEALTH INSPECTIONS.				
a. Specific assignment of responsibilities for a minimum daily job site safety and health inspection during periods of work activity: Who will conduct (e.g., SSO, PM, safety professional, QC, supervisors, employees – depends on level of technical proficiency needed to perform said inspections), proof of inspector’s training/qualifications, when inspections will be conducted, procedures for documentation, deficiency tracking system, and follow-up procedures;	X			15&16
b. Any external inspections/certifications that may be required (e.g., USCG).			X	
8. ACCIDENT REPORTING. The Contractor shall identify person(s) responsible to provide the following:				
a. Exposure data (man-hours worked);	X			16
b. Accident investigations, reports, and logs: Report all accidents as soon as possible but not more than 24 hours afterwards to the Contracting Officer/Representative (CO/COR). The contractor shall thoroughly investigate the accident and submit the findings of the investigation along with appropriate corrective actions to the CO/COR in the prescribed format as soon as possible but no later than five (5) working days following the accident. Implement corrective actions as soon as reasonably possible;	X			16
c. The following require immediate accident notification:				
(1) A fatal injury;	X			16
(2) A permanent total disability;	X			16
(3) A permanent partial disability;	X			16
(4) The hospitalization of three or more people resulting from a single occurrence;	X			16
(5) Property damage of \$200,000 or more.	X			16
9. PLANS (PROGRAMS, PROCEDURES) REQUIRED BY THE SAFETY MANUAL. Based on a risk assessment of contracted activities and on mandatory OSHA compliance programs, the Contractor shall address all applicable occupational risks and compliance plans. Using the EM 385-1-1 as a guide, plans may include but not be limited to:				
a. Layout plans (04.A.01);	X			17&19
b. Emergency response plans:	X			20
(1) Procedures and tests (01.E.01);	X			20
(2) Spill plans (01.E.01, 06.A.02);	X			21



CONTRACTOR ACCIDENT PREVENTION PLAN (APP) CHECKLIST (EM 385-1-1, Appendix - A, dated; 15 Sept. 08)**Minimum Basic Outline for Accident Prevention Plan**

The APP is the Contractor Safety and Health Program Document. The following Site Specific Areas will be addressed:

NOTE: 1. Contractor will complete Checklist and Submit with their APP.

NOTE: 2. Contractor APP WILL be submitted in format below.

NOTE: 3. Safety Office will review Contractor APP and return to PM / COR.

NOTE: 4. Contractor APP's ARE NOT APPROVED by the USACE, only found as Acceptable or Non-Acceptable.

Safety Office Review Status: ACCEPTED BY/DATE: _____ NOT ACCEPTED BY/DATE: _____

Contractor Name:

Contract No:

Project Title & Location:	Included ?			Location: Page(s)
	Yes	No	N/A	
(3) Firefighting plan (01.E.01, Section 19);			X	
(4) Posting of emergency telephone numbers (01.E.05);	X			21
(5) Man overboard/abandon ship (Section 19.A.04);			X	
(6) Medical Support. Outline on-site medical support and offsite medical arrangements including rescue and medical duties for those employees who are to perform them, and the name(s) of on-site Contractor personnel trained in first aid and CPR. A minimum of two employees shall be certified in CPR and first aid per shift/site (Section 03.A.02; 03.D);				
c. Plan for prevention of alcohol and drug abuse (01.C.02);	X			22
d. Site sanitation plan (Section 02);	X			22
e. Access and haul road plan (4.B);	X			17&19
f. Respiratory protection plan (05.G);	X			
g. Health hazard control program (06.A);	X			23
h. Hazard communication program (06.B.01);	X			24
i. Process Safety Management Plan (06.B.04);			X	
j. Lead abatement plan (06.B.05 & specifications);			X	
k. Asbestos abatement plan (06.B.05 & specifications);			X	
l. Radiation Safety Program (06.E.03.a);	X			E-1
m. Abrasive blasting (06.H.01);			X	
n. Heat/Cold Stress Monitoring Plan (06.I.02)	X			35,36,37,&38
o. Crystalline Silica Monitoring Plan (Assessment) (06.M) ;			X	
p. Night operations lighting plan (07.A.08);			X	
q. Fire Prevention Plan (09.A);	X			24
r. Wild Land Fire Management Plan (09.K);			X	
s. Hazardous energy control plan (12.A.01);			X	
t. Critical lift Plan (16.H);			X	
u. Contingency plan for Floating Plants for severe weather (19.A.03);			X	
v. Float Plan (19.F.04);			X	
w. Site-Specific Fall Protection & Prevention Plan (21.C);	X			25
x. Demolition plan (to include engineering survey) (23.A.01);			X	
y. Excavation/trenching plan (25.A.01);			X	
z. Emergency rescue (tunneling) (26.A.);			X	

CONTRACTOR ACCIDENT PREVENTION PLAN (APP) CHECKLIST (EM 385-1-1, Appendix - A, dated; 15 Sept. 08)

Minimum Basic Outline for Accident Prevention Plan

The APP is the Contractor Safety and Health Program Document. The following Site Specific Areas will be addressed:

NOTE: 1. Contractor will complete Checklist and Submit with their APP.

NOTE: 2. Contractor APP WILL be submitted in format below.

NOTE: 3. Safety Office will review Contractor APP and return to PM / COR.

NOTE: 4. Contractor APP's ARE NOT APPROVED by the USACE, only found as Acceptable or Non-Acceptable.

Safety Office Review Status: ACCEPTED BY/DATE: _____ NOT ACCEPTED BY/DATE: _____

Contractor Name:

Contract No:

Project Title & Location:	Included ?			Location: Page(s)
	Yes	No	N/A	
aa. Underground construction fire prevention and protection plan (26.D.01);			X	
bb. Compressed air plan (26.I.01);			X	
cc. Formwork and shoring erection and removal plans (27.C);			X	
dd. PreCast Concrete Plan (27.D);			X	
ee. Lift slab plans (27.E);			X	
ff. Steel erection plan (27.F.01);			X	
gg. Site Safety and Health Plan for HTRW work (28.B);	X			30-40
hh. Blasting Safety Plan (29.A.01);			X	
ii. Diving plan (30.A.13);			X	
jj. Confined space Program (34.A).			X	
10. RISK MANAGEMENT PROCESSES. Detailed project-specific hazards and controls shall be provided by an Activity Hazard Analysis (01.A.13) for each major phase/activity of work.	X			41-45, D-1 – D-26
11. ABBREVIATED APP for LIMITED-SCOPE SERVICE, SUPPLY AND R&D CONTRACTS. If service, supply and R&D contracts with limited scopes are awarded, the contractor may submit an abbreviated Accident Prevention Plan. This APP shall address the following areas at a minimum. If other areas of the EM 385-1-1 are pertinent to the contract, the contractor must assure these areas are addressed as well.			X	
a. Title, signature, and phone number of the plan preparer.			X	
b. Background Information to include: Contractor; Contract number; Project name; Brief project description, description of work to be performed, and location (map); The project description shall provide a means to evaluate the work being done (see AHA requirements in 01.A.13) and associated hazards involved. Contractor's APP shall address the identified hazards involved and the control measures to be taken.			X	
c. Statement of Safety and Health Policy detailing their commitment to providing a safe and healthful workplace for all employees.			X	
d. Responsibilities and Lines of Authorities – to include a statement of the employer's ultimate responsibility for the implementation of his SOH program; Identification and accountability of personnel responsible for safety at all levels to include designated site safety and health officer (SSHO) and associated qualifications. The District SOHO will review the qualifications for acceptance.			X	
e. Training - new hire SOH orientation training at the time of initial hire of each new employee and any periodic retraining/recertification requirements.			X	
f. Procedures for job site inspections - assignment of responsibilities and frequency.			X	



CONTRACTOR ACCIDENT PREVENTION PLAN (APP) CHECKLIST (EM 385-1-1, Appendix - A, dated; 15 Sept. 08)

Minimum Basic Outline for Accident Prevention Plan

The APP is the Contractor Safety and Health Program Document. The following Site Specific Areas will be addressed:

NOTE: 1. Contractor will complete Checklist and Submit with their APP.

NOTE: 2. Contractor APP WILL be submitted in format below.

NOTE: 3. Safety Office will review Contractor APP and return to PM / COR.

NOTE: 4. Contractor APP's ARE NOT APPROVED by the USACE, only found as Acceptable or Non-Acceptable.

Safety Office Review Status: ACCEPTED BY/DATE: _____ NOT ACCEPTED BY/DATE: _____

Contractor Name:

Contract No:

Project Title & Location:	Included ?			Location: Page(s)
	Yes	No	N/A	
g. Procedures for reporting man-hours worked and reporting and investigating any accidents as soon as possible but not more than 24 hours afterwards to the Contracting Officer/Representative (CO/COR). An accident that results in a fatal injury, permanent partial or permanent total disability shall be immediately reported to the Contracting Officer.			X	
h. Emergency Planning. Employees working alone shall be provided an effective means of emergency communication. This may be cellular phone, two-way radio or other acceptable means. The selected means of communication must be readily available and must be in working condition.			X	
i. Drinking Water provisions, toilet and washing facilities.			X	
j. First Aid and CPR training (at least two employees on each shift shall be qualified/certified to administer first aid and CPR) and provision of first aid kit (types/size).			X	
k. Personal Protective Equipment.			X	
(1) WORK CLOTHING - Minimum Requirements. Employees shall wear clothing suitable for the weather however minimum requirements for work shall be short-sleeve shirt, long pants (excessively long or baggy pants are prohibited) and leather work shoes. If analysis determines that safety-toed (or other protective) footwear is necessary (i.e., mowing, weed eating, chain saw use, etc), they shall be worn.			X	
(2) Eye and Face Protection. Eye and face protection shall be worn as determined by an analysis of the operations being performed HOWEVER, all involved in chain saw use, chipping, stump grinding, pruning operations, grass mowing, weed eating and blowing operations shall be provided safety eyewear (Z87.1) as a minimum.			X	
(3) Hearing Protection. Hearing protection must be worn by all those exposed to high noise activities (to include grass mowing and trimming, chainsaw operations, tree chipping, stump grinding and pruning).			X	
(4) Head Protection. Hard hats shall comply with ANSI Z89.1 and shall be worn by all workers when a head hazard exists. At a minimum, hard hats shall be worn when performing activities identified in (2) above.			X	
(5) High Visibility Apparel shall comply with ANSI/ISEA 107, Class 2 requirements at a minimum and shall be worn by all workers exposed to vehicular or equipment traffic.			X	
(6) Protective Leg chaps shall be worn by all chainsaw operators.			X	
(7) Gloves of the proper type shall be worn by persons involved in activities that expose the hands to cuts, abrasions, punctures, burns and chemical irritants.			X	
(8) If work is being performed around water and drowning is a hazard, PFDs must be provided and worn as appropriate.			X	
l. Machine Guards and safety devices. Lawn maintenance equipment must have appropriate guards and safety devices in place and operational.			X	



CONTRACTOR ACCIDENT PREVENTION PLAN (APP) CHECKLIST (EM 385-1-1, Appendix - A, dated; 15 Sept. 08)

Minimum Basic Outline for Accident Prevention Plan

The APP is the Contractor Safety and Health Program Document. The following Site Specific Areas will be addressed:

NOTE: 1. Contractor will complete Checklist and Submit with their APP.

NOTE: 2. Contractor APP WILL be submitted in format below.

NOTE: 3. Safety Office will review Contractor APP and return to PM / COR.

NOTE: 4. Contractor APP's ARE NOT APPROVED by the USACE, only found as Acceptable or Non-Acceptable.

Safety Office Review Status: ACCEPTED BY/DATE: _____ NOT ACCEPTED BY/DATE: _____

Contractor Name:

Contract No:

Project Title & Location:	Included ?			Location: Page(s)
	Yes	No	N/A	
m. Hazardous Substances. When any hazardous substances are procured, used, stored or disposed, a hazard communication program must be in effect and MSDSs shall be available at the worksite. Employees shall have received training in hazardous substances being used. When the eyes or body of any person may be exposed to corrosives, irritants or toxic chemicals, suitable facilities for quick drenching or flushing of the eyes and body shall be provided within 10 seconds of the worksite.			X	
n. Traffic control shall be accomplished in accordance with DOT's MUTCD.			X	
o. Control of Hazardous Energy (Lockout/Tagout). Before an employee performs any servicing or maintenance on any equipment where the unexpected energizing or startup of the equipment could occur, procedures must be in place to ensure adequate control of this energy.			X	
p. Driving, working on (i.e., working with equipment/mowers) while on slopes, working from/in boats/skiffs, etc shall also be considered and dealt with accordingly.			X	
HTRW Projects Additional Requirements (EM 385-1-1, Section 28 HAZWOPER): SSHP (Site Safety and Health Plan) shall be attached to the APP as an Appendix. The SSHP shall cover the following in project-specific detail. General information adequately covered in the APP need not be duplicated.				
a. Site description and contamination characterization	X			2,3,30,&31
b. Hazard/Risk Analysis - AHA for each task	X			D-1 – D-26
c. Staff Organization; Qualifications; Responsibilities	X			5-11
d. Training - General, Supervisor and Project Specific	X			12-14
e. PPE Personal Protective Equipment	X			31,32,&33
f. Medical Surveillance	X			33&34
g. Exposure Monitoring/Air Sampling Program	X			34&35
h. Heat and Cold Stress - Procedures and Practices	X			35–38
i. SOPs Standard Operating Procedures; Engineering Controls; Work Practices:				
(1) Site rules/prohibitions (buddy system, eating/drinking/smoking restrictions, etc.)	X			23&24
(2) Work permit requirements (rad work, excavation, hot work, confined space etc.)	X			E-1
(3) Material handling procedures (soil, liquid, rad materials, spill contingency)	X			B-1
(4) Drum/container/tank handling (opening, sampling, draining, removal, etc.)			X	
(5) Comprehensive AHA of treatment technologies employed at site			X	
j. Site Control Measures: Clearly Defined EZ, SZ, CRZ	X			38
k. Personal Hygiene and Decontamination	X			39&40
l. Equipment Decontamination	X			40
m. Emergency Equipment and First Aid	X			21&22



CONTRACTOR ACCIDENT PREVENTION PLAN (APP) CHECKLIST (EM 385-1-1, Appendix - A, dated; 15 Sept. 08)

Minimum Basic Outline for Accident Prevention Plan

The APP is the Contractor Safety and Health Program Document. The following Site Specific Areas will be addressed:

NOTE: 1. Contractor will complete Checklist and Submit with their APP.

NOTE: 2. Contractor APP WILL be submitted in format below.

NOTE: 3. Safety Office will review Contractor APP and return to PM / COR.

NOTE: 4. Contractor APP's ARE NOT APPROVED by the USACE, only found as Acceptable or Non-Acceptable.

Safety Office Review Status: ACCEPTED BY/DATE: _____ NOT ACCEPTED BY/DATE: _____

Contractor Name:

Contract No:

Project Title & Location:	Included ?			Location:
	Yes	No	N/A	Page(s)
n. Emergency Response and Contingency Procedures:				
(1) Pre-emergency planning	X			20&21
(2) Personnel and lines of authority for emergency situations	X			20&21
(3) Criteria and procedures for emergency recognition and site evacuation (alarms, etc.)				
(4) Decontamination and medical treatment of injured personnel	X			21&22
(5) A route map to emergency medical facilities and phone numbers for emergency responders	X			C-1
(6) Criteria for alerting the local community responders	X			20&21



APPENDIX G

Resumes of Safety Personnel for the Phase 2 Remedial Investigation of the Tonawanda Landfill Operable Unit, Tonawanda, New York

The remainder of this page intentionally left blank

[REDACTED]

[REDACTED]

- USACE CQM Certified
- 40-Hr. HAZWOPER and 8-Hr. Refresher
- 30-Hr. OSHA Construction Safety

Site Safety and Health Officer

Eleven years experience as a Health and Safety Officer on projects ranging from underground utilities to temporary housing sites. Worked with the US Army Corps of Engineers on projects ranging from landfills to contaminated soil removal to dike restoration. Quality Control Manager on assorted construction projects including but limited to underground utilities, wastewater treatment systems, and temporary housing sites.

ARS International (May 2009 - Present)

SSHO

Provide Health & Safety supervision and oversight on field projects including D&D, remediation, and construction. Responsible for daily tailgate safety meetings, adherence to OSHA regulations and implementation of company/project health and safety plans.

Self Employed (May 2008 to Present)

Independent Property Claims Adjuster/Estimator

J. C. B. Construction Company, Inc. (2007 to 2008)

Project Coordinator/Estimator

As a Project Coordinator, [REDACTED] was responsible for the day-to-day management of field crews and subcontractors working on J.C.B Construction's projects. In this role, [REDACTED] assured compliance with OSHA construction safety standards.

Advanica Corp. (September to October 2006) (January to February of 2007)

Site Supervisor/Site Manager

As a Site Supervisor/Site Manager, [REDACTED] was often required to serve in a dual role as the SSHO. Projects included commercial and government projects throughout North Carolina and Virginia.

Pangea Group, Inc. (November 2005 to May 2006)

Health and Safety Officer

One of three Health and Safety Officers implementing operations for group trailer site locations in the greater New Orleans area for residents displaced by Hurricanes Katrina and Rita. Implemented daily safety meetings and visual inspections of developing sites to maintain safe working conditions. Daily site reporting of multiple site locations to the USACE and the prime contractor of performance objectives relevant to the safety of each site.

W. M Schlosser Inc. (2005)

Project Superintendent, QCM, and Health and Safety Officer

Responsible for the project H&S and Quality for a Wastewater Treatment Plant installation. Conducted daily safety briefings, managed adherence to OSHA regulations and implemented project H&S plans. Completed required paperwork as well as supervised subcontractors for the project.

Horne Engineering Services, Inc. (2000 to 2005)**Superintendent/H&S Officer**

Responsible for health, safety, and quality control requirements for projects which included first responder for fuel spills, underground storage leaks, contaminated soil cleanup, handling the disposal of contaminated soil, new landfill cell construction, installation of Methane extraction systems, landfill closure, and site restoration. Fuel system inspection for the FAA, fuel system updates with installation of new underground and above ground piping systems, new day-tank installation, control panel updates and update the general ascetics of the faculty. Experience in telephone, water, and sewer work as well as disposal dike rising for dredge materials and wetland restoration.

Handex of Maryland (1995 to 2000)**Superintendent/H&S Officer**

Responsible for health, safety, and quality control requirements for projects. Projects included first responder for fuel spills, underground storage leaks, contaminated soil cleanup, handling of the disposal of contaminated soil and new landfill cell construction. Methane extraction systems including leached collection and flare station set-up and site restoration.

Certifications/Licenses

USACE Construction Quality Management for Contractors (valid thru 2010)

Education/Training

University of Southwestern Louisiana, Industrial Technology, 1977 - 1978

Central State University, Industrial Technology, 1981

West Virginia State College, Industrial Technology, 1982

Fire Fighter First Class Cross Lanes, University West Virginia, 1983

United Technology Institute, Welding Training, 1986

40-hour OSHA HAZWOPER Training

30-hour OSHA Construction Training

8-hour HAZWOPER Refresher Training

8-hour OSHA Supervisory Training

Project Management Training

CPR and Basic First Aid Training

██████████, P.E., C.I.H., C.S.P.

Safety and Health Manager

25 years of experience as an environmental engineer, safety professional and program manager. He has been involved in safety and health management as well as serving as senior project engineer. His technical experience includes environmental, occupational, and industrial safety compliance; and environmental and safety regulatory compliance for engineering design. ██████████ has assisted in various project tasks including development of numerous project and program plans and review of engineering design. He has also conducted training of project staffs to meet site health and

safety requirements; conducted program safety audits and assessments to ensure environmental and occupational compliance and to ensure design requirements are met

ARSEC International (June 2007 - Present)

HSM

██████████ has been responsible for overall safety and health program administration and implementation for more than 150 field technicians who support HTRW facility operation and maintenance and environmental restoration projects at remediation facilities. He has conducted periodic safety audits and assessments of project activities and program requirements to ensure compliance with OSHA regulations.

Safety and Ecology Corporation (Oct. 1997 to Present)

HSM

On FUSRAP and other remediation projects, Mr. Peters provided consultation assistance on integrating radiological cleanup level into survey data points and in establishing a statistical analysis for determining final cleanup criteria. Used global positioning survey equipment for establishing excavation design criteria and ground-penetrating equipment to delineate locations of buried drums and debris. As a Health and Safety Consultant he supported a CERCLA project involved with characterization, excavation, and shipment of contaminated soil. ██████████ provided on-site health and safety oversight of the on-site project staff. He has developed or supported development of numerous Project Specifications, Characterization Plans, Decontamination Plans, Demolition Work Plans, blasting operations Plans, lead abatement Work Plans, and Site Health and Safety Plans. Assisted in development of safety procedures and program plans for UST removal, asbestos and lead abatement, building D&D and site soil remediation and restoration activities.

Apex Environmental, Inc., (June 1996 to 1997)

Health and Safety Specialist

Reviewed engineering design of process and analyzed hazards and potential problems that could allow release of hydrogen fluoride. Completed safety audit checklist to assist in development of Process Hazard Assessment. Developed engineering recommendations to minimize hazards and ensure safe operation with consideration of potential impacts to operation. Developed Process Hazard Analysis Report with applicable recommendations.

Ogden Environmental and Energy Services Co., Inc., (1993-1996)**Remediation Health and Safety Officer**

Developed or supported development of numerous Project Specifications, Characterization Plans, Decontamination Plans, Building Demolition Work Plans, Blasting operations Plans, Lead abatement Work Plans, and Site Health and Safety Plans. Assisted in development of safety procedures and program plans for underground storage tank removal, asbestos and lead abatement, building deactivation and demolition, and site soil remediation and restoration activities. As an Environmental, Health and Safety Specialist, [REDACTED] provided health and safety oversight at a CERCLA project involved placement of a cap over a chemical / radiological waste burial site. Hazards included beryllium and other radioisotopes as well as crystallized picric acid, which represented an explosion hazard. He coordinated development of Health and Safety Plan, Air Dispersion Modeling Plan, and Project Work Plan. Assessed engineering design aspects for assurance of compliance and provided engineering recommendations for controlling release of contaminants and for enhancing worker protection.

Private Consultant (1983-1993)**ES&H Specialist/Project Engineer**

As an ES&H consultant and Project Engineer, Mr. Peters provided;

- Consultation on environmental, safety and health issues. Reviewed 30, 60 and 90 percent designs and provided recommendations relative to ensuring regulatory compliance.
- Engineering support for the City of Mobile's Banana Wharf Asbestos Abatement Project in Mobile, AL, and for various other projects. Reviewed and approved engineering plans for abatement of asbestos-containing materials.
- Directed U.S. Air Force research projects for developing treatment technologies for hazardous and industrial waste cleanups and removal of uranium from soil
- Provided advice on construction and industrial process changes to ensure compliance with OSHA and Air Force Occupational Safety and Health Standards. Provided direct supervision, training, and management of Air Force technical personnel.
- Established and supervised industrial hygiene compliance programs. Reviewed building design including ventilation design systems and provided recommendations for regulatory compliance.

Certifications/Licenses

Licensed Professional Engineer, Ohio, 1989

Education/Training

M.S., Engineering

B.S., Agricultural Engineering

CSP, 1992

CIH, 1993

40-hour OSHA HAZWOPER Training

30-hour OSHA Construction Training

8-hour HAZWOPER Refresher Training

8-hour OSHA Supervisory Training

CPR and Basic First Aid Training