Appendix D

**Copy of Site Property Deed** 

| I   |
|---|
| PEC L SEL FOR<br>REST ATTN<br>ALSO TO                             |
| MAY 15 12 21 PH '86<br>REGISTER OF DEEDS S<br>TORUYTH STY, N.C. S |
| Recording Time, Book and Page                                     |
| Parcel Identifier No.   |
| n the day of , 19   |
| P.O. Drawer 1209, Burlington, NC 27216<br>Attorney at Law         |
|   |

| THIS DEED made this 14 day of May             | , 1986 , by and between   |
|---|---|
| GRANTOR                                       | GRANTEE   |
| RENTAL UNIFORM SERVICE OF WINSTON-SALEM, INC. | CINTAS CORPORATION, an Ohio Corporation<br>11315 Reed Hartman Highway<br>Cincinnati, Ohio 45241 |

Enter in appropriate block for each party: name, address, and, if appropriate, character of entity, e.q. corporation or partnership.

The designation Grantor and Grantee as used herein shall include said parties, their heirs, successors, and assigns, and shall include singular, plural, masculine, feminine or neuter as required by context.

WITNESSETH, that the Grantor, for a valuable consideration paid by the Grantee, the receipt of which is hereby acknowledged, has and by these presents does grant, bargain, sell and convey unto the Grantee in fee simple, all that certain lot or parcel of land situated in the City of , Middlefork Township,

Forsyth

County, North Carolina and more particularly described as follows:

BEGINNING at an existing iron pipe in the eastern margin of the right of way of Industrial Drive, a corner with Harvin and Company (now or formerly); running thence from said BEGINNING point and with the line of Harvin and Company (now or formerly), S. 87° 32' 38" E. 350.00 feet to an existing iron pipe in the line of Champion Industries, a corner with Champion Industries; running thence with the line of Champion Industries, S. 02° 27' 22" W. 258.6 feet to an existing iron pipe in the line of Champion Industries, a corner with Champion Industries; running thence with the line of Champion Industries, N. 87° 32' 38" W. 370.40 feet to an existing iron pipe in the eastern margin of the right of way of Industrial Drive, a corner with Champion Industries; running thence with the eastern margin of the right of way of Industrial Drive the following courses and distances: N. 19° 34' E. 17.00 feet to an existing iron pipe; N. 8° 10' E. 135.00 feet to an existing iron pipe; N. 01° 02' E. 108.00 feet to the point and place of BEGINNING and containing 2.11 acres, more or less, and being all the property of RENTAL UNIFORM SERVICE OF WINSTON-SALEM, INC.

This conveyance is subject to restrictions, rights of way and easements, if any, of record in the Forsyth County Registry.

N. C. Bar Assoc, Form No. 3 & 1976, Revised & 1977 - James Waltams & Co. Inc. Box 127 Yaok mode N. C. 27055 Printed by Agreement with the N. C. Bar Assoc. - 1981



The property hereinabove described was acquired by Grantor by instrument recorded in .....

A map showing the above described property is recorded in Plat Book . page

TO HAVE AND TO HOLD the aforesaid lot or parcel of land and all privileges and appurtenances thereto belonging to the Grantee in fee simple.

. ...

(SEAL)

And the Grantor covenants with the Grantee, that Grantor is seized of the premises in fee simple, has the right to convey the same in fee simple, that title is marketable and free and clear of all encumbrances, and that Grantor will warrant and defend the title against the lawful claims of all persons whomsoever except for the exceptions hereinafter stated. Title to the property hereinabove described is subject to the following exceptions:

| IN WITNESS WHEREOF, the Grantor has hereunto set his<br>corporate name by its duly authorized officers and its seal to be he<br>hove written. | hand and seal, or if corporate, has caused this instrument to be signed in its<br>reunto affixed by authority of its Board of Directors, the day and year first |
|---|---|
| RENTAL UNIFORM SERVICE OF WINSTON-SALEM, IN   | C. (SEAL)   |
| (Corporate Name)  | NC ON   |
| W KARAL ( MARANUS ( Resident  | Gran (SEAL)   |

CIC INI esident ATTEST Secreta:



| 1-Botomo                     | - BLA          | (SEAL)   |
|------------------------------|----------------|--|
| tary (Corporate Seal)        |                | (SEAL)   |
| NORTH CAROLINA, Alai         | nance          | County.  |
| I, a Notary Public of the Co | unty and State | aforesaid, certify that Grantor,                                   |
| nerconally appeared before m | e this day and | acknowledged the execution of the foregoing instrument. Witness my |

per Use hand and official stamp or seal, this \_\_\_\_\_ day of \_\_\_\_\_, 19\_\_\_\_\_

My commission expires: \_\_\_\_\_ Notary Public

NORTH CAROLINA, \_\_\_ALAMANCE\_\_\_\_County.



given and as the act of the corporation, the foregoing instrument was signed in its name by its 

Witness my hand and official stamp or seal, this \_\_\_\_\_\_\_ May \_\_\_\_<u>19\_\_\_86</u>\_\_\_ CON Aushaan\_ Notary Public My commission expires: 5/18/90 adii N HIOMANCE 'L'e. N.C. Kiaushaar Edith The foregoing Certificate(s) of \_\_\_ 4 is/are certified to be correct. This instrument and this certificate are duly registered at the date and time and in the Book and Page shown on the first page hereof. FORSYTH .....COUNTY Deputy/Accistant - Register of Deeds By PROBATE FEE \$1.00 PAID 100x 1542PU130 N. C. Bar Assoc, Form No. 3 @ 1976, Revised @ 1977 - James Wullarms & Co. Inc., Box 127, Yaskimville N. C. 27055 with the N. C. Bar Assoc. - 1981 

Drafted By Donald P. Klekamp Mail! Upotha a threman, One E. MA 27, Pro inder Toure erde, curimate, Ohre Agan CORPORATION DEED OF .... (Reprinted 3/86) Know All Men by These Presents: **Uhat** CINTAS CORPORATION n/k/a CINTAS CORPORATION, a Washington corporation, successor by reason of merger with CINTAS CORPORATION, an Ohio corporation, That the grantor, a corporation organized and existing under the laws of the State of Washington in consideration of One Dollar (\$1.00) and other good and valuable considerations CINTAS CORPORATION No. 1, an Ohio corporation, to it paid by whose address is 11255 Reed Hartman Highway, Cincinnati, Ohio 45241 the receipt whereof is hereby acknowledged, does hereby Grant, Bargain, Sell and Convey to the said CINTAS CORPORATION No. 1, an Ohio corporation, its heirs, successors' and assigns forever, the following described Real Estate<sup>2</sup>: See attached Exhibit "A". NO TAXABLE CONSIDERATION

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# Know All Men by These Presents:

385 1 ....

**Uhat** CINTAS CORPORATION n/k/a CINTAS CORPORATION, a Washington corporation, successor by reason of merger with CINTAS CORPORATION, an Ohio corporation,

a corporation organized and existing under the laws of the State of Washington

in consideration of One Dollar (\$1.00) and other good and valuable considerations

to it paid by CINTAS CORPORATION No. 1, an Ohio corporation,

whose address is 11255 Reed Hartman Highway, Cincinnati, Ohio 45241

the receipt whereof is hereby acknowledged, does hereby Grant, Bargain, Sell and Convey to the said CINTAS CORPORATION No. 1, an Ohio corporation,

its News, successors' and assigns forever,

the grantor,

the following described Real Estate':

See attached Exhibit "A".

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NO TAXABLE CONSIDERATION

and all the **Estate**, **Title and Interest** of the said CINTAS CORPORATION n/k/a CINTAS CORPORATION, a Washington corporation, successor by reason of merger with CINTAS CORPORATION, an Ohio corporation,

Artister

grantor,

either in Law or Equity, in and to the said premises; **Together** with all the privileges and appurtenances to the same belonging: **To have and to hold** the same to the only proper use of the said CINTAS CORPORATION No. 1, an Ohio corporation,

#### its MEETS, successors' and assigns forever.

And the said CINTAS CORPORATION n/k/a CINTAS CORPORATION, a Washington corporation, successor by reason of merger of CINTAS CORPORATION,

grantor,

for itself and for its successors, hereby **Covenants** with the said CINTAS CORPORATION No. 1, an Ohio corporation,

its heirs successors' and assigns,

that it is the true and lawful owner of the said premises, and has full power to convey the same; and that the title so conveyed is **Clear**, **Free and Unincumbered**; And **further**, That it **does Warrant and will Defend** the same against all claims of all persons whomsoever: save and except taxes and assessments due and payable in *Inc.* 1983 and *Haugher*, which the Grantee herein agrees to pay.

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a 1 a

#### w 1643-8671

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In Wilness Whereof. The said CINTAS CORPORATION n/k/a CINTAS CORPORATION, a Washington corporation, successor by reason of merger with CINTAS CORPORATION, an Obio corporation, grantor, has caused its corporate name to be hereunto subscribed and its corporate seal hereunto affixed, by Robert R. Buck, and Dorald P. Klekamp, thereunto duly authorized by resolution of its Board of Directors, this 23 day of May 19<sub>88</sub> . Signed and acknowledged in presence of CINTAS CORPORATION n/k/a CINTAS CORPORATION, a Washington corporation, successor by reason of merger with CINTAS CORPORATION, an Ohio corporation Bv ce President Roz Secretary<sup>t</sup> Donald P. Klekamp, State of County of Ohio Hamilton 55. 23 Be If Remembered, That on this day of 1988, May before me, the subscriber, a Notary Public in and for said County and State, personally appeared Robert R. Buck, Vice President, and Donald P. Klekamp, Assistnat Secretary, of CINTAS CORPORATION n/k/a CINTAS CORPORATION, a Washington the corporation. whose name is subscribed to and which executed the foregoing instrument, and for themselves and as such officers respectively, and for and on behalf of said corporation, acknowledged the signing and execution of said instrument; and acknowledged that the seal affixed to said instrument is the corporate seal of said corporation, that they affixed such corporate seal to, and otherwise executed, said instrument, by authority of the Board of Directors, and on behalf, of said corporation;3 and that the signing and execution of said instrument is their free and voluntary act and deed, their free act and deed as such officers respectively, and the free and voluntary act and deed of said corporation, the uses and purposes in said instrument mentioned. NO; In Testimony Whereof. I have hereunto subscribed my name and affixed my Notarial seal, on the day and year last aforesaid. ELEASETA Notary Public, State of Ohio Commission Expires March 28, 1990 This instrument was prepared by\_ Donald Reating, Muething & 1800 Provident Tower Klekamr Cincinnati, Ohio (1) If the Deed is to a natural person, delete "successors;" if to a oration (2) Include reference to volume and page of next preceding recorded instrument through which grantor claims title. (Ohio R.C. \$ 319.20) (3) In Ohio, failure to affix the corporate seal shall not affect the validity of any instrument. (Ohio R.C. § 1701.13(B)) 1643p0672



EXHIBIT "A"

BEGINNING at an existing iron pipe in the eastern margin of the right of way of Industrial Drive, a corner with Harvin and Company (now or formerly); running thence from said BEGINNING point and with the line of Harvin and Company (now or formerly), S. 87° 32' 38" E. 350.00 feet to an existing iron pipe in the line of Champion Industries, a corner with Champion Industries; running thence with the line of Champion Industries, S. 02° 27' 22" W. 258.6 feet to an existing iron pipe in the line of Champion Industries, a corner with Champion Industries; running thence with the line of Champion Industries, N. 87° 32' 38" W. 370.40 feet to an existing iron pipe in the eastern margin of the right of way of Industrial Drive, a corner with Champion Industries; running thence with the eastern margin of the right of way of Industrial Drive the following courses and distances: N. 19° 34' E. 17.00 feet to an existing iron pipe; N. 8° 10' E. 135.00 feet to an existing iron pipe; N. 01° 02' E. 108.00 feet to the point and place of BEGINNING and containing 2.11 acres, more or less, and being all the property of RENTAL UNIFORM SERVICE OF WINSTON-SALEM, INC.

This conveyance is subject to restrictions, rights of way and easements, if any, of record in the Forsyth County Registry.

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**.**. Î

Appendix E

Site Specific and Community Health and Safety Plan



# HEALTH AND SAFETY PLAN

Site Remedial Investigation (RI) Cintas-Former RUS Facility 3775 Industrial Drive Winston-Salem, North Carolina

Reviewed By – Russ Reynolds District Safety, Health and Environment Manager Southeast Environment

Reviewed By Michael Dail Site Safety Officer

\_\_\_\_\_04-14-2011 Date

4-19-2011

Wat

Reviewed By – S. Grant Watkins, PG, RSM Senior Program Manager

Date

Date

04-14-2011

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#### LIST OF ATTACHMENTS

Attachment A – Health and Safety Plan Review Form

Attachment B – JSA & THA

Attachment C – Pre-Entry Briefing and Daily Tailgate Meeting Attendance Form

Attachment D – Applicable SH&E SOPs

Attachment E – Safety Certifications, Field Forms, & Material Safety Data Sheets

Medical Services:

North Carolina Baptist Hospital 301-399 Medical Center Boulevard Winston-Salem, North Carolina (336)-716-2011

#### Directions and Map to North Carolina Baptist Hospital (Total Travel Estimate: 7.2 miles)

| Live Search Maps  | My Notes   |
|---|--|
| art: 3775 Industrial Dr, Winston Salem, NC 27105<br>d: 301 Medical Center Blvd, Winston Salem, NC<br>27103  |  |
| o: 7.2 mi, 10 min   |  |
| ▶ 1. Depart Industrial Dr   |  |
| 2. Turn left onto Kapp St   | 0.2 n  |
| 3. Turn left onto NE Patterson Ave  | 0.2 n  |
| 4. Take ramp right for US-52 South / John M   | Gold Fwy 4.1 n   |
| 5. At exit <b>109B</b> , take ramp right and follow sig   | ns for I-40 Bus West 2.2 n   |
| 6. At exit <b>4A</b> , take ramp <b>right</b> and follow signs  | for Cloverdale Ave 0.2 n   |
| 7. Turn right onto Cloverdale Ave   | 0.2 n  |
| 8. Turn left onto Medical Center Blvd   | 0.1 n  |
| Avers Ave<br>Normal | Control of the station of the statio |
| Petres Rd Polo Rd Bara Vista Polo Rd Rd Rd Rd Rey Reynolda Park Rd Reynolda Park Rd   | Anver School Rd Od Anver School Rd Od Ave  |
| Nilleter Rd Rd Rd Rd Bitting Rd   | e 12th St ye City View<br>e 12th St ye City View<br>e E 12th St ye City View<br>e E 12th St ye City View<br>e E 12th St ye City View<br>Statement of St Statement of St St Statement of St   |
| NPe Cound out St  | Salem of Reynolds Agric  |
| Vest Mill Rd Silas Creek Phone  | Arcadia Sunnyside Nathtown St  |

#### **Underground Utilities**

# North Carolina One Call Center

http://www2.ncocc.org/ncocc/homepage.htm

Call - 1-800-632-4949



The National One Call utilities phone number is 811

Notification should be no less than three working days before commencing intrusive work. The markings are valid for 15 working days from the date of the call to the notification center. Providing the correct spelling of the street name, pavement type, nearest cross-street, and the area to be marked will assist the locators in marking the location of underground facilities within the required 72-hour time period. Be sure to know what utilities are included and who is responsible for obtaining the clearance.

#### Poison Control Center

1-800-222-1222 (Nationwide)

#### **Emergency Muster Point**

The emergency routes and muster points must be determined by the SSO and communicated to on-site workers during the Pre-entry Site Safety Briefing.

| AECOM Project Representatives: | Office       | Mobile       |
|--------------------------------|--------------|--------------|
| Grant Watkins, PM              | 919-239-7183 | 919-608-5065 |
| Michael Dail, SSO              | 919-239-7142 | 919-451-8664 |
| Russell Reynolds, DHSM         | 864-234-3042 | 864-906-7309 |
| Harold McDaniel, RHSM          | 256-760-0686 | 256-366-7650 |

#### **AECOM Medical Records and Medical Consultant**

Work Care North Alameda, CA 94502 Telephone: 510-748-6900 Fax: 510-748-6915

| Emergency Organization / Agency   | Telephone Number |
|---|------------------|
| Police Department   | 911              |
| Fire Department   | 911              |
| Ambulance Service (EMT will determine appropriate hospital for treatment) | 911              |

|           | 000 121 0002 |
|-----------|--------------|
| Chem-Trec | 800-424-9300 |

#### HAZARD ASSESSMENT

The overall objective is to investigate environmental impacts from former industrial laundering and drycleaning activities at the former RUS facility. The scope of work includes the following components: DPT and hand auger soil borings; installation of monitoring wells; sampling of groundwater, soils, soil vapor, sediment, and surface water media; management of investigative-derived wastes; and surveying. Known contaminants included chlorinated VOCs; however, the remedial investigation work scope includes sampling for metals, SVOCs and phosphates to determine if these compounds are also present at the Site. This Health and Safety Plan addresses planned activities that would typically be performed by AECOM personnel during oversight and sample collection activities. Precautions that will be taken to protect the surrounding community and the environment during execution of the work are also included. This Health and Safety Plan will be updated or replaced if warranted by a change in Site conditions or change in work scope beyond that described herein.

#### Chemical Hazards

<u>VOCs</u> <u>SVOCs</u> <u>Metals</u> (See Section 3.1)

The potential routes of exposure to the contaminants of concern include:

- Dermal contact with contaminated soils during sample collection
- Dermal contact with contaminated soils and groundwater during well drilling and installation and soil and groundwater sampling
- Inhalation exposures to VOCs during well drilling and installation and soil and groundwater sampling.

Additionally, preservatives including hydrochloric acid, nitric acid, sulfuric acid, zinc acetate, and sodium hydroxide may be encountered during sampling activities. Gloves and safety glasses will always be worn when handling sample containers and collecting samples.

#### Physical Hazards

| Dust         | Falling Objects   | Flying Objects  | Heat    | Noise    |
|--------------|-------------------|-----------------|---------|----------|
| Pinch Points | Sharp Edges       | Traffic         | Lifting | Tripping |
| Splash       | Pressurized Lines | Heavy Equipment |         |          |

#### Personal Protective Equipment

Level D PPE will be used to protect workers from physical and potential chemical hazards at the site. Level D provides protection from physical hazards and dermal protection for chemical hazards. At a minimum, it is inclusive of a reflective safety vest, safety glasses, full-length pants, and steel toe boots. Additionally; a hard hat, hearing protection, and task specific gloves (Nitrile, Neoprene, Leather) will be used as appropriate to afford additional protection. Required PPE is listed in the THA for each activity per the scope of work for this effort.

| PPE Item                        | General      | Boring       | Sampling |  |
|---------------------------------|--------------|--------------|----------|--|
| Hard Hat                        |              | $\checkmark$ |          |  |
| ANSI Class II Safety Vest       | $\checkmark$ | $\checkmark$ | ✓        |  |
| Steel Toed Safety Shoes         | $\checkmark$ | $\checkmark$ | ✓        |  |
| Safety Glasses with Sideshields | $\checkmark$ | $\checkmark$ | ✓        |  |
| Nitrile Gloves*                 |              | *√           | *√       |  |
| Leather Gloves                  |              | $\checkmark$ |          |  |
| Hearing Protection              |              | $\checkmark$ |          |  |
| Tyvek                           |              | *√           |          |  |
| Full Face Splash Shield         |              | *√           |          |  |

\*Note that Nitrile gloves and coveralls are only required for persons likely to come in direct contact with potentially contaminated soils and/or groundwater. Coveralls are required for extensive contact with contaminated soils and decontamination of drilling equipment.

#### **Respiratory Protection**

| Parameter  | Zone Location<br>and Monitoring<br>Interval                             | Response Level<br>(Above Background)                        | Response Activity   |
|--|---|---|---|
| VOCs<br>(total by PID<br>with a 10.6 eV<br>bulb) | Breathing Zone,<br>every 15-30<br>minutes during<br>drilling activities | < 5 ppm   | Continue work in required PPE, station<br>personnel up-wind, and continue<br>monitoring.  |
|  |   | 5-15 ppm (sustained in BZ<br>for more than 5 minutes)       | Continue work in required PPE, continue<br>monitoring. Implement engineering<br>controls (dilution ventilation). Pull VC &<br>benzene draeger tubes. Contact SH&E<br>if benezene or VC are present. |
|  |   | > 15-50 ppm (sustained in<br>BZ for more than 5<br>minutes) | Contact the SSO, implement mitigation<br>measures and prepare to upgrade PPE<br>to Level C (organic vapor cartridge)  |
|  |   | > 50 ppm  | Cease work, exit, and contact the Safety<br>Professional and PM.  |
| VOCs<br>(total by PID                            | Edge of Exclusion<br>Zones, every 30                                    | < 5 ppm   | Continue work in required PPE, monitor air, and implement engineering controls.   |
| with a 10.6 eV<br>bulb)                          | minutes during drilling activities                                      | > 5 ppm (sustained in BZ<br>for more than 5 minutes)        | Continue mitigation measures and<br>contact the Safety Professional   |

# THE FIRST LINE OF DEFENSE IS ALWAYS TO IMPLEMENT BEST WORK PRACTICES AND ENGINEERING CONTROLS TO ELIMINATE EXPOSURE. PPE IS THE SECONDARY CHOICE OF PROTECTION WHEN EXPOSURES TO HAZARDS CAN NOT BE ELIMINATED.



**Reporting Injuries and Near Misses** 

<u>All injuries must be reported to your supervisor and the Regional Health and Safety Manager as soon as possible.</u> All accidents and incidents that occur on-site during any field activity will be promptly reported to the SSO and the immediate supervisor in accordance with SH&E 201, *Incident Reporting*. If any AECOM employee is injured and requires medical treatment, the Site Supervisor will contact the Regional Safety Manager, AECOM's Incident Reporting Line at (800) 348-5046, and the applicable Account Manager immediately.

#### 1.0 INTRODUCTION

#### 1.1 AECOM Safety Policy

AECOM, Inc. (AECOM) is committed to providing our employees with a safe and healthy work environment. It is not only our obligation to each other, but also a sound business practice to do so. Work related injuries and illnesses cause needless pain and suffering, cost money, and adversely affect our reputation with our clients. It is our firm belief that all work related injuries and illnesses are preventable, and it is therefore our goal to have a workplace that is free from occupational injuries and illnesses. Every attempt shall be made to eliminate the possibility of injuries and illnesses. No aspect of the company's activities, including expediency and cost, shall take precedence over the health and safety of our employees.

The provisions of this HASP are mandatory for all AECOM personnel engaged in fieldwork associated with the environmental services being conducted at this site. A copy of this HASP and applicable SOPs will be maintained on-site. AECOM's SH&E guiding principles and SH&E Policy Statement are attached. These documents outline our approach to safety, define our company safety culture, and establish the foundation upon which a best-in-class safety program has been built. AECOM's consolidation of all corporate resources is on-going and many parallel resources are being utilized during this transitional period. The AECOM Safety Website is located on the Corporate Intranet, and is available for all AECOM employees as a resource for safety information, updates, and procedures. AECOM SH&E SOPs are available electronically at:

#### AECOM SH&E SOPS

Record keeping will be maintained in accordance with this HASP and the applicable Standard Operating Procedures (SOPs). In the event of a conflict between this HASP, the SOPs and federal, state, and local regulations, workers shall follow the most stringent/protective requirements.

#### 1.1.1 Health and Safety Expectations

Commitment to safety, health, and environmental excellence requires that all work proceed only after it is safe and environmentally sound to do so. The responsibility for ensuring that this takes place rests with every worker present at this property. Effectively meeting these responsibilities depends upon open communication between individuals and their supervisors prior to work beginning, and – in certain cases – after safety, health and/or environmental issues are identified.

The safety and health of on-site personnel will take precedence over cost and schedule considerations for all project work. All AECOM personnel covered by this HASP have the authority to STOP WORK if they see a potential or actual hazard that may threaten the safety of people or the environment. Upon stopping work, the Site Safety Officer (SSO) must be immediately notified and provided with information regarding the nature of the safety, health or environmental concern. The SSO should meet with the worker with the intent of resolving the worker's concerns. Once the concerns are resolved to the satisfaction of the worker, work can proceed.

If the concerns are not resolved to the satisfaction of the worker and/or the SSO, work does not proceed. The AECOM Regional Health and Safety Manager (RHSM) or District Health & Safety manager (DHSM) will be contacted to obtain assistance in resolving the concerns. Using his/her expertise, safety, health, and environmental rules, regulations, and procedures, the AECOM Safety Professional will attempt to resolve the matter with all parties involved. Work will not resume until this criterion is met.

#### 1.1.2 Tailgate Meetings

Prior to the commencement of daily project activities, a pre-entry briefing or tailgate meeting will be conducted by the SSO to review the specific requirements of this HASP, review and revise the JSA, and discuss site conditions that have changed since the previous day or trip to the site. Attendance at the daily tailgate meeting is mandatory for all personnel covered by this HASP at the site and must be documented on the attendance form provided in Attachment C. HASP sign-off sheets should also be collected at the time of the tailgate meetings. All documentation should be maintained in the project file.

#### 1.1.3 Maximum Duration of the Work Day for Field Activities

An employee may not work a shift that exceeds 16 hours in duration. For the purpose of this policy, the work shift includes time spent at lunch and on break. If an employee works more than one shift during the course of a calendar day, the total number of hours worked in that day cannot exceed 16 hours.

#### 1.2 Health and Safety Plan (HASP)

#### 1.2.1 HASP Purpose

The purpose of this HASP is to identify hazards associated with this project and specify engineering and administrative controls and personal protective equipment necessary to mitigate the risks associated with these hazards. This HASP addresses the hazards recognized prior to writing or updating the documents. As new hazards are encountered, a Task Hazard Analysis (THA) or Job Safety Analysis (JSA) must be conducted and the results input into the HASP. This HASP also assigns responsibilities for the implementation of safety programs on this project and defines monitoring and emergency response planning specific to the project.

#### 1.2.2 HASP Applicability

This site-specific Health and Safety Plan (HASP) has been developed by AECOM. It establishes the health and safety procedures required to minimize potential risk to AECOM and contractor personnel involved with the investigation.

Client, subcontractor, and visiting personnel who do not need to meet the training, medical surveillance, and personal protective equipment requirements of this HASP will not be exposed to hazards on the site and must be escorted at all times by a fully trained and qualified person with knowledge of all hazards on the site. Such unqualified people can include surveyors, utility locators, government personnel, AECOM and Client representatives, and others with business reasons to be at the site.

The provisions of this plan apply to AECOM and AECOM subcontractor personnel who will potentially be exposed to safety and/or health hazards related to activities described in Section 3.0 of this document.

#### 1.2.3 North Carolina Registered Environmental Consultants Community Health and Safety

This HASP has been written to comply with the requirements of 15A NCAC 13C.0306 (d) of the Technical Standards for Registered Environmental Consultants (REC) for the State of North Carolina. The project health and safety plan includes measures to protect the surrounding community from exposure to site contaminants. The goal is to ensure that the health and safety of all persons on and off site will not be adversely affected by Site investigations and remediation activities. AECOM is mindful of surrounding communities and will utilize professional judgment to seek responsible solutions to minimize off site impacts. In addition, AECOM is responsible for conforming with all local, state, and federal regulations for health and safety.

#### AECOM Job No. 60138541

The majority of the Site property is currently located within a fenced area and public access is limited. A portion of the field work will be within the fenced area of the Cintas property and contact with the general public during field activities is not anticipated in these on-site areas. However, a significant portion of the RI sampling work will occur on off-site properties that have less security controls to exclude the general public. In executing Site investigation activities, the guidelines outlined in this HASP will be followed to protect the surrounding community. Following is a summary of the typical activities to be performed and precautions to help protect the general public:

- Prior to work, the field team and subcontractors (as applicable) will review the work scope, HASP, and understand the potential chemical and physical hazards associated with the tasks to be performed and chemical constituents of concern;
- Underground utilities will be cleared in subsurface sample areas;
- Daily safety "tailgate" meetings will be conducted to discuss work scope and identify potential chemical and physical safety hazards;
- AECOM will communicate with Site facility personnel and off-site property owners where the work will
  occur to identify potential community issues/concerns;
- Known physical hazards will be controlled (such as traffic using cones/barricades), as described in Section 4 of this document.
- Work exclusion zones and Site controls will be used to prevent public access to the work area, as described in Section 7 of this document;
- Routine ambient air monitoring will be performed during work that brings subsurface contaminated media to the ground surface;
- Decontamination of subsurface tooling, drill rigs, and related equipment that comes into contact with contaminated media will be performed on the secured Cintas facility property and in a controlled manner to minimize/remove the potential for public exposure; and
- Investigation derived wastes (IDW) will be drummed, secured and transported away from point of generation on off-site properties. The IDW will be moved to the secure, fenced Cintas property for staging prior to disposal.

Additional measures will be implemented depending on Site conditions and work scope requirements. An updated HASP will be prepared as necessary to meet the requirements of the work scope or chemicals of concern.

# 1.2.4 Organization/Responsibility

The implementation of health and safety at this project location will be the shared responsibility of the AECOM Project Manager (PM), the AECOM Regional Health and Safety Manager (RHSM), the AECOM Project Site Safety Officer (SSO) and other AECOM personnel and AECOM's contractors implementing the proposed scope of work.

# 1.2.5 AECOM Project Manager

The AECOM PM is the individual who has the primary responsibility for ensuring the overall health and safety of this project. As such, the PM is responsible for ensuring that the requirements of this HASP are implemented. Some of the PM's specific responsibilities include:

- Assuring that all personnel to whom this HASP applies, including AECOM subcontractors, have received a copy of it;
- Providing the RHSM with updated information regarding conditions at the site and the scope of site work;

- Providing adequate authority and resources to the on-site SSO to allow for the successful implementation of all necessary safety procedures;
- Supporting the decisions made by the SSO and RHSM;
- Maintaining regular communications with the SSO and, if necessary, the RHSM;
- Coordinating the activities of all AECOM subcontractors and ensuring that they are aware of the pertinent health and safety requirements for this project; and,
- Conducting random project audits.

#### 1.2.6 AECOM Regional Health and Safety Manager

The AECOM RHSM, or designee, is the individual responsible for the preparation, interpretation, and modification of this HASP. Modifications to this HASP that might result in less stringent precautions cannot be undertaken by the PM or the SSO without the approval of the RHSM. Specific duties of the RHSM include:

- Writing, approving and amending the HASP for this project;
- Advising the PM and SSO on matters relating to health and safety on this site;
- Recommending appropriate personal protective equipment (PPE) and respiratory equipment to protect personnel from potential site hazards;
- Facilitating Incident investigations;
- Maintaining regular contact with the PM and SSO to evaluate site conditions and new information that might require modifications to the HASP; and,
- Conducting random project audits.

#### 1.2.7 AECOM Site Safety Officer

All AECOM personnel are responsible for implementing the safety requirements specified in this HASP. However, one staff member will serve as the SSO. The SSO is appointed by the PM and directed per the guidance of SH&E SOP 305 – Site Safety Officer. The SSO will be on-site during all activities covered by this HASP. The SSO is responsible for enforcing the requirements of this HASP once work begins. The SSO has the authority to immediately correct all situations where noncompliance with this HASP is noted and to immediately stop work in cases where an immediate danger is perceived. Some of the SSO's specific responsibilities include:

- Assuring that all personnel to whom this HASP applies, including all subcontractors, have reviewed this HASP, and submitted a completed copy of the HASP review and acceptance form (Attachment A);
- Assuring that all personnel to whom this HASP applies have attended a pre-entry briefing and any subsequent safety meetings that are conducted during the implementation of the program;
- Maintaining a high level of health and safety consciousness among employees implementing the proposed investigative activities;
- Securing Work Permits. The SSO must determine what, if any, work permits must be secured from the facility prior to the commencement of activities. If required, the SSO must determine how long the work permit is good for and verify that all the provisions of the work permit can be met by AECOM and its subcontractors;

- Procuring the air monitoring instrumentation required and performing air monitoring for investigative activities;
- Procuring and distributing the PPE and safety equipment needed for this project for AECOM employees;
- Verifying that all PPE and health and safety equipment used by AECOM is in good working order;
- Verifying that AECOM contractors are prepared with the PPE, respiratory protection and safety equipment required for this program;
- Preparing an initial Job Safety Analysis (JSA) during the initial mobilization and revising the Job Safety Analysis if conditions or tasks change and communicating with all workers the results of the Job Safety Analysis. See attachment B for a JSA form. The JSA will be reviewed daily by all workers and updated as needed.
- Notifying the PM of all noncompliance situations and stopping work in the event that an immediate danger situation is perceived;
- Monitoring and controlling the safety performance of all personnel within the established restricted areas to ensure that required safety and health procedures are being followed;
- Conducting accident/incident investigations and preparing accident/incident investigation reports;
- Conducting the pre-entry briefing prior to beginning work and subsequent safety meetings as necessary; and,
- Initiating emergency response procedures in accordance with Section 11.0 of this HASP.

#### 1.2.8 AECOM Field Personal

All AECOM field personnel covered by this HASP are responsible for following the health and safety procedures specified in this HASP and for performing their work in a safe and responsible manner. Some of the specific responsibilities of the field personnel are as follows:

- Assess each task prior to beginning work on that task for hazards and necessary precautions.
- Assess the work area for changing conditions and new hazards and address the hazards;
- Stop work and initiate corrective actions if work site hazards create unacceptable risk;
- Reading this HASP in its entirety prior to the start of on-site work;
- Submitting a completed HASP Review and acceptance form (Attachment A)to the AECOM SSO prior to the start of work;
- Attending the required pre-entry briefing prior to beginning on-site work and any subsequent safety meetings that are conducted during the implementation of the program;
- Bringing forth any questions or concerns regarding the content of the HASP to the PM or the SSO prior to the start of work;
- Reporting all Incidents, injuries and illnesses, regardless of their severity, to the AECOM SSO; and,
- Complying with the requirements of this HASP and the requests of the SSO.

#### 1.2.9 Contractors

Additionally, contractors hired by AECOM are responsible for:

• Proving in advance, a copy of a written safety plan and policies pertaining to their work;

- Reading the HASP in its entirety prior to the start of on-site work;
- Attending the required pre-entry briefing prior to beginning on-site work and any subsequent safety meetings that are conducted during the implementation of the program;
- Ensuring that their equipment is in good working order via daily inspections;
- Operating their equipment in a safe manner;
- Appointing an on-site safety coordinator to interface with the AECOM SSO;
- Providing AECOM with copies of material safety data sheets (MSDS) for all hazardous materials brought on-site;
- Providing AECOM with current copies of required training certifications for all personnel operating on-site; and,
- Providing all the required PPE, respiratory equipment and safety supplies to their employees.

#### 1.3 Management of Change/Modification of the HASP

#### 1.3.1 Management of Change

This document discusses the physical and chemical hazards associated with the proposed activities. However, unanticipated site-specific conditions or situations might occur during the implementation of this project. Also, AECOM and/or the contractors may elect to perform certain tasks in a manner that is different from what was originally intended due to a change in field conditions. As such, this HASP must be considered a working document that is subject to change to meet the needs of this dynamic project.

#### 1.3.2 Job Safety Analysis (JSA) – Task hazard Analysis (THA)

AECOM and/or AECOM's contractors will complete a Job Safety Analysis (JSA) or Task Hazard Analysis (THA) for each task to be performed. The use of new techniques will be reviewed and if new hazards are associated with the proposed changes, they will be documented and evaluated on the JSA form. An effective control measure must also be identified for each new hazard. JSA and THA forms will be reviewed by the SSO prior to being implemented. Once approved, the completed forms will be reviewed with all field staff during the daily safety meeting. A blank JSA form and THAs are presented in Attachment B.

#### 1.3.3 Employees Working Alone

Employees working alone at project sites will review the JSA/THA for their tasks as they are conducting their daily overview and reconnaissance of the site. After completing the review/revision and site reconnaissance, the employee should call the Project Manager and report any new hazards or site conditions observed. Guidance for employees working alone is outlined in SH&E SOP 306 – Working Alone.

#### 1.3.4 HASP Modification

Should significant information become available regarding potential on-site hazards, it will be necessary to modify this HASP. All proposed modifications to this HASP must be reviewed and approved by the AECOM RHSM before such modifications are implemented. Any significant modifications must be incorporated into the written document as addenda and the HASP must be reissued. The AECOM PM will ensure that all personnel covered by this HASP receive copies of all issued addenda. Sign-off forms will accompany each addendum and must be signed by all personnel covered by the addendum. Sign-off forms will be submitted to the AECOM PM. The HASP addenda should be distributed during the daily safety meeting so that they can be reviewed and discussed. Attendance forms will be collected during the meeting.

#### 2.0 SITE DESCRIPTION AND HISTORY

#### 2.1 Site Description

The Site is located at 3775 Industrial Drive, Winston-Salem, Forsyth County, North Carolina. The approximate geographical location of the center of the Site is at 36.150400° north latitude and 80.241400° west longitude (North American Datum of 1983 [NAD83]) and is approximately 950 feet above mean sea level. The Site currently consists one 20,000 square foot building located on approximately 2.1 acres of land. The majority of the Site property is fenced with a security controlled access gate. There are paved parking areas along the southern and western side of the building. The remaining areas consist of either driveways or grass cover. The Site is currently occupied by the document management business division of Cintas Corporation, and is used for secure document management operations.

#### 2.2 Site Overview

AECOM has developed a Work Plan for a proposed Remedial Investigation (RI) for the Site. The work will be completed in accordance with an executed Administrative Agreement (AA) between Cintas and the NCDENR. The AA defines the regulatory framework and completion schedules for the RI and subsequent remediation activities. This HASP is a component of the Work Plan.

The RI Work Plan (RIWP) has been prepared to provide a summary of previous investigations and additional information necessary to complete the RI. The RIWP includes the procedures required for field operations, environmental sampling, equipment decontamination, waste management, Quality Assurance/Quality Control (QA/QC), and documentation.

#### 2.3 Scope of Work

The scope of work includes soil, sediment, groundwater, and surface water sampling. This work will be completed using a variety of techniques.

| Anticipated<br>Task | Task                        | Additional Task Information  |
|---------------------|-----------------------------|--|
|                     | Mobilization/Demobilization | Mobilization: Assembly of necessary equipment<br>for the project including PPE. Demobilization:<br>Return of serviceable equipment to storage.   |
|                     | Utilities Survey            | AECOM will contact the North Carolina One-Call<br>Center to locate public utilities. In addition,<br>AECOM may coordinate and supervise a private<br>utility locate subcontractor to identify<br>underground utilities in the areas of the proposed<br>borings locations and possibly identify any<br>subsurface anomalies such as USTs. |
|                     | Soil Sampling               | Hand auger and direct-push drilling. Soils will be<br>lithologically profiled and screened with a PID.<br>Samples will be collected and submitted for<br>laboratory analysis.  |
|                     | Groundwater Sampling        | Samples will be collected by DPT methods and from monitoring wells and submitted for laboratory analysis.  |

| Sediment and Surface Water<br>Sampling | Samples will be collected and submitted for laboratory analysis.  |
|--|---|
| Soil Vapor Sampling                    | Soil gas vapor monitoring points will be installed.<br>Soil gas samples will be collected and submitted<br>for laboratory analysis.   |
| Monitoring Well Installations          | Monitoring wells will be drilled and constructed using heavy drilling equipment and DPT rigs.   |
| Survey                                 | Establish a vertical and horizontal datum and locate sample locations.  |
| Drum Handling/Storage                  | Moving drums containing chemical for treatment<br>processes. Filling drums with recovered oil or<br>containerizing cleanup materials from spills.<br>Moving drums for storage, labeling and shipping. |

#### 2.3.1 Mobilization/Demobilization:

Mobilization and demobilization represent limited pre- and post-task activities. These activities include driving to and from the site; initial site preparations; and post-work activities, such as removing files and office equipment and general housekeeping.

#### 2.3.2 Utilities Surveying

Prior to subsurface work, AECOM will contact the North Carolina One-Call Center to locate public utilities. In addition, AECOM may coordinate and supervise a private utility locate subcontractor to identify underground utilities in the areas of the proposed borings locations and possibly identify subsurface anomalies such as USTs.

#### 2.3.3 Soil Borings

The advancement of borings will be completed with either a hand auger or direct-push drill rig. The cores will then be assessed and logged by an on-site geologist. The soil samples will be screened using a portable photo-ionization detector for organic vapors and visually evaluated for evidence of contamination.

Contractors have direct control over the application and operation of all drilling and boring equipment owned by their organization. It is the equipment Contractor operator's responsibility to implement safe work practices provided by the Contractor project management or supervision supplemented by good judgment, safe control, and caution whenever operating drilling and boring equipment. Additional guidance is provided in AECOM SH&E 716: Drilling and Boring

#### 2.3.4 Monitoring Well Installation

During monitoring well installation, contractors have direct control over the application and operation of all drilling and boring equipment owned by their organization. It is the Equipment Contractor operator's responsibility to implement safe work practices provided by the Contractor project management or

supervision supplemented by good judgment, safe control, and caution whenever operating drilling and boring equipment. Additional guidance is provided in AECOM SH&E 716: Drilling and Boring.

Applicable permits and/or approvals will be obtained prior to implementing assessment activities. Temporary monitoring wells and soil borings, where applicable, will be constructed using standard equipment and methods. Soil samples will be collected and evaluated for lithological descriptions and for laboratory analysis. Wells may be developed by surging, bailing, or pumping. Development will be conducted until the water purged from the well is free of visible sediment and indicator parameters (pH, temperature, and specific conductivity) have stabilized.

# 2.3.5 Groundwater Sampling

Groundwater samples will be collected using low-flow sampling techniques (peristaltic pump). Clean, dedicated polyethylene tubing and a low flow peristaltic pump will be used for purging and sampling. During purging, water quality measurements will be measured using a water quality meter equipped with a flow-through cell. The temperature, pH, specific conductivity, dissolved oxygen, turbidity and oxidation-reduction potential (ORP) will be measured and recorded on groundwater sampling forms. Wells which are purged dry will be allowed to recover before sampling is completed. Before collecting analytical samples, the water quality meter will be disconnected, and water will be discharged directly from the dedicated peristaltic pump tubing into pre-preserved sample containers.

The collected samples will be handled in accordance with the procedures presented in the work plan, placed in a cooler with ice, and shipped to the laboratory for analysis. Groundwater produced during purging will be placed in properly labeled DOT approved drums and stored on site pending proper analysis, profiling and disposal off site.

# 2.3.6 Surveying

Sample locations will be surveyed to determine horizontal position and vertical elevation by a North Carolina licensed surveyor. Vertical elevation data will be surveyed to an accuracy of 0.01 feet and horizontal position data to an accuracy of 0.1 feet.

# 2.3.7 Management of Investigative-Derived Waste

All soil and water investigative-derived waste (IDW), including drill cuttings, equipment decontamination materials, sampling materials, and personal protective equipment will be containerized in 55-gallon steel drums for disposal at an appropriate offsite facility. Drummed IDW, including wastes generated from off-site sampling and well installation activities, will be transported and staged within the fenced portion of the Cintas property. Soil and water IDW samples will be characterized for toxicity using the Toxicity Characteristic Leaching Procedure prior to disposal.

# 2.3.8 Additional Work Operations

<u>Equipment Decontamination</u>: AECOM and subcontractor personnel will perform decontamination of equipment used to perform work within controlled work areas. IDW water from several on-site monitoring wells has been analyzed by a laboratory and determined to be characteristic hazardous waste. Proper personal protective equipment, including protection for eyes, and skin and hands, must be worn by any personnel performing decontamination operations.

# 2.4 Assumptions

Site related sample collection work performed by AECOM can be performed using Level D Personal Protective Equipment. AECOM personnel will utilize Modified Level D (to include Tyvek© Coveralls) during chemical blending/injection and chaps and face shields as appropriate during mechanized chain

saw or weed-eating clearing operations. Field work will be performed under good weather and ground conditions.

#### 3.0 CHEMICAL HAZARD ASSESSMENT AND CONTROL

#### 3.1 Chemical Contaminants of Concern

The following is a discussion of the potential hazards presented to worker personnel during this project from on-site chemical hazards known or suspected to be present at the Site. Currently, only VOCs have been tested and confirmed in Site media. The RI scope of work will include testing of soils and groundwater by analytical methods to confirm and quantify these and other potential chemicals. Screening will be conducted during intrusive soil boring to monitor airborne concentrations of VOCs. It should be noted that Occupational Exposure Limits (OEL) are typically measured in ppm and equivalent units vary according to the exposure media and routes of exposure, to include mg/L for liquids and mg/kg in solids. Airborne concentrations are measured as mg/m<sup>3</sup> and can be converted to ppm as follows: ppm = 24.45 x mg/m<sup>3</sup> / gram molecular weight.

| Chemical Name   | PEL <sup>1</sup>         | TLV <sup>2</sup>         | VP <sup>3</sup>                                   | VD <sup>4</sup> | SG⁵   | SOL <sup>6</sup> | FP <sup>7</sup> | LEL <sup>8</sup> | UEL <sup>9</sup> |
|---|--------------------------|--------------------------|---|-----------------|-------|------------------|-----------------|------------------|------------------|
| Perchloroethylene   | 100                      | 25                       | 14  | 4.9             | 1.62  | .02%             | NA              | NA               | NA               |
| Trichloroethylene   | 100                      | 50                       | 58  | 4.9             | 1.46  | .01%             | NA              | 8                | 10.5             |
| Methylene Chloride  | 25                       | 25                       | 350   | 3               | 1.3   | 2                | >140            | 13               | 23               |
| 1,1,1 Trichloroethane   | 10                       | 50                       | 19  | 4.6             | 1.44  | 0.1              | NA              | 6                | 16               |
| 1,1,2-Trichloroethane   | 10                       | 10                       | 19  | 4.6             | 1.44  | 0.4              | ?               | 8.4              | 13.3             |
| 1,1-Dichloroethylene  | ?                        | ?                        | 67  | 3.3             | 1.21  | <1               | -13             | 5.6              | 16               |
| 1,1-Dichloroethane  | 1                        | 1                        | 230   | 3.3             | 1.2   | <1               | -5.6            | 5.6              | NE               |
| Vinyl Chloride  | 1                        | NA                       | 25.2  | 1.6             | NA    | .03%             | NA              | 2.6              | 21.7             |
| Benzene   | 1                        | 0.5                      | 99  | 2.7             | 0.88  | 0.06             | 12.2            | 1.3              | 7.1              |
| Ethyl benzene   | 100                      | 100                      | 7.1   | 3.66            | 0.864 | 0.015            | 70              | 1.0              | 6.7              |
| Toluene   | 200                      | 20                       | 22  | 3.2             | 0.87  | NA               | 40              | 1.0              | 7.0              |
| Xylene, total   | 100                      | 100                      | 21  | 3.7             | 0.87  | NA               | 76              | 1.0              | 7.0              |
| Naphthalene   | 10                       | 10                       | 0.802   | ?               | 1.033 | NA               | 78.9            | 0.9              | 5.9              |
| Benzo(a)pyrene  | 0.2<br>mg/m <sup>3</sup> | 0.2<br>mg/m <sup>3</sup> | NA  | NA              | NA    | 0.0016           | >374            | NA               | NA               |
| <sup>1</sup> Permissible Exposure Limit in ppm <sup>7</sup> Flash Point in °F |                          |                          |   |                 |       |                  |                 |                  |                  |
| <sup>2</sup> Threshold Limit Value in ppm                                     |                          |                          | <sup>8</sup> Lower Explosive Limit in % by volume |                 |       |                  |                 |                  |                  |
| <sup>3</sup> Vapor Pressure in mm Hg  |                          |                          | <sup>9</sup> Upper Explosive Limit in % by volume |                 |       |                  |                 |                  |                  |
| <sup>4</sup> Vapor Density (air = 1)  |                          |                          | NA = Not Applicable                               |                 |       |                  |                 |                  |                  |
| <sup>°</sup> Specific Gravity (water = 1)                                     |                          |                          | ? = Not known                                     |                 |       |                  |                 |                  |                  |
| <sup>6</sup> Solubility in Water in %   |                          |                          | Insol – Insoluble                                 |                 |       |                  |                 |                  |                  |

#### Table 3-1 Potential Chemical Exposure Concerns

#### 3.1.1 Volatile organic compounds

Volatile organic compounds or mixtures are relatively stable chemically and exist in the liquid state at temperatures of approximately 32° to 482°F.

VOC's are used for extracting, dissolving, or suspending materials such as fats, waxes, and resins that are not soluble in water. The removal of the solvent from a solution permits the recovery of the solute intact with its original properties. VOC mixtures are also used as fuels.

Inhalation and percutaneous absorption are the primary routes of VOC uptake into the peripheral blood, which begins within minutes of the onset of exposure. VOC's undergo biotransformation or they accumulate in the lipid-rich tissues such as those of the nervous system.

VOC inhalation by workers may cause effects ranging from an alcohol-like intoxication to narcosis and death from respiratory failure, with a spectrum of intermediate symptoms that include drowsiness, headache, dizziness, dyspepsia, and nausea. The acute effects of VOC inhalation include narcosis, anesthesia, CNS depression, respiratory arrest, unconscious, and death.

#### 3.1.2 Semi-volatile organic compounds

The most common semi-volatile organic compounds are polynuclear aromatic hydrocarbons (PNAs, PAHs, polycyclic-, or semi-volatiles) are various combinations of three or more closed (benzene) rings, together with attached molecular structures. They occur naturally in coal, petroleum, tars, pitches, and woods, and may be formed in fires involving heavy hydrocarbon materials.

Examples of PAHs, or PNAs, are anthracene, benzo(a)pyrene, chrysenes, fluoranthcene, naphthacene, and pyrenes, among many others. Many of the PAHs are carcinogenic. As a class they should be treated as carcinogens and exposures kept to a minimum. There is no OSHA permissible exposure limit for most of the specific compounds. PAHs are generally solids and not very volatile, making dust or smoke the likely route of exposure.

#### 3.1.2.1 Polynuclear Aromatic Hydrocarbons

Polynuclear aromatic hydrocarbons (PNAs, PAHs, polycyclic-, or semi-volatiles) are various combinations of three or more closed (benzene) rings, together with attached molecular structures. They occur naturally in coal, petroleum, tars, pitches, and woods, and may be formed in fires involving heavy hydrocarbon materials.

Examples of PAHs, or PNAs, are anthracene, benzo(a)pyrene, chrysenes, fluoranthcene, naphthacene, and pyrenes, among many others. Many of the PAHs are carcinogenic. As a class they should be treated as carcinogens and exposures kept to a minimum. There is no OSHA permissible exposure limit for most of the specific compounds; PAHs are generally solids and not very volatile, making dust or smoke the likely route of exposure.

#### 3.1.2.2 BTEX

Petroleum is a highly complex mixture of aliphatic and aromatic hydrocarbons. Benzene, toluene, xylene and ethylbenzene are natural but minor components of fuel oils, kerosene and diesel fuels. Gasoline contains higher quantities of these aromatic hydrocarbons.

Exposure to the vapors of benzene, ethylbenzene, toluene and xylenes above their respective permissible exposure limits (PELs) as an 8-hr time weighted average (TWA) may produce irritation of the mucous membranes of the upper respiratory tract, nose and mouth. Overexposure may also result in the depression of the central nervous system. Symptoms of such exposure include drowsiness, headache, fatigue and euphoria. Chronic and prolonged overexposure to the vapors of benzene may cause damage to the blood-forming organs and is known to cause leukemia in humans.

The PELs for ethylbenzene and xylene are 100 ppm. The PEL-TWA for toluene is 200 ppm. The 2007 American Conference of Governmental Industrial Hygienists (ACGIH) have recommended a threshold limit value of 20 ppm for toluene. The PEL for benzene is 1 ppm and the STEL is 5 ppm.

### 3.1.3 Metals

As a group, the heavy metals (including lead, arsenic, chromium, nickel, cadmium, and selenium) are toxic to a number of organs and organ systems in the body, including the liver, kidneys, blood-forming organs (primarily located in the bones), and the central nervous system (CNS) (especially lead). Acute exposure to metals can produce such symptoms as stomach distress and vomiting, mental confusion and sluggishness, heart palpitations, breathing difficulties, and renal (kidney) failure. Chronic exposures can be characterized by deterioration in function of the liver and kidneys, CNS degradation, and abnormal changes in blood cell counts (especially white blood cells). Exposure to chromium may also lead to formation of lung and gastric cancers.

The primary route of exposure to metals of concern during this project is contact with contaminated soil, which can lead to entry through open wounds or contamination and ingestion of food. Preventing this route of exposure necessitates the use of dust control measures, administrative controls (e.g., no consumption of food/beverages in the work area or smoking/chewing tobacco), chemically-protective gloves, and decontamination procedures.

Common toxic metals found at industrial sites include: Arsenic, Cadmium, Chromium, Lead, Mercury, Nickel, Silver and Zinc.

Many of these metals are required in trace amounts for normal human metabolic process. Harmful health effects generally begin at levels from 10-15 times the Recommended Daily Amount (in the 1 to 250 mg/day range). Doses in this range can cause irritability, hypertension, stomach cramps, nausea, and vomiting.

Breathing large amounts of the metals (as dust or fumes) can cause a specific short-term disease called metal fume fever. This is believed to be an immune response affecting the lungs and body temperature.

Metals are generally solids, making ingestion and inhalation (fumes, dust, or smoke) the likely routes of exposure.

#### 3.2 Hazard Substances Brought On Site by AECOM

A material safety data sheet (MSDS) must be available for each hazardous substance that AECOM or its contractors bring on the property. This includes solutions/chemicals that will be used to decontaminate sampling equipment and gases needed to calibrate air monitoring equipment.

In addition, all containers of hazardous materials must be labeled in accordance with OSHA's Hazard Communication Standard. Either the original manufacturer's label or an NFPA 704M label specific for the material is considered to be an acceptable label.

#### 3.2.1 Sample Container Preservatives

Preservatives including hydrochloric acid, nitric acid, sulfuric acid, zinc acetate, and sodium hydroxide may be encountered during sampling activities. Safe and proper handling techniques are to be used when collecting samples. Individuals should work upwind from the open sample keeping the bottle away from the breathing zone (approximately one arm's length) to minimize potential exposure. Personnel should be aware of any changes in wind direction that may also affect potential for exposure to vapors. Gloves and safety glasses will always be worn when handling sample containers and collecting samples. Sample vessel seals should be immediately replaced after sample is gathered. Should any

sample preservatives come in contact with skin, the exposed area should be thoroughly irrigated with fresh water immediately.

#### 3.3 Chemical Exposure and Control

#### 3.3.1 Chemical Exposure Potential

Employees can be exposed via direct dermal contact with contaminated soils, sediments, and groundwater during screening and sampling or while handling contaminated equipment. Additionally, exposure could occur via ingestion (hand-to-mouth transfer). The inhalation pathway poses little risk based upon low concentrations and limited pathways for routes of exposure (i.e. groundwater). However, safe work procedures and real time air monitoring will be implemented to assess this pathway during intrusive activities. The required PPE and decontamination procedures described in Section 7.0 address personal hygiene issues that will limit the potential for dermal exposure and ingestion.

#### 3.3.2 Chemical Hazard Control

The first line of defense is to implement best work practices and engineering controls to eliminate or mitigate exposures. PPE is the secondary choice of protection when exposures can't be eliminated or otherwise mitigated. During soils screening and intrusive activities, air monitoring (Section 6) will be conducted in the worker's breathing zone to determine exposure to the chemicals of concern.

#### 3.3.2.1 Engineering Controls

- Ventilation of the well head and/or vault for adequate enough amount of time to allow accumulated vapors to dissipate.
- The use of water spray to control dust emissions to control potential releases or contact with contaminated material.

#### 3.3.2.2 Administrative Controls

- Distance between worker and actual contaminated area, i.e., placing heavy equipment on clean side during certain activities to provide some measure of remoteness to the operation.
- Staying upwind from contaminant emissions.
- Ensuring only essential personnel are in work areas.

#### 3.3.2.3 Personal Protective Equipment (PPE)

- Use of respiratory and dermal protection as required.
- Use of protective clothing to avoid direct dermal contact with contaminated media when collecting samples and decontaminating sampling equipment.
- Use of protective clothing to avoid direct dermal contact with potential hazards associated with maintenance/repairing chemical induction apparatus, bulk chemical deliveries.

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vehicle. Under NO CIRCUMSTANCES is driving and talking without a "hands free" device acceptable while operating a motor vehicle on company business.

#### Secure Packing

Do not move your vehicle unless all equipment and supplies are secured. Items and material that may roll, slide, or move about in your vehicle while traveling are a major hazard. Secure the load!

#### **Emergency Procedures:**

Always move out of traffic if possible; even if those in front of you have stopped. Stopping on an active highway can precipitate being hit from the rear. If you must stop on an active roadway, leave at least one car length in front of you, and watch the rear mirror, so you can ease up if someone behind can't stop. Keep your flashers on in this situation. If you are the only driver coming to a stop on an active roadway, leave the flashers on and when safe to do so, exit the car and get to a safe location.

If you must stop due to vehicle failure, etc. try to coast out of traffic. Put on your flashers, and tie a white handkerchief, etc. on the driver's side door or mirror. If you remain in the vehicle, lock the doors. Use your cell phone to summon help.

#### 4.16 Harmful Flora and Fauna

For a more detailed level of protection from poisonous plants and insects, AECOM employees must review and comply with SH&E 509 - Biological Hazards.

#### Biological Hazards Assessment

Contact with animals, insects, and plants can cause injury and illness to personnel. Care must be taken to ensure that these types of injuries are avoided. Some examples of biological hazards include:

- 1. Wild animals, such as snakes, raccoons, squirrels, and rats. These animals not only can bite and scratch, but can carry transmittable diseases (e.g., rabies). Avoid the animals whenever possible. If bitten, go to the nearest medical facility.
- 2. Insects such as mosquitoes, ticks, bees, and wasps. Mosquitoes can potentially carry and transmit the West Nile Virus. Ticks can transmit Lyme disease or Rocky Mountain Spotted Fever. Bees and wasps can sting by injecting venom, which causes some individuals to experience anaphylactic shock (extreme allergic reaction). Whenever you will enter areas that provide a habitat for insects (e.g., grass areas, woods), wear light-colored clothing, long pants and shirt, and spray exposed skin areas with a DEET-containing repellent. Keep away from high grass wherever possible. Keep your eyes and ears open for bee and wasp nests. If bitten by insects, see a doctor if there is any question of an allergic reaction.
- 3. Plants such as poison ivy and poison oak can cause severe rashes on exposed skin.

Poison ivy, poison oak, and poison sumac release an oil, urushiol, when the leaf or other plant parts are bruised, damaged, or burned. When the oil gets on the skin an allergic reaction, referred to as contact dermatitis, occurs in most exposed people as an itchy red rash with bumps or blisters. When exposed to 50 micrograms of urushiol, an amount that is less than one grain of table salt, 80 to 90 percent of adults will develop a rash. The rash, depending upon where it occurs and how broadly it is spread, may significantly impede or prevent a person from working. Although over-the-counter topical medications may relieve symptoms for most people, immediate medical attention may be required for severe reactions, particularly when exposed to the smoke from burning these poisonous plants. Burning these poisonous plants can be very dangerous because the allergens can be inhaled, causing lung irritation.

Workers can prevent contact with poisonous plants by taking these steps:

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#### 4.0 PHYSICAL HAZARDS AND CONTROLS

#### 4.1 Drilling Operations

Drilling operations, including hollow-stem, rotary and/or direct push drilling, present their own set of hazards. Several basic precautions that should be taken include, but are not limited to, confirming locations of underground and overhead utilities, wearing of appropriate PPE and the avoidance of loose clothing or jewelry, staying clear of moving parts, knowing the locations of emergency shut-off switches. Other operational safety precautions regarding moving the drilling equipment, raising and lowering the derrick(mast), and drilling can be found in *SH&E 716, Drilling and Boring.* 

#### 4.2 Slips, Trips, Falls, and Protruding Objects

A variety of conditions may exist that may result in injury from slips, trips, falls, and protruding objects. Slips and trips may occur as a result of wet, slippery, or uneven walking surfaces. To prevent injuries from slips and trips, always keep work areas clean; keep walkways free of objects and debris; and report/clean up liquid spills. Serious injuries may occur as a result of falls from elevated heights. Always wear fall protection while working at heights of 6 feet or greater above the next lower level.

Protruding objects are any object that extends into the path of travel or working area that may cause injury when contacted by personnel. Always be aware of protruding objects and when feasible remove or label the protruding object with an appropriate warning. On any work area, it is expected that or on top of debris or trash piles. When carrying equipment, identify a path that is clear of any obstructions. The ground surface might be uneven or unreliable due to settling. Surface debris might be present and wet or swampy areas can exist. *Always utilize roads, pathways, or other designated routes or travel. Do not take shortcuts*.

Employees should walk around, not over might be necessary to remove obstacles to create a smooth, unobstructed access point to the work areas on site.

During the winter months, snow shovels and salt crystals or calcium chloride should be kept on site to keep work areas free of accumulated snow and ice. Furthermore, use sand or other aggregate material to help keep work surfaces from being slippery, especially where salt/calcium chloride cannot be used. In addition, make sure work boots have soles that provide good traction. When walking on ice is necessary crampons or Yaktrax® should be used.

Maintaining a work environment that is free from accumulated debris is the key to preventing slip, trip and fall hazards at construction sites. Essential elements of good housekeeping include

- Orderly placement of materials, tools and equipment;
- Placing trash receptacles at appropriate locations for the disposal of miscellaneous rubbish;
- Prompt removal and secure storage of items that are not needed to perform the immediate task at hand; and,
- Awareness on the part of all employees to walk around, not over or on, equipment that might have been stored in the work area.

#### 4.3 Housekeeping

During site activities, work areas will be continuously policed for identification of excess trash and unnecessary debris. Excess debris and trash will be collected and stored in an appropriate container (e.g., plastic trash bags, garbage can, roll-off bin) prior to disposal. At no time will debris or trash be intermingled with waste PPE or contaminated materials. Additional information on the requirements of housekeeping can be found in SH&E 104, *General Housekeeping*.
#### 4.4 Spill Prevention

Work activities may involve the use of hazardous materials (i.e. fuels, solvents) or work involving drums or other containers. The following procedures will be used to prevent or contain spills:

- All hazardous material will be stored in appropriate containers
- Tops/lids will be placed back on containers after use.
- Containers of hazardous materials will be stored appropriately away from moving equipment.

At least one spill response kit, to include an appropriate empty container, materials to allow for booming or diking the area to minimize the size of the spill, and appropriate clean-up material (i.e. speedy dri) shall be available at each work site (more as needed).

- All hazardous commodities in use (i.e. fuels) shall be properly labeled.
- Containers shall only be lifted using equipment specifically manufactured for that purpose.
- For drums/containers, follow the procedures in SH&E 608, *Handling Drums and Large Containers*, to minimize spillage.

#### 4.5 Utility Hazards

#### 4.5.1 Underground Utilities

AECOM employees must review and comply with AE SH&E 726 – Identifying Underground Utilities. Each "person" as defined in the Underground Utility Damage Prevention Act must provide their own notice of excavation to request a mark-out of natural gas, electric, telephone, cable television, water and sewer lines in the proposed drilling locations.

Allow required time for marking - Begin excavation only after checking with the Athens Utility Board. Excavation may begin when: All notified utilities have either marked their lines or reported that they have no facilities in the area of excavation OR the marking period has expired (after 7:00 AM on the third working day after notice to the center.)

Respect the marks - Protect and preserve the markings from the time excavation begins until the work is completed. Call the utility services and request the utility to be re-located if the marks become illegible due to time, weather, construction or any other cause.

Excavate carefully - If the excavation is within 2 feet of a marked utility line, expose the utility line by hand digging and keep all mechanized equipment at least 2 feet away from the extremities of the utility. Work will not begin until the required utility clearances have been performed.

Utility clearance organizations typically do not mark-out underground utility lines that are located on private property. As such, the drilling contractor must exercise due diligence and try to identify the location of any private utilities on the property being investigated. AECOM can fulfill this requirement in several ways, including:

- Obtaining as-built drawings for the areas being investigated from the property owner;
- Visually reviewing each proposed soil boring locations with the property owner or knowledgeable site representative;
- Performing a geophysical survey to locate utilities;
- Hiring a private line locating firm to determine the location of utility lines that are present at the property;
- Identifying a no-drill zone; or
- Hand digging in the proposed soil boring locations if insufficient data is available to accurately determine the location of the utility lines.

#### 4.5.2 Overhead Utilities

AECOM employees must review and comply with SH&E 727 – Overhead Electrical Lines. All overhead lines will be considered "energized" unless properly de-energized, grounded and tested by the utility company before working within the clearance distance as defined below. The AECOM SSO must observe de-energizing process and reconfirm that the lines are de-energized on a daily basis.

Any vehicle or mechanical equipment that is capable of having parts of its structure elevated near energized overhead lines shall be operated so that a minimum clearance of 10 feet is maintained at all times. This 10 foot distance shall be increased a minimum of 0.4 inches for each 1 kV over 50 kV. <u>If the voltage of the overhead line is unknown, maintain a clearance distance of 35 feet from ground projection of the nearest power line to the vehicle.</u> Any work within the clearance distance must be approved by the Regional Health and Safety Manager and the utility company.

Line Voltage (Kilovolts) Minimum Safe Working Distance

| 0 - 50 = 10 feet     | >350 – 500 = 25 feet  |
|----------------------|-----------------------|
| >50 – 200 = 15 feet  | >500 – 750 = 35 feet  |
| >200 – 350 = 20 feet | >750 – 1000 = 45 feet |

Precautions must be taken when handling lengths of pipe or tubing that can approach overhead power and utility lines. When working with pipe or tubing, maintain a distance equal to the length of pipe plus the clearance distance defined above.

#### 4.6 Site Surveys and Utility Locates

Site surveys and utility locates will be performed by AECOM subcontractors of third party representatives of utility companies. These personnel may be allowed to work on site outside the requirements of this HASP only if escorted at all times by fully qualified AECOM or subcontractor employees assigned to work at the site and only if they are not exposed to hazards at the site.

#### 4.7 Noise Exposure

AECOM employees must review and comply with SH&E 113 – Hearing Conservation Program. The use of heavy equipment or noise producing tools can expose the field team to noise levels that exceed the OSHA PEL of 90 dB for an 8-hour day. Exposure to noise can result in the following:

- Temporary hearing losses where normal hearing returns after a rest period;
- Interference with speech communication and the perception of auditory signals;
- Interference with the performance of complicated tasks; and,
- Permanent hearing loss due to repeated exposure resulting in nerve destruction in the hearing organ.

Since personal noise monitoring will not be conducted during the proposed activities, employees must follow this general rule of thumb: If the noise levels are such that you must shout at someone 5 feet away from you or you are within 25 ft of operating heavy equipment, you need to be wearing hearing protection. Employees can wear either disposable earplugs or earmuffs but all hearing protection must have a minimum noise reduction rating (NRR) of 24 dB.

#### 4.8 Dust

Dust generated during site activities can be hazardous to the respiratory system and irritating to the eyes. Dust can also carry the contaminants of concern potentially exposing workers by skin contact and inhalation. The ACGIH has established an eight-hour exposure limit for dust at 3 mg/M<sup>3</sup>. Additionally, contamination of skin and clothing can provide additional exposures. Therefore the generation and contact with dust should be minimized. Water or other methods should be used to control dust during dusty operations; however care must be used to prevent electrical shock if electric tools are used in the same area.

#### 4.9 Drum Handling

AECOM employees must review and comply with SH&E 608 – Handling Drums & Large Containers. Accidents may occur during handling of drums and other containers. Hazards include physical injury resulting from moving heavy containers by hand and working around stacked drums, and deteriorated drums. When working around or with drums:

- Have a dry chemical fire extinguisher on hand to control small fires.
- Inspect drums at least weekly: check for labels, markings, etc., and note conditions of containers. Are the drums bulging, deteriorated, or leaking? If labels are not legible, replace them. If the drums are deteriorated or leaking, initiate emergency response and cleanup efforts.
- Before moving any drum or container, determine the most appropriate sequence in which the various containers should be moved, the destination, and clear route to the destination.
- Do not move drums that are not intact or tightly sealed.
- Pressurized drums are extremely hazardous. If possible, do not move drums that may be under internal pressure as evidenced by bulging or swelling.
- Use the following types of equipment to move drums and/or containers: 1) drum grappler attached to a hydraulic excavator, 2) small front-end loader with a bucket sling, 3) rough terrain fork lift, or 4) drum cart.
- Have over packs ready before any attempt is made to move drums containing hazardous wastes or chemicals.
- If the drum contents or origin are not known, do not open or move the drum. Notify your project manager and Regional Health and Safety Manager.
- Never stand on drum tops.

#### 4.10 Cuts and Lacerations

#### 4.10.1 Cutting Tools

Direct push soil samples are collected in acetate liners that must be cut open in order to collect the sample. Additionally, tubing will need to be cut to facilitate groundwater sampling. Tube-cutters are available and should be used to eliminate this hazard. Secure the acetate liner so it won't roll or move while you are cutting. **Cutting tools must be designed for the specific task and must be safety cutting devices equipped with a completely enclosed and/or guarded blade.** If it is necessary to use knives or blades, follow the safety precautions listed below:

If it is necessary to use knives or blades, follow the safety precautions listed below:

- Keep your free hand out of the way
- Use only sharp blades; dull blades require more force, which results in less knife control
- Pull the knife at an angle to your body; pulling motions are easier to manage

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- Don't put your knife in your pocket
- Use a hooked knife (i.e. linoleum knife) or a utility knife with a self-retracting blade
- Wear leather or Kevlar® gloves when using cutting tools.

#### 4.10.2 Working with Glassware

Glass bottles, laboratory equipment, and VOA vials can break and cause lacerations and puncture wounds. The follow preventive measures should be taken to reduce the potential for broken glassware.

- Package all glassware such that there is no glass to glass contact during transportation or storage;
- Assume that any time glass strikes another object it is damaged;
- Inspect all glassware for cracks, scratches, and other damage before using;
- Lids and caps should be "finger tight" unless there is a torque specification and you use a torque wrench;
- Never fill a glass container (other than VOA vials with a septum) liquid full, always leave an air space to buffer thermal expansion of the liquid; and
- Avoid rapid temperature changes when filling glass containers.

Glass often has flaws that cannot be detected by visual inspection and the force needed to open and tighten lids can cause these flaws to fracture the glass. Any time force above "finger tight" is applied to lids or caps, or any force is applied directly to glass, workers should wear leather or preferably Kevlar® gloves. Kevlar® glove liners are available for use under Nitrile or cotton gloves.

#### 4.11 Back Safety

Using the proper techniques to lift and move heavy pieces of equipment is important to reduce the potential for back injury. The following precautions should be implemented when lifting or moving heavy objects:

- Use mechanical devices to move objects that are too heavy to be moved manually
- If mechanical devices are not available, ask another person to assist you.
- Bend at the knees, not the waist. Let your legs do the lifting.
- Do not twist while lifting
- Bring the load as close to you as possible before lifting
- Be sure the path you are taking while carrying a heavy object is free of obstructions.

#### 4.12 Hand Augering

In addition to the precautions listed in the Back Safety discussion below, additional care should be taken to prevent injuries when using hand augers.

- When practical, work as a team of two to advance borings with a hand auger.
- Do not apply excessive force to turn the auger or twist & turn your back in an effort to advance the auger.
- Wear cotton or leather gloves when rotating the auger.
- Avoid putting pressure on the palms of your hands; use a good grip to spread the pressure over the entire hand.

- Take frequent stretch breaks to stretch and relax your back, arms and hands.
- Use caution when transporting or decontaminating auger, as they can be bulky and have an irregular length and shape.
- Utilize hard hats when operating and decontaminating augers with "extensions" added.

#### 4.13 Hand Safety

#### 4.13.1 Glove Selection

Gloves should be selected to afford protection from a variety of hazards to protect onsite workers from hand injuries, the following gloves will be used for when performing a specific duty:

- Leather gloves for general protection, cushioning, or abrasion/laceration protection
- Nitril gloves for dermal protection from general chemical hazards
- Insulated gloves or Thermax glove liners as appropriate in cold weather
- Insulated gloves when working w/ electrical hazards
- Vibration dampening gloves when utilizing vibrating/gyrating saws, hammers, or other equipment
- Specialty gloves as appropriate: Rubber/Chemical Specific, Waterproof, added grip, filet gloves, etc.

Wear the right gloves or combination of gloves for the hazard and be sure to get the proper size gloves for all employees. Be sure to remove jewelry prior to work to avoid catching on equipment or creating pinch points.

Pinch points are found between a moving object and a stationary object, or between two continuously moving objects. Yellow hand stickers will be placed on equipment to remind workers of pinch points.

#### 4.13.2 Hand Tools

Rules for the safe use of hand tools:

- Select the right size tool for the job. Don't use "cheaters" and avoid pulling old tools from the waste stream. There's a reason why they were thrown away!
- All hand tools must be in safe condition.
- Handles must be sound, straight and tight-fitting.
- Always inspect tools before use and replace or repair worn or damaged tools.
- Always keep the cutting edges sharp and never test a cutting edge with your finger.
- When working on an elevated surface (ladder, truck, scaffold), ensure your tools are secure. Falling tools can cause serious injury.
- Always carry your tools correctly and never put sharp or pointed tools in your pocket.
- When carrying hand tools, always point the cutting edge to the ground.
- Always keep your tools in a dry place to prevent rust.
- Cutting tools must be kept sharp and properly shaped.
- Secure work pieces prior to cutting or drilling.
- Keep the unused hand and other people away from the tool.

#### Use the following types of tools while working:

#### Screwdrivers:

Most screwdrivers are not designed to be used on electrical equipment. Use an insulated screwdriver for electrical work. No work will be performed by an AECOM employee that exposes the employee to greater than fifty volts.

Do not hold an object in the palm of one hand and press a screwdriver into it; place the object on a bench or table. Never hammer with a screwdriver. Never use a screwdriver with a broken handle, bent or burred blade, etc.

#### Pliers:

Do not use pliers as a substitute for hammers, wrenches, pry bars, etc. Use insulated pliers when doing electrical work. Inspect the pliers frequently to make certain that they are free of breaks or cracks.

Use the right type of pliers for the specific task – adjustable, locking (Vise Grip®), standard, bolt size fit, pipe wrench.

#### Hammers:

Use the correct hammer for the specific type of striking work (task) to be done. Always wear safety glasses when using a hammer to strike an object. Always use the claw portion of a hammer to remove nails and not as a pick or awl. Have an unobstructed view and swing when using a hammer. Watch for overhead interference on back and forward swing. Use a good grip and use something other then your hand to hold a nail when starting hammering. Check for defects on the handle and head before using. If the hammer head shows signs of mushrooming, replace it immediately.

Handles may be wood, tubular/solid steel or fiberglass. Replace any hammer with a loose handle before the head flies off and causes injury to you or someone else. Tighten loose handles with the proper wedges; never use nails or staples for wedges. If a steel or fiberglass handle is loose replace it, since it is more difficult to repair than a wooden one. Some fiberglass handles can be tightened with the aid of a repair kit with epoxy materials.

#### Wrenches:

Select the correct size of wrench for the job. Never use a pipe wrench as a wrench handle extension. Too much leverage can ruin a tool and cause injury.

To avoid sudden slips, stand in a balanced position and always pull on the wrench instead of pushing against the fixed jaw, particularly when a pinch point is created. Wear gloves when using a wrench in a confined space.

Whenever possible use a box end wrench instead of an open end wrench to avoid slipping.

#### Chisels:

A screwdriver is not a chisel. Always wear safety goggles or a face shield when using a chisel. Drive chisels outward and away from your body. Do not use chisels to pry. Keep edges sharp for most effective work and protect when not in use. Driven tools (chisels, punches, etc.) must be dressed to remove any mushrooming. Use the proper hammer when using a chisel.

#### Cutting Tools:

Cutting tools must be designed for the specific task and must be safety cutting devices equipped with a completely enclosed and/or guarded blade. Always perform a thorough Job Safety Analysis (JSA) to define the proper cutting tool for the task.

Always place the item to be cut on a solid surface, attempt to hold the cut item without your hand and cut in a direction away from the body and hand.

Always keep hands and body clear of the knife stroke. Always keep the cutting tool blades sharp.

Make sure there is plenty of open space around you when using any cutting tool.

Use the following safer tools in replace of FOBK:

- Tubing cutters
- Self-retracting utility knives
- Guarded utility knives
- Shears, snips, and/or scissors
- Concealed blade cutters
- Pipe cutters
- Specialty cutters (e.g. Geoprobe Acetate Liner Cutter)
- Ratcheting tools

#### 4.14 Traffic Safety

#### Basic Procedures

To make certain that motorists are aware of our presence, all employees who are potentially exposed to traffic hazards should **wear orange or yellow ANSI Class II or III safety vests**. <u>Work area should be delineated</u> with traffic cones, or other suitable warning barriers, to prevent motorists from inadvertently driving through. As for vests, cones or other barrier materials should be reflectorized if work will be performed during dusk or evening hours. Where it is not feasible to implement such procedures, a standby observer should be assigned to warn the work crew of any impending traffic hazards.

#### 4.15 Driving Safety

AECOM employees must review and comply with SH&E 107 – Driver & Vehicle Safety. Drivers must be licensed to drive the class of vehicle they are operating and trained in defensive driving. Only AECOM personnel may drive AECOM vehicles or vehicles rented for AECOM business; client, subcontractor, or other work-related personnel may ride. Drivers and passengers must comply with all traffic laws and posted signs, and will not operate a vehicle if under the influence of impairing medication, alcohol, or any other substance.

#### Planning / Preparation

- Prior to departure, check traffic reports, weather conditions, road construction, and road closures. If necessary, develop an alternative route and new, approved JMP (Journey Management Plan).
- Prior to entering the vehicle, inspect the vehicle.
- Leave early to allow for contingencies.

#### Distractions

AECOM employees must review and comply with SH&E 107 – Driver & Vehicle Safety. You must make every attempt NOT to operate a vehicle while talking on your cell phone, regardless of "hands free" or not. If you receive a call; attempt to pull over to answer it, or pull over and return the call. Although "hands free" is allowed, it is not encouraged. Do NOT allow other distractions to interfere with your safe operation of the

- Identify areas where you are working that have poisonous plants and mitigate exposure to them by delineation of their boundaries with flagging, marking paint, etc. or covering them with visqueen or drop cloths.
- Wear long sleeves, long pants, boots, and gloves.
  - Wash exposed clothing separately in hot water with detergent.
- Barrier skin creams, such as a lotion containing bentoquatum, may offer some protection before contact.
  - Barrier creams should be washed off and reapplied twice a day.
- After use, clean tools with rubbing alcohol (isopropanol or isopropyl alcohol) or soap and lots of water. Urushiol can remain active on the surface of objects for up to 5 years.
  - $\circ$   $\;$  Wear disposable gloves during this process.
  - Do not burn plants that may be poison ivy, poison oak, or poison sumac.
    - Inhaling smoke from burning plants can cause severe allergic respiratory problems.

Employers should prevent workers from being exposed to burning poisonous plants whenever possible. However, when exposure to burning poisonous plants is unavoidable, employers should provide workers with:

- A NIOSH-certified half-face piece particulate respirator rated R–95, P–95, or better. This recommendation does NOT apply to wildland firefighters. Firefighters may require a higher level of respiratory protection to protect against possible exposure to combustion products.
- These respirators should protect against exposure to burning poisonous plants, but will not protect against all possible combustion products in smoke, such as carbon monoxide.
- Respirators must be worn correctly and consistently throughout the time they are used.
- For respirators to be effective there must be a tight seal between the user's face and the respirator.
- Respirators must be used in the context of a written comprehensive respiratory protection program (see OSHA Respiratory Protection standard 29 CFR 1910.134, or www.osha.gov/SLTC/respiratoryprotection/index.html).

Be careful where you walk, wear long pants, and minimize touching exposed skin with your hands after walking through thickly vegetated areas until after you have thoroughly washed your hands with soap and water.

#### 4.17 Weather

The Site Safety Officer will check the weather forecast for the project area each morning prior to mobilization. Predicted weather conditions will be included in the Job Safety Analysis. Weather changes should initiate a review and update of the JSA as necessary.

Severe weather can occur with little warning. The employee must be aware of the potentials for lightning, flash flooding and high wind events.

#### Be Prepared, Know What is Coming your Way

- Listen to the radio for severe weather alerts.
- Check the Storm Prediction Center's web page for alerts and warnings.

http://www.spc.noaa.gov/products/wwa/

- Pay attention to the weather in your area, up wind of your location, and in the watershed up stream from your location.
- When in the field, be aware of the route you must take to get to shelter.
- When working in low areas be aware of the potential for flash flooding and the route to higher ground.

#### 4.17.1 Lightning

Lightning can strike up to a distance of 10 miles from the source cloud, but thunder can only be heard at a distance of 8 miles. Therefore, if site personnel working outdoors hear thunder and/or see lightning, work will be stopped and personnel will move to an indoor location.

If a storm comes up suddenly and you are outdoors, seek the best shelter you can find. If choosing between a building and a car, choose the building. If you're in a car, keep the windows closed. If there is no shelter, find a low-lying, open place that is a safe distance from trees, poles or metal objects that can conduct electricity. Make sure it is an area that is not likely to flood! Remember, lightning does not necessarily strike the tallest object; it will strike the best conductor on the ground, which might be a human being. Assume a tucked position and squat low to the ground. Place your hands on your knees with your head tucked between them. Try to touch as little of your body to the ground as possible and keep your feet touching each other. If you feel your hair stand on end in a storm, drop into a tucked position immediately. This sensation means electric charges are already rushing up your body from the ground toward an electrically charged cloud.

Work will resume 30 minutes following the final observance of thunder and/or lightning.

#### 4.17.2 Tornados and High Wind

#### Outdoors:

Abandon vehicles and temporary buildings. A tornado can move faster than you can drive.

**Find shelter!** The danger in a tornado or high winds is flying debris including trees, vehicles and temporary buildings.

Find shelter in a ditch or other location that will protect you from winds coming from all directions. Bridges and overpasses offer little protection and should be the last choice for shelter; the space where the bridge abutment and the bridge meet is better than no shelter on open ground.

#### Indoors:

Get as many walls between you and the storm as you can, if you can see a window you are not in a shelter.

- Interior restrooms, stairwells and closets offer protection.
- Basements and underground shelters offer the best protection.

Never watch a nearby tornado either outside or through a window. Large tornadoes can blow airborne debris up to a mile from the funnel.

#### 4.17.3 Heat/Cold Stress

Detailed procedures on mitigating heat and cold stress are outlined in SH&E SOP 615 – Cold Stress Prevention and SH&E SOP 616 - Heat Stress Prevention.

#### Measures to Avoid Heat Stress:

The following guidelines should be adhered to when working in hot environments:

- Establish work-rest cycles (short and frequent are more beneficial than long and seldom).
- Identify a shaded, cool rest area.
- Rotate personnel, alternative job functions.

- Water intake should exceed sweat produced. Most workers exposed to hot conditions drink less fluids than needed because of an insufficient thirst. DO NOT DEPEND ON THIRST TO SIGNAL WHEN AND HOW MUCH TO DRINK. Consume enough liquid to force urination every two hours. In humid climates ice water or ice should be consumed to help maintain normal body temperature since evaporation does not provide an efficient mechanism for heat removal.
- Eat light meals before and during work shifts. Avoid highly salted foods.
- Drink sports drinks such as Gatorade® diluted 1:1 with water.
- Save most strenuous tasks for non-peak heat hours such as the early morning or at night.
- Avoid alcohol during prolonged periods of heat. Alcohol will cause additional dehydration.
- Avoid double shifts and/or overtime.

The implementation and enforcement of the above mentioned measures will be the joint responsibility of the Project Manager and health and the Site Safety Officer. Potable water and fruit juices should be made available each day for the field team.

#### Methods to Prevent Cold Stress

When the ambient temperature, or a wind chill equivalent, falls to below  $40^{\circ}$  F (American Conference of Governmental Industrial Hygienists recommendation), site personnel who must remain outdoors should wear insulated coveralls, insulated boot liners, hard hat helmet liners and insulated hand protection. Wool mittens are more efficient insulators than gloves. Keeping the head covered is very important, since 40% of body heat can be lost when the head is exposed. If it is not necessary to wear a hard hat, a wool knit cap provides the best head protection. A facemask may also be worn.

Persons should dress in several layers rather than one single heavy outer garment. The outer piece of clothing should ideally be wind and waterproof. Clothing made of thin cotton fabric or synthetic fabrics such as polypropylene is ideal since it helps to evaporate sweat. Polypropylene is best at wicking away moisture while still retaining its insulating properties. Loosely fitting clothing also aids in sweat evaporation. Denim is not a good protective fabric. It is loosely woven, which allows moisture to penetrate. Socks with high wool content are best. If two pairs of socks are worn, the inner sock should be smaller and made of cotton, polypropylene or similar types of synthetic material that wick away moisture. If clothing becomes wet, it should be taken off immediately and a dry set of clothing put on.

If wind conditions become severe, it might become necessary to shield the work area temporarily. The SSO and the PM will determine if this type of action is necessary. Heated break trailers or a designated area that is heated should be available if work is performed continuously in the cold at temperatures, or equivalent wind chill temperatures, of 20° F.

Dehydration occurs in the cold environment and can increase the susceptibility of the worker to cold injury due to significant change in blood flow to the extremities. Drink plenty of fluids, but limit the intake of caffeine. AECOM employees must review and comply with SH&E 615 – Cold Stress Prevention.

#### 4.18 Confined Spaces

No confined spaces are known to be present in the work area addressed in this scope of services. No confined space entry is permitted under this scope of work.

#### 5.0 AIR MONITORING

#### 5.1 Monitoring Equipment

#### Photoionization Detector

As a precautionary measure, a Photoionization Detector (PID) with a minimum 10.2 ev lamp will be used to monitor the breathing zone of personnel during the proposed activities. If the PID indicates sustained (5 minute) breathing zone vapor concentrations in excess of 15 ppm as isobutylene, employees are to stop work and contact with the SH&E department is required.

| Task   | Instrument               | Stop Work Action Limit and Action  |
|--|--------------------------|--|
| All tasks involving<br>potential exposure to<br>contaminated soils<br>and/or groundwater | Photoionization Detector | 15 ppm as isobutylene<br>(sustained 5 minutes in BZ)   |
|  |                          | Contact SH&E Professional. Follow<br>Action Levels and Monitoring<br>Procedures in Table 5.1 |

#### 5.2 Personal Air Sampling

After review of the most recent analytical data, the need for personal air sampling is not anticipated by AECOM during the activities covered by this HASP. The AECOM Project Manager, or the AECOM Regional Health and Safety Manager can prescribe personal air sampling based on observations or concerns recognized during the project.

#### 5.2.1 Health and Safety Action Levels

An action level is a point at which increased protection is required due to the concentration of contaminants in the work area or other environmental conditions. The concentration level (above background level) and the ability of the PPE to protect against that specific contaminant determine each action level. The action levels are based on concentrations in the Breathing Zone.

If ambient levels are measured that exceed the action levels in areas accessible to unprotected personnel, necessary control measures (barricades, warning signs, and mitigative actions, etc.) must be implemented prior to commencing activities at the specific work area. Table 5-1 below provides the appropriate action level and action to afford respiratory protection to on-site workers.

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AECOM Job No. 60138541

| Table 5-1: | Action | Levels | and | Monitoring | Procedures |
|------------|--------|--------|-----|------------|------------|
|------------|--------|--------|-----|------------|------------|

| Parameter                               | Zone Location<br>and Monitoring<br>Interval      | Response Level<br>(Above Background)                        | Response Activity  |
|---|--|---|--|
| VOCs<br>(total by PID<br>with a 10.6 eV | Breathing Zone,<br>every 15-30<br>minutes during | < 5 ppm   | Continue work in required PPE, station<br>personnel up-wind, and continue<br>monitoring.   |
| bulb)                                   | drilling activities                              | 5-15 ppm (sustained in BZ<br>for more than 5 minutes)       | Continue work in required PPE, continue<br>monitoring. Implement engineering<br>controls (dilution ventilation). Pull VC &<br>benzene draeger tubes. Contact SH&E<br>if benzene or VC are present. |
|   |  | > 15-50 ppm (sustained in<br>BZ for more than 5<br>minutes) | Contact the SSO, implement mitigation<br>measures and prepare to upgrade PPE<br>to Level C (organic vapor cartridge)   |
|   |  | > 50 ppm  | Cease work, exit, and contact the Safety<br>Professional and PM.   |
| VOCs<br>(total by PID                   | Edge of Exclusion<br>Zones, every 30             | < 5 ppm   | Continue work in required PPE, monitor air, and implement engineering controls.  |
| with a 10.6 eV<br>bulb)                 | minutes during<br>drilling activities            | > 5 ppm (sustained in BZ<br>for more than 5 minutes)        | Continue mitigation measures and<br>contact the Safety Professional  |

#### 5.3 Calibration and Recordkeeping

Equipment used by AECOM will be calibrated in accordance with AECOM's standard operating procedures. A log of the calibrations and readings will be kept in the field notebook. Daily calibration information will also be recorded in the field notebook.

#### 6.0 PERSONAL PROTECTIVE EQUIPMENT

Personal protective equipment (PPE) will be worn during these activities to prevent on-site personnel from being injured by the safety hazards posed by the site and/or the activities being performed. In addition, chemical protective clothing will be worn to prevent direct dermal contact with the site's chemical contaminants. The following table describes the PPE and chemical protective clothing to be worn for general site activities and for certain specific tasks. AECOM employees must review and comply with SH&E 115 – Personal Protective Equipment.

#### 6.1 Personal Protective Equipment

| PPE Item                        | General      | Boring       | Sampling |
|---------------------------------|--------------|--------------|----------|
| Hard Hat                        |              | ~            |          |
| ANSI Class II Safety Vest       | $\checkmark$ | $\checkmark$ | ✓        |
| Steel Toed Safety Shoes         | ✓            | $\checkmark$ | ✓        |
| Safety Glasses with Sideshields | ✓            | $\checkmark$ | ✓        |
| Nitrile Gloves*                 |              | *√           | *√       |
| Leather Gloves                  |              | $\checkmark$ |          |
| Hearing Protection              |              | $\checkmark$ |          |
| Tyvek                           |              | *√           |          |
| Full Face Splash Shield         |              | *√           |          |

#### ✓ Required PPE

\*Note that Nitrile gloves and coveralls are only required for persons likely to come in direct contact with potentially contaminated soils and/or groundwater. Coveralls are required for extensive contact with contaminated soils and decontamination of drilling equipment.

#### 6.2 Other Safety Equipment

The following additional safety items will be available at the site:

- Portable, hand-held eyewash bottles
- First aid kit
- Type A-B-C fire extinguisher
- Portable phones

#### 7.0 SITE CONTROL

To prevent both exposure of unprotected personnel and migration of contamination due to tracking by personnel or equipment, hazardous work areas will be clearly identified and decontamination procedures will be required for personnel and equipment leaving those areas.

#### 7.1 Designation of Zones

AECOM designates work areas or zones as suggested in the "Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities," NIOSH/OSHA/USCG/EPA, November 1985. They recommend that the areas surrounding each of the work areas to be divided into three zones:

- Exclusion or "Hot" Zone
- Contamination Reduction Zone
- Support Zone

#### Figure 7-1 below illustrates typical work zone designations.

#### 7.1.1 Exclusion Zone

An exclusion zone will be established around the project site. If the work area is accessible to the public or other workers, the perimeter of the exclusion zone will be marked with caution tape or indicated by traffic cones so that employees, visitors, and client or host employer personnel are aware of the work being conducted.

All AECOM and contractor personnel entering these work areas must wear the prescribed level of protective equipment.

#### 7.1.2 Contamination Reduction Zone

A decontamination zone will be established adjacent to each work area. Personnel will remove contaminated gloves and other disposable items in this area and place them in a plastic bag until they can be properly disposed of.

#### 7.1.3 Support Zone

At this site the support zone will include the area outside of the exclusion zone.

#### 7.1.4 Site Access Control

The public will be restricted from the project site and monitoring well locations (during monitoring) by fences, barricade tape, traffic cones, and/or signs.

#### 7.1.5 Parking and Staging Areas

Parking will be restricted to areas that have been cleared of tall grass and combustible material. Vehicles parked on the public streets will be marked with cones both in front of and behind the vehicle.

#### 7.2 General Site Safety Practices

The following measures are designed to augment the specific health and safety guidelines provided in this plan.

- The "buddy system" will be used whenever possible by all field personnel. No one is to perform field work alone unless there is a written plan to work alone per the guidance of SH&E 306 Working Alone. Standby team members must be intimately familiar with the procedures for initiating an emergency response.
- Eating, drinking, chewing gum or tobacco, smoking or any practice that increases the probability of hand-to-mouth transfer and ingestion of materials is prohibited in the immediate work area and the decontamination zone.
- Smoking is prohibited in all work areas. Matches and lighters are not allowed in these areas.
- Hands and face must be thoroughly washed upon leaving the work area and before eating, drinking or any other activities.
- Beards or other facial hair that interfere with respirator fit are prohibited when the potential use of respirators is suspected.
- The use of alcohol or illicit drugs is prohibited during the conduct of field operations.
- All equipment must be decontaminated or properly discarded before leaving the site in accordance with the project work plan.
- Parking and pedestrian areas will be established and communicated to all workers.

#### 7.3 Hazard Control Methods

Methods employed to control exposure to hazards include the following:

#### 7.3.1 Engineering Controls

- Ventilation of the well head and/or vault for adequate enough amount of time to allow accumulated vapors to dissipate or migrate away from the workers breathing zone.
- The use of water spray to control dust emissions to control potential releases or contact with contaminated material.

#### 7.3.2 Administrative Controls

- Distance between worker and actual contaminated area, i.e., placing heavy equipment on clean side during certain activities to provide some measure of remoteness to the operation.
- Staying upwind from contaminant emissions.
- Ensuring only essential personnel are in work areas.

#### 7.3.3 Personal Protective Equipment (PPE)

• Use of respiratory and dermal protection as required.

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## Figure 7-1: Drilling Site Control Layout



#### 8.0 DECONTAMINATION

#### 8.1 Personal Decontamination

Proper decontamination is required of all personnel before leaving the site. Decontamination will occur within the contamination reduction zone.

Regardless of the type of decontamination system required, a container of potable water and liquid soap should be made available so employees can wash their hands and face before leaving the site for lunch or for the day.

#### 8.2 **PPE Decontamination**

Disposable PPE, such as Tyvek coveralls, gloves, etc. will be removed in the decon zone and placed in garbage bags. Final disposal of contaminated PPE will be in accordance with the work plan.

If worn, respirators will be cleaned after each use with respirator wipe pads and will be stored upright in plastic bags. Respirators will be thoroughly cleaned using disinfectant material within one week following any respirator use. Refer to the cleaning instructions provided with the respirator or specified by Appendix B-2 to the OSHA regulations at 29 CFR 1910.134.

#### 8.3 Equipment Decontamination

Equipment will be decontaminated prior to being moved to other locations. Decontamination procedures will be specified by the Project Manager.

#### 8.4 IDW Management

IDW includes spent PPE, spent groundwater, decontamination fluids, etc. IDW will be managed as impacted materials.

#### 9.0 EMERGENCY RESPONSE

OSHA defines emergency response as any "response effort by employees from outside the immediate release area or by other designated responders (e.g., mutual-aid groups, local fire departments, etc.) to an occurrence that results, or is likely to result in an uncontrolled release of a hazardous substance." According to AECOM policy, AECOM personnel shall not participate in any emergency response where there are potential safety or health hazards (e.g., fire, explosion, or chemical exposure). AECOM response actions will be limited to evacuation and medical/first aid as described within this section below. As such this section is written to comply with the requirements of 29 CFR 1910.38 (a).

The basic elements of an emergency evacuation plan include:

- employee training;
- alarm systems;
- escape routes;
- escape procedures;
- critical operations or equipment;
- rescue and medical duty assignments;
- designation of responsible parties;
- emergency reporting procedures; and
- methods to account for all employees after evacuation.

#### 9.1 Employee Training

Employees must be instructed in the site-specific aspects of emergency evacuation. On-site refresher or update training is required anytime escape routes or procedures are modified or personnel assignments are changed.

#### 9.2 Alarm System/Emergency Signals

An emergency communication system must be in effect at all sites. The simplest and most and effective emergency communication system in many situations will be direct verbal communications. Each site must be assessed at the time of initial site activity and periodically as the work progresses. Verbal communications must be supplemented anytime voices cannot be clearly perceived above ambient noise levels (e.g., noise from heavy equipment; drilling rigs, backhoes, etc.) and anytime a clear line-of-sight cannot be easily maintained amongst all AECOM personnel because of distance, terrain or other obstructions.

Verbal communications will be adequate to warn employees of hazards associated with the immediate work area. The property is occupied but AECOM may not have access to facility phones. Therefore, AECOM will bring a portable phone to the site to ensure that communications with local emergency responders is maintained, when necessary.

#### 9.3 Escape Routes and Procedures

The escape route from the site and an emergency muster point will be provided to all workers during the project mobilization. Prior to mobilizing to a new project area, the Site Safety Officer or his designee will confirm that the escape routes are clear and lead to a safe area.

#### **Emergency Muster Point**

| Emergency      | Evacuation Route | Muster Location |
|----------------|------------------|-----------------|
| Chemical Spill | TBD by SSO.      | TBD by SSO.     |
| Fire/Explosion | TBD by SSO.      | TBD by SSO.     |
| Tornado        | TBD by SSO.      | TBD by SSO.     |
| Lightning      | TBD by SSO.      | TBD by SSO.     |

#### 9.4 Employee Accounting Method

The SSO is responsible for identifying all AECOM personnel on-site at all times. AECOM and its subcontract employees will notify the SSO when they enter and leave the site. The SSO will account for all AECOM and its subcontract employees following an evacuation.

#### 9.5 Injuries and Illnesses

The phone numbers of the police and fire departments, ambulance service, local hospital, and AECOM representatives are provided in the emergency reference sheet on page 1. This sheet will be posted in the site vehicle.

# All injuries must be reported to direct supervisor/site supervisor and the Regional Health and Safety Manager.

All accidents and incidents that occur on-site during any field activity will be promptly reported to the SSO and the immediate supervisor in accordance with SH&E 201, *Incident Reporting*.

If any AECOM employee is injured and requires medical treatment, the Site Supervisor will contact the **Regional Safety Manager, AECOM's Incident Reporting Line at (800) 348-5046, and the applicable Account Manager immediately**. The Site Supervisor will initiate a written report, using the *Supervisor's Report of Incident* form (see SH&E 201). The Site Supervisor will complete the first two sections of this form and forward to the PM for completion of Section 3. The report will then be provided to the SH&E Professional before the end of the following shift.

If any employee of a subcontractor is injured, documentation of the incident will be accomplished in accordance with the subcontractor's procedures; however, copies of all documentation (which at a minimum must include the OSHA Form 301 or equivalent) must be provided to the SSO within 24 hours after the accident has occurred.

All accidents/incidents will be investigated in accordance with SH&E 204, *Incident Investigation*. Copies of all subcontractor accident investigations, whether accomplished in accordance with their own procedures or SH&E 204, will be provided to the SSO within five (5) days of the accident/incident.



#### First Aid

Minor injuries will be treated on site using materials from the first aid kit or other local sources. All cuts and abrasions will be cleaned with potable water and a clean dressing applied. The injured employee will be evaluated at the end of the work day and the following day when the employee arrives at the project site to determine whether the wound has started the healing process. The wound will be protected from contamination during the project activities.

#### 9.5.1 Professional Treatment

In the event an injury or illness requires more than first aid treatment, the SSO will accompany the injured person to the medical facility and will remain with the person until release or admittance is determined. The escort will relay all appropriate medical information to the on-site project manager and the RHSM.

If the injured employee can be moved from the accident area, he or she will be brought to the CRZ where their PPE will be removed. If the person is suffering from a back or neck injury the person will not be moved and the requirements for decontamination do not apply. The SSO must familiarize the responding emergency personnel about the nature of the site and the injury. If the responder feels that the PPE can be cut away from the injured person's body, this will be done on-site. If this not feasible, decontamination will be performed after the injured person has been stabilized.

#### 9.6 Designation of responsible parties

The SSO is responsible for initiating emergency response. In the event the SSO cannot fulfill this duty, the alternate SSO will take charge.

#### 9.7 Emergency Response Drills

For projects with durations of greater than four days on site, the SSO will initiate an evacuation drill during the first five days and shall repeat the drills at least quarterly. Deficiencies noted during the drills will be documented as a Near Loss, a Root Cause Analysis conducted and corrective actions initiated.

A table-top run through of the evacuations procedures from the manufacturing site will be conducted the first day on the site and reviewed with all workers arriving on site after that date.

Emergency Response drills and subsequent personnel briefings on evacuation procedures will be documented in the safety briefing agenda or briefing notes.

#### 9.8 Incident Reporting and Investigation

Any incident (other than minor first aid treatment) resulting in injury, illness or property damage requires an Incident investigation and report. The investigation should be conducted as soon as emergency conditions are under control. The purpose of the investigation is not to attribute blame but to determine the pertinent facts so that repeat or similar occurrences can be avoided. An AECOM Incident investigation form is presented in Attachment D of this HASP. The injured AECOM employee's supervisor, the AECOM Project Manager, and the RHSM should be notified immediately of the injury.

If a subcontractor employee is injured, they are required to notify the AECOM SSO. Once the incident is under control, the subcontractor will submit a copy of their company's Incident investigation report to the AECOM SSO.

# Attachment A – Health and Safety Plan Review Form

#### Personnel Acknowledgement

By signing below, the undersigned acknowledges that he/she has read and reviewed the AECOM Health and Safety Plan for the Cintas-Former RUS site in Winston-Salem, NC. The undersigned also acknowledges that he/she has been instructed in the contents of this document and understands the information pertaining to the specified work, and will comply with the provisions contained therein.

| PRINT NAME | SIGNATURE | ORGANIZATION | DATE     |
|------------|-----------|--------------|----------|
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Health and Safety Plan Cintas-Former RUS

# Attachment B – JSA & THA

Page \_\_ of \_\_

# Job Safety Analysis



| JSA Type: Investigation      | D&M  Office  Construction      | n 🗌 Other | Revised                    | Date:          |              |
|------------------------------|--------------------------------|-----------|----------------------------|----------------|--------------|
| Work Activity:               |                                |           | •                          | ŀ              |              |
| Personal Protective Equipmen | t (PPE):                       |           |                            |                |              |
|                              |                                |           |                            |                |              |
| Development Team             | Position/Title                 | Reviewe   | ed By                      | Position/Title | Date         |
|                              |                                |           |                            |                |              |
|                              |                                |           |                            |                |              |
|                              |                                |           |                            |                |              |
| Job Steps <sup>1</sup>       | Potential Hazards <sup>2</sup> | Cri       | tical Actions <sup>3</sup> | STOP Stop Wo   | ork Criteria |
|                              |                                | •         |                            | •              |              |
|                              |                                |           |                            |                |              |
|                              |                                | •         |                            | •              |              |
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|                              |                                | •         |                            | •              |              |
|                              |                                |           |                            |                |              |

1 – Target number of job steps: six to ten

#### 2 – Codes for Potential Hazards:

| Caught Between (CBT) | Contacted By (CB) | Caught On (CO) | Fall To Below (FB)     | Overexertion (O) | Struck Against (SA) |
|----------------------|-------------------|----------------|------------------------|------------------|---------------------|
| Caught In (CI)       | Contact With (CW) | Exposure (E)   | Fall - Same Level (FS) | Release To (R)   | Struck By (SB)      |

3 - Types of Critical Actions: Elimination, Engineering Controls, Safe Work Practice / SOP, Administrative Controls, and/or PPE.

4 - Stop Work Trigger: Condition or situation that would require work to be stopped and hazards re-assessed.

Health and Safety Plan Cintas-Former RUS

# Attachment C – Pre-Entry Briefing and Daily Tailgate Meeting Attendance Form

April 2011

# Health and Safety Pre-Entry Briefing Attendance Form

# Cintas-Former RUS Site, Winston-Salem, NC

| Conducted by:        |  | Date Performed: |  |  |
|----------------------|--|-----------------|--|--|
| Topics<br>Discussed: | 1. Review of the content of the HASP (Required)         2. |                 |  |  |
|                      | 3.   |                 |  |  |
|                      | 4.   |                 |  |  |

| Printed Name | Signature | Representing |
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Health and Safety Plan Cintas-Former RUS

# Attachment D – Applicable SH&E SOPs

|  |  |       | 101             |
|--|--|-------|-----------------|
| AECOM  |  | Rev:  | Original        |
| Stop Work Authority                              |  | Data: | October 5, 2009 |
| AECOM Safety, Health and Environmental Procedure |  | Dale. |                 |

## 1.0 PURPOSE

Establish the requirements for AECOM personnel to stop work if they believe there is an imminent Safety, Health, or Environmental risk as described below that will affect them, their co-workers, the public, or the environment.

### 2.0 SCOPE

This procedure applies to all AECOM U.S.-based employees and operations.

### 3.0 DEFINITIONS

**Discrepancy/Deficiency**: An omission or commission, a condition, or a situation that is in conflict with the procedures, standards, and the requirements of SH&E standards.

**Imminent Danger**: An impending or threatening situation, which, if left uncorrected, is likely to result in serious injury, property damage or environmental impairment.

**Potentially Dangerous**: Minor violations that present a low potential for serious injury, property damage or environmental impairment.

**Stop Work Order**: A directive to cease AECOM-controlled work issued for failure to follow procedures, imminent danger situations/conditions, accumulation of safety violations, etc. The Stop Work Order will apply to AECOM and its direct subcontractors placed at risk by the situations or conditions.

### 4.0 ROLES AND RESPONSIBILITIES

#### 4.1 EMPLOYEES

- Any time an employee identifies a discrepancy, deficiency, or potentially dangerous condition or act that is likely to cause an unsafe or unhealthy situation or an imminent danger situation, it is his/her responsibility to stop AECOM-directed work and bring it to the attention of the appropriate manager, Site Safety Officer, Project Manager, and/or Contractor representative.
- Any employee may report unsafe working conditions anonymously, but must provide sufficient detail and promptness to allow Management and the SH&E staff to initiate corrective action.

#### 4.2 SITE SAFETY OFFICER OR LOCAL SH&E REPRESENTATIVE

- Initiate the development and implementation of corrective actions to eliminate the condition causing the Stop Work Order for AECOM employees and other personnel under AECOM's direct control affected by such condition.
- Report the details of the Stop Work Order and any corrective actions implemented to the Project Manager and the appropriate Regional SH&E Manager.



#### 4.3 PROJECT MANAGERS (FIELD TASK MANAGERS, SUPERVISORS)

- Verify that corrective actions taken appropriately address the conditions leading to the Stop Work Order.
- If AECOM has control over the circumstance that has led to the condition, initiate additional corrective actions necessary to correct the conditions leading to the Stop Work Order. Otherwise, remain in communication with the persons or entities that are taking the corrective measures.
- Communicate such corrective actions and impacts on the project/office to the client and/or Region Management.
- Assure that documentation related to the Stop Work Order and corrective actions are placed in the project/office file.

# 4.4 REGIONAL BUSINESS LINE MANAGERS (INCLUDING REGIONAL, DISTRICT AND OFFICE MANAGERS)

- Provide support, in accordance with our contractual responsibilities for the project, to the implementation of corrective actions and communications with clients.
- Assure that there is no reprimand or reprisal associated with the initiation of a Stop Work Order.

#### 4.5 REGIONAL SH&E MANAGERS

- Provide technical guidance for the development and implementation of corrective actions.
- Communicate with the SH&E group and assist with the development of Shared Learning and Safety Alert notices.

#### 5.0 PROCEDURE

It is AECOM's policy and firm commitment that employees are expected to stop their work to prevent unacceptable exposure to workplace hazards, including unsafe conditions or worker behaviors, without fear of reprimand or reprisal. Cases involving reprisal, reprimand, or any attempt to discourage the initiation of Stop Work Orders and reporting of unsafe or unhealthy conditions or situations within AECOM should be immediately reported to the employee's Manager, Human Resources Representative, and Regional SH&E Manager.

#### 5.1 AUTHORITY

AECOM's stop-work authority applies to all work controlled by AECOM, its employees and AECOM-controlled subcontractor work activities. All AECOM personnel are authorized to stop work if there is an identified unsafe condition. If the responsible organization fails to provide resolution, or if at any time their acts or failure to act cause substantial harm or imminent danger to health and safety of project employees, the public or the environment, AECOM may issue an order stopping work in whole or in part. In the event that AECOM issues a Stop Work Order, an order issued by AECOM authorizing the resumption of work must be in place prior to restarting work.

In most cases, a Stop Work Order affects only those areas immediately involved in the hazardous situation. AECOM may issue a Stop Work Order for a portion of the work area(s) or an entire work area when unacceptable risks exist that cannot be mitigated by reasonable engineering controls, administrative actions or personal protective equipment. The Stop Work Order will remain in effect until the responsible organization resolves the problem(s) and brings the work area(s) to satisfactory conformance with established SH&E requirements. Work will not resume until appropriate corrective actions have been completed, ensuring that the condition has been rectified. The Stop Work Order will apply to AECOM and its direct subcontractors placed at risk by the situations or conditions.

#### 5.2 SEVERITY OF HAZARDS

#### 5.2.1 Imminent Danger Situations

- Upon becoming aware of an imminently dangerous situation that is not controlled by AECOM, the
  employee should immediately inform the persons or entities in control of such imminently dangerous
  activities upon their discovery of such activities, as well as his or her project manager of the situation. If
  the activities pertain to work that is controlled by AECOM, then the employee may stop the work upon
  discovering an imminently dangerous situation, and, thereafter, immediately notify his project manager,
  who may determine the appropriate further action to be taken (including the issuance of a formal Stop
  Work Order).
- "Stopping work" of AECOM-controlled work includes stabilizing an imminent danger situation to the extent that it can be left unattended for a prolonged period of time until the issue is resolved.
- The person requesting the work stoppage will notify the organization responsible for the work.
- The responsible organization will notify AECOM project/office management immediately of any "stop work" action(s) taken to rectify the situation.
- Failure to comply with any Stop Work Order by an AECOM employee in whole or in part may result in disciplinary action. Failure to comply with any Stop Work Order by an AECOM subcontractor employee may result in the immediate removal from the project and/or office location.

#### 5.2.2 Potentially Dangerous Situations

- Informal stop work interventions to correct minor conditions (e.g., to remind workers to put on their hard hats, safety glasses, etc.) do not require formal notification.
- If the minor condition cannot be corrected, a formal Stop Work Order will be issued and work will not be resumed until the situation has been eliminated.

#### 5.3 MANGEMENT - ISSUED STOP WORK ORDERS

Region, District, and Office Managers, Project Managers and/or SH&E Managers may issue a formal Stop Work Order for AECOM-controlled work in the following situations:

- Imminent danger exists involving the public or employee's safety and health or damage to the environment, facilities, or property.
- Continuing work or equipment usage will result in significant repair, rework, or removal.
- A project, or any segment of the project, is executed improperly or is out of compliance with applicable regulations or standards.

#### 5.4 RESUMING WORK

Work associated with the affected area or operation will not resume unless all corrective actions identified in the applicable Stop Work Order have been completed and closed.

In accordance with SH&E 307, *Project Safety Meetings*, all personnel affected by the Stop Work Order will be instructed on the corrective actions and preventative measures taken.

#### 5.5 RECORDS

The completed stop work order and any corrective action reports generated will be maintained at the project site for the duration of the project and placed in the closed project file.

#### 6.0 REFERENCE MATERIAL

SH&E 105 – Inspections, Audits, and Corrective Actions

SH&E 307 – Project Safety Meetings

Attachment 1 – Stop Work Order

# **8.0 REVISION HISTORY**

| Revision   | Date            | Change |
|------------|-----------------|--------|
| Original   | October 5, 2009 | N/A    |
| Revision 1 |                 |        |

#### This Form must be completed if any of the Following Criteria are met per SH&E 101 – Stop Work Order:

**1.** Imminent danger exists involving the public or employees' safety and health, the environment, facilities, or property.

2. Continuing work or equipment usage will result in significant repair, rework, or removal.

**3.** A project, or any segment of the project, is executed improperly or is out of compliance.

| Project Information                        |                          |                        |       |  |
|--|--------------------------|------------------------|-------|--|
| Project Name:                              |                          | Project No:            | Date: |  |
| Project Manager:                           |                          |                        | Time: |  |
| Reported By:                               |                          |                        |       |  |
| Stop Work Order is the result of the follo | wing:                    |                        |       |  |
| Inspection/Audit:                          | Environmental Impairment | Injury/Incident:       |       |  |
| Unsafe Condition(s)                        | Unsafe Behavior          | Improper Scope of Work |       |  |
| Other Safety Concern/Issue:                |                          |                        |       |  |
| Summary of Stop Work Order ( Describe      | )                        |                        |       |  |
|  |                          |                        |       |  |
|  |                          |                        |       |  |
|  |                          |                        |       |  |
|  |                          |                        |       |  |
|  |                          |                        |       |  |
|  |                          |                        |       |  |
|  |                          |                        |       |  |
|  |                          |                        |       |  |
|  |                          |                        |       |  |
|  |                          |                        |       |  |

#### **Return to Work**

The above Stop Work Order issues/concerns have been corrected and documented. By signing below, I certify that the above Stop Work Order scenario has been corrected and work is safe to resume.

| Title:  | Print Name: | Signature: |
|---|-------------|------------|
| Project Manager:                              |             |            |
| Party Issuing Stop Work Order:                |             |            |
| Sub-Contractor Supervisor:<br>(If Applicable) |             |            |

# \*\*\*All Stop Work Orders will be sent to the SH&E Regional Manager for review\*\*\*

| A  | AECOM | SH&E No.: | 103             |
|--|-------|-----------|-----------------|
|  |       | Rev:      | Original        |
| Safe Work Standards And Rules                    |       | Date:     | October 5, 2009 |
| AECOM Safety, Health and Environmental Procedure |       |           |                 |

## 1.0 PURPOSE

Demonstrates AECOM's commitment to the establishment and maintenance of workplaces free from recognized hazards.

### 2.0 SCOPE

This procedure applies to all AECOM U.S.-based employees and operations.

#### 3.0 DEFINITIONS

None

### 4.0 ROLES AND RESPONSIBILITIES

#### 4.1 DISTRICT AND OFFICE MANAGERS

**4.1.1** Responsible to support and apply all safe work standards and rules.

#### 4.2 PROJECT MANAGER (INCLUDING FIELD TASK MANAGERS, SUPERVISORS)

**4.2.1** Project Managers (PM) have overall responsibility for implementation and compliance with this procedure.

#### 4.3 REGIONAL SH&E MANAGERS

**4.3.1** Provide guidance as to safe work standards, rules, requirements and guidelines.

#### 4.4 EMPLOYEES

**4.4.1** Responsible for adhering to all AECOM safe work standards, rules, requirements and instructions.

#### 5.0 PROCEDURE

#### 5.1 SAFE WORK PRACTICES

- 1. Perform all job duties in a responsible manner, following and complying with regulatory standards, AECOM safety policies, industry standards, work practices, guidelines, and project-specific requirements governing the scope of work.
- 2. Be aware of the job site conditions, work environments, client operations, contractor activities, and general public (if applicable) that may impact an employee or be impacted by or affected by one's work.
- 3. Work in a manner that will not put oneself, other personnel or equipment or facilities at risk.
- 4. Identify hazardous conditions and activities in the work environment consistent with the job and training.
- 5. If one can not remove a hazard, it should be reported to the Project Manager promptly.
- 6. Implement established control methods consistent with project procedures and/or training.

- 7. Unsafe employee actions or behavior are prohibited.
- 8. Employees performing inspections, construction observations, investigations, reviews, surveys or visits to remote sites shall work in teams of a minimum of two persons present (buddy system), or an alternate communication plan must be provided (see SH&E SOP 306 *Working Alone*).
- 9. Work involving the removal, handling, storage or disposal of hazardous materials or wastes requires the approval of the appropriate SH&E Department representative. See SH&E SOP 701 *Hazardous Waste Operations and Emergency Response (HAZWOPER)*.
- 10. Immediately report all potentially dangerous conditions and injuries, regardless of severity, to the Field Task Manager.
- 11. Report all accidents that result in medical treatment, AECOM equipment damage or near miss incidents to supervision immediately. See SH&E SOP 201 *Incident Reporting*.

#### 5.2 PERSONAL STANDARDS

- 1. Any employee who willfully disregards AECOM or client safety standards, rules or requirements is subject to disciplinary action, including removal from the project and dismissal.
- 2. Carrying firearms or other weapons on AECOM or a client's property is prohibited, unless specifically required by the job assignment and authorized in accordance with SH&E SOP 619 *Weapons*.
- 3. Fighting and gambling are not permitted.
- 4. Be considerate of the safety and welfare of others. Distracting other's attention or engaging in practical jokes and horseplay is prohibited.
- 5. Employees are not permitted to use, sell or distribute, be under the influence, or have in their possession any controlled substances, drugs, or alcohol. The only exception is if an employee is taking prescription medication(s) under the direction of a physician. It is then the responsibility of the employee to notify one's Project Manager if the medication may impair their ability to perform their job function in a safe manner, in which case they shall be removed from that task.
- 6. Smoking is prohibited in any area specifically designated as "NO SMOKING" and in all AECOM facilities.
- 7. Be alert at all times. Obey safety signs, heed warning signs and instructions.
- 8. Report unsafe equipment, conditions, and actions or behavior to one's task leader or supervisor promptly.
- 9. Avoid back injuries by knowing one's capabilities, using proper lifting techniques, and seeking assistance when needed.
- 10. Employees should operate vehicles in a safe and conscientious manner (see SH&E SOP 107 *Driver and Vehicle Safety*).
- 11. Use only designated project entrances, parking areas and facilities.
- 12. Show or produce evidence of identification or required training if requested to gain entry to or while on a project.
- 13. Personal cameras, video recorders, and other photographic equipment shall not be used on site without the Project Manager and client's approval.
- 14. All employees shall direct any questions or concerns they may have about the project Health and Safety Plan (HASP), job tasks, instructions or conditions to the Project Manager or Regional SHE Manager.

#### 5.3 GENERAL SAFETY RULES

1. Employees are required to practice "good housekeeping" when performing job tasks at all AECOM locations and offices. Such practices include overseeing that work areas are kept clean and organized; using approved cleaning materials for tools and equipment; proper packaging and disposal of waste

materials including hazardous materials; and leaving a work area clean and orderly. This includes office work stations and occupancies.

- 2. One should plan work tasks before beginning work and consider any hazards that may exist and how to avoid them through proper work practices.
- 3. One should keep an eye out for and take care of one's "buddy" in the field.
- 4. Obey all warning signs (e.g., "Do Not Enter," "No Smoking," "Eye, Hearing or Respiratory Protection Required," "Permit Required Confined Space," "Authorized Personnel Only").
- 5. Do not jump from any elevated surface or platform, including truck beds, equipment and scaffolding.
- 6. Taking shortcuts leads to injury. Use appropriate ladders, platforms and stairs. Do not block, deface or remove any signage, barricade or fencing without approval.
- 7. Keep passageways clean and clear of debris, materials, hoses, cords, and tripping obstructions. Items should be moved to low activity areas or overhead.
- 8. Permits may be required when performing non-routine tasks and work involving hazards. Seek advice from the Project Manager.
- 9. Use only designated sanitary facilities.
- 10. Be alert to work going on, around or above you including contractor activities and motoring public vehicles.
- 11. Be familiar with project emergency procedures. Report all emergency situations to the Project Manager immediately.
- 12. Read scaffolding tags before using scaffolds. Never use a red-tagged scaffold. Climbing on an incomplete scaffold (normally yellow tag) requires use of and tying off of fall protection devices.
- 13. Hand tools, electronic devices and equipment may not be used for any purpose other than their intended use. Damaged equipment and tools with worn part(s) shall be reported to a supervisor or task leader for repair or replacement.
- 14. Electric power tools must be properly grounded or double insulated. Electric power tools shall be Ground Fault Circuit Interrupter-protected when use in wet and exterior conditions.
- 15. Defective tools and equipment, frayed and ungrounded electrical cords and unguarded tools and machinery shall not be used. Report same to the Project Manager.
- 16. Employees shall not remove floor covering, guard rails, or other working surfaces from any floor or perimeter side opening without approval by the Project Manager.
- 17. Defective or unsecured ladders shall not be used.
- 18. Employees shall not ascend or descend a ladder without free use of both hands while facing the ladder.

#### 5.4 SAFETY EQUIPMENT RULES

- 1. Always wear assigned safety equipment and Personal Protective Equipment (PPE).
- 2. Always use protective equipment in accordance with manufacturer's instructions and AECOM training and procedures.
- 3. All AECOM employees, subcontractors, subconsultants, visitors, and vendors shall wear a hard hat, high visibility vest, sturdy work boots and eye protection on construction projects. Other personal protective equipment may be required based on the nature of the work. (See SH&E SOP 115 *Personal Protective Equipment*).
- 4. Wear clothing suitable for the work being performed. Minimum attire consists of long pants and shirt with a minimum 4-inch sleeve, tank tops are not permitted unless otherwise specified in SH&E SOP 509 *Biological Hazards*.
- 5. Hearing protection devices shall be used when exposed to elevated noise levels.
#### SH&E 103: SAFE WORK STANDARDS AND RULES

- 6. Respirator use may be required in areas where dust, gas or fumes exist. Consult the Project Manager or the Regional SH&E Manager for guidance.
- 7. Fall protection equipment is required for all work with a fall exposure greater than six (6) feet on any elevated structure or aerial platform including structural steel, incomplete work platforms, scaffolding, open surface work and aerial lifts.
- 8. Modification or alteration of any safety equipment is prohibited as it changes the equipment's design strength and manufacturer's certifications.
- 9. PPE use shall be consistently enforced in accordance with rules established for the project and federal and state safety regulations.

#### 5.5 WORK ERGONOMIC RULES

- 1. Use proper methods to perform all job functions so as to minimize the risk of physical injury.
- 2. Take reasonable precautions when lifting heavy or large objects that could cause back injury or hernia. Do not exceed one's capability and strength. Seek assistance.
- 3. Make suitable adjustments to one's workstation including office furniture, chair, keyboard platform, computer monitor for comfort, equipment and work.
- 4. Avoid routine, repetitive motion hand activities. Integrate varying motions and body parts.
- 5. Change work routines e.g., phones, typing, files. Stretch and take mini-breaks.
- 6. See SH&E SOP 110 *Ergonomics*

#### 6.0 REFERENCE

- 6.1 SH&E SOP 107 Driver and Vehicle Safety
- 6.2 SH&E SOP 110 *Ergonomics*
- 6.3 SH&E SOP 115 Personal Protective Equipment.
- 6.4 SH&E SOP 201 Incident Reporting
- 6.5 SH&E SOP 306 Working Alone
- 6.6 SH&E SOP 509 *Biological Hazards*
- 6.7 SH&E SOP 619 Weapons
- 6.8 SH&E 701 Hazardous Waste Operations and Emergency Response (HAZWOPER)

#### 7.0 ATTACHMENTS

None

#### **8.0 REVISION HISTORY**

| Revision   | Date            | Change |
|------------|-----------------|--------|
| Original   | October 5, 2009 | N/A    |
| Revision 1 |                 |        |

| A  | AECOM | SH&E No.: | 104             |
|--|-------|-----------|-----------------|
|  |       | Rev:      | Original        |
| General Housekeeping                     |       | Data      | October 5, 2009 |
| Safety, Health & Environmental Procedure |       | Date.     |                 |

# 1.0 PURPOSE

Provides AECOM's work practices, personal hygiene, work site sanitation as to housekeeping requirements.

# 2.0 SCOPE

This procedure applies to all AECOM U.S.-based employees and operations.

## 3.0 DEFINITIONS

None

## 4.0 ROLES AND RESPONSIBILITIES

### 4.1 DISTRICT AND OFFICE MANAGERS (OPERATIONS)

In established office locations, lead managers including departmental and area managers and supervisors are responsible for this procedure's implementation.

### 4.2 PROJECT MANAGER (INCLUDING FIELD TASK MANAGER, SUPERVISOR)

On projects, Field Task Manager is responsible for the procedure's implementation.

Site Safety Coordinator is responsible to the Project Manager concerning the details of addressing housekeeping policy within the construction/demolition worksite.

#### 4.3 REGIONAL SH&E MANAGER

- SH&E Department personnel will monitor and report as to office and project housekeeping when visiting locations.
- **4.4 EMPLOYEES** are responsible to clean up their work areas.

### 5.0 PROCEDURE

#### 5.1 PERSONAL HYGIENE

#### 5.1.1 Smoking, Eating and Drinking

Eating and drinking will be permitted in authorized areas at AECOM project sites and offices and as specified on client sites. Smoking will be permitted only in areas designated by Field Supervision and situated in locations that are not in the immediate vicinity of activities associated with work site activities. Additionally, Field Supervision will designate each smoking area giving primary consideration to those personnel who do not smoke. Smoking is also permissible only outside AECOM offices.

#### SH&E 104: General Housekeeping

Personnel involved in the performance of certain activities will not be permitted to smoke, eat, drink, or use smokeless tobacco, except during breaks (e.g., HAZWOPER-controlled work areas).

Site personnel will first wash hands and face after completing work activities and prior to eating or drinking.

#### 5.1.2 Water Supply

Water supplies will be available for use on site and will comply with the following requirements:

#### Potable Water

An adequate supply of drinking water will be available for site personnel consumption. Potable water can be provided in the form of approved well or city water, bottled water, or drinking fountains. Where drinking fountains are not available, individual use cups will be provided as well as adequate disposal containers. Potable water containers will be properly identified in order to distinguish them from non-potable water sources.

#### Non-Potable Water

Non-potable water will not be used for drinking purposes.

Non-potable water may not be used for hand washing or other personal hygiene activities, but may be used for other types of cleaning activities. All containers/supplies of non-potable water used will be properly identified and labeled as such.

#### 5.1.3 Toilet Facilities

Toilet facilities will be available for site personnel and visitors. Should subcontractor personnel be located on-site for extended periods, it may become necessary to obtain temporary toilet facilities. Exceptions to this requirement will apply to mobile crews where work activities and locations permit transportation to nearby toilet facilities.

A minimum of one toilet will be provided for every 20 site personnel, with separate toilets maintained for each sex, except where there are less than five total personnel on site. For mobile crews where work activities and locations permit use of nearby toilet facilities (e.g., gas station, or rest stop), on site facilities are not required.

#### 5.1.4 Washing Facilities

#### Hand and Face

Site personnel will wash hands and face after completing work activities and prior to breaks, lunch, or completion of workday.

#### Personal Cleaning Supplies

Cleaning supplies at AECOM project sites will consist of soap, water, and disposable paper towels or items of equal use/application (e.g., anti-bacterial gels, wipes, etc.).

#### 5.1.5 Clothing and Personal Protective Equipment

All personal protective equipment will be kept clean at all times and maintained in accordance with the manufacturer's and AECOM requirements.

#### 5.2 SANITATION

#### 5.2.1 General Work Areas

At all times work areas will be kept free of dirt and debris that may impact the safety of site personnel and visitors. All trash receptacles will be regularly emptied.

#### 5.2.2 Break Areas and Lunchrooms

Site personnel will observe the following requirements when using break areas and lunchrooms at AECOM project sites:

- All food and drink items will be properly stored when not in use.
- Food items will not be stored in personal lockers for extended periods in order to prevent the potential for vermin infestation.

- Perishable foods will be refrigerated whenever possible.
- All waste food containers will be discarded in trash receptacles.
- All tables, chairs, counters, sinks, and similar surfaces will be kept clean and free of dirt, waste food, and food containers at all times.
- Refrigerators used to store food items will be maintained at 45 degrees Fahrenheit and emptied of all unclaimed food items weekly.
- Routine cleaning of refrigerators will also be performed on a regular basis.

#### 5.3 VERMIN CONTROL

Every enclosed workplace shall be constructed, equipped, and maintained, so far as reasonably practicable, to prevent the entrance or harborage of rodents, insects, and other vermin.

A continuing and effective extermination program shall be instituted where their presence is detected.

#### 5.4 OFFICE AREAS

Office areas are to be kept neat and orderly. The following general rules apply to prevent injuries and maintain a professional workplace appearance.

- All aisles, emergency exits, fire extinguishers, etc., will be kept clear (a minimum of three feet of either side) of material storage (temporary and permanent) at all times.
- Storage areas will be maintained orderly at all times. When supplies are received, the supplies will be stored properly.
- Cleaned-up spills immediately & dispose wastes properly.
- All waste receptacles will be lined with a plastic trash bag to avoid direct contact while handling. Employees will use rubber gloves and compaction bar when handling wastes.
- Keep file and desk drawers closed when not attended to avoid injuries. Open only one drawer at a time to prevent tipping of file cabinets.
- At the end of the business day to prevent fires and in accordance with AECOM's sustainability objectives, consideration by the Office Manager and individual employees should be made for turning off or at a minimum placing all office equipment in a low-energy consuming mode e.g., lighting, coffee makers, portable heaters, printers, copiers, plotting equipment, PCs, CAD and other equipment. All space heaters should be un-plugged at the end of the day to assure they have been turned-off.

#### 5.4.1 Property Grounds

The grounds surrounding the AECOM-leased facilities are an extension of the work place. The property manager is responsible for their maintenance and keeping them neat and orderly for employees and visitors to enjoy. The following general rules shall apply:

- All trash will be discarded only in the waste containers provided.
- Park only in the designated assigned area.
- The facility's maintenance department will be responsible for grounds keeping (mowing, trimming, etc.) as needed. Maintenance will also establish procedures for ice/snow removal, when necessary, prior to operations each day.

#### 5.5 GENERAL HOUSEKEEPING

• All work areas shall be kept clean to the extent that the nature of the work allows.

- Every work area shall be maintained, so far as practicable, in a dry condition. Where wet processes are used, drainage shall be maintained and platforms, mats, or other dry standing places shall be provided, where practicable, or appropriate waterproof footgear shall be provided.
- Protruding objects or placement of materials on paths or foot traffic areas present a problem with regard to slips, trips, falls, and puncture wounds. Personnel will use a reasonable amount of effort to keep slip, trip and fall hazards to a minimum.
- Excess debris and trash will be collected and stored in an appropriate container (e.g., plastic trash bags, garbage can, roll-off bin) prior to disposal.
- At no time will debris or trash be intermingled with waste PPE or contaminated materials.

### 5.6 ADDITIONAL REQUIREMENTS

The project PM or lead manager or Office Manager (or designees) will perform periodic, at a minimum semiannual, evaluations of cleanliness and sanitation conditions and document same using Attachment 1, Housekeeping Checklist.

Based on project-specific activities associated with the asset removal process, additional safety precautions may be required.

### 6.0 REFERENCE MATERIAL

None

## 7.0 ATTACHMENTS

Attachment 1 - Housekeeping Checklist

#### 8.0 REVISION HISTORY

| Revision   | Date            | Change |
|------------|-----------------|--------|
| Original   | October 5, 2009 | N/A    |
| Revision 1 |                 |        |

# Housekeeping, Hygiene & Sanitation Checklist

| Inspector<br>print): | Name | (please | Date: |  |
|----------------------|------|---------|-------|--|
| Inspector signature: |      | •       | _     |  |
| Company name:        |      |         |       |  |
| Area inspected:      |      |         |       |  |

Supervisor signature:

| ltem | 9.0 INSPECTION QUESTION  | Yes | No | NA | Correct<br>By: |
|------|--|-----|----|----|----------------|
| 1.   | Are there adequate toilet and washing facilities?                                    |     |    |    |                |
| 2.   | Is potable water provided for all employees?   |     |    |    |                |
| 3.   | Are non-potable water sources labeled?   |     |    |    |                |
| 4.   | Is smoking/eating/drinking permitted only in designated areas?                       |     |    |    |                |
| 5.   | Is designated PPE worn while handling impacted materials?                            |     |    |    |                |
| 6.   | Are decontamination washes and rinses changed out daily?                             |     |    |    |                |
| 7.   | Is trash/PPE placed into appropriate receptacles?                                    |     |    |    |                |
| 8.   | Are trash receptacles routinely emptied?   |     |    |    |                |
| 9.   | Is smoking prohibited in flammable storage areas?                                    |     |    |    |                |
| 10.  | Are proper receptacles available for storage of flammables?                          |     |    |    |                |
| 11.  | Are flammables and combustibles stored in non-smoking areas?                         |     |    |    |                |
| 12.  | Are oxygen and fuel gas cylinders stored upright and secured?                        |     |    |    |                |
| 13.  | Are oxygen and fuel gas cylinders stored a minimum of 20 feet apart?                 |     |    |    |                |
| 14.  | Are materials stacked and stored as to prevent sliding or collapsing?                |     |    |    |                |
| 15.  | Are materials and supplies stored outside of designated paths of travel?             |     |    |    |                |
| 16.  | Are areas of foot and vehicle traffic clear of debris?                               |     |    |    |                |
| 17.  | Are tripping hazards labeled or marked?  |     |    |    |                |
| 18.  | Are electrical / extension cords kept out of wet areas?                              |     |    |    |                |
| 19.  | Is trash picked up and placed into appropriate receptacles at the end of each shift? |     |    |    |                |
| 20.  | Are area personnel using designated paths of travel?                                 |     |    |    |                |

**AECOM** 



| 21.                  | Are aisles and walkways marked as appropriate?   |  |  |  |  |
|----------------------|--|--|--|--|--|
| 22.                  | Are holes in the floor, sidewalks, or other walking surface repaired properly, covered or otherwise made safe?   |  |  |  |  |
| 23.                  | Are aisles or walkways that pass near moving or operating<br>machinery, welding operations or similar operations<br>arranged so employees will not be subjected to potential<br>hazards? |  |  |  |  |
| 24.                  | Are work surfaces kept dry or are appropriate means taken to assure the surfaces are slip-resistant?   |  |  |  |  |
| 25.                  | Are all spilled hazardous materials or liquids, including<br>blood and other potentially infectious materials, cleaned up<br>immediately and according to proper procedures?             |  |  |  |  |
| Additional Comments: |  |  |  |  |  |

|  | AECOM                    | SH&E No.: | 112             |
|--|--------------------------|-----------|-----------------|
|  |                          | Rev:      | Original        |
| Er   | nergency Action Planning | Data      | October 5, 2000 |
| AECOM Safety, Health and Environmental Procedure |                          | Dale.     | October 5, 2009 |

# 1.0 PURPOSE

Addresses potential emergencies that may occur at a site including projects and offices. Each field project and office facility shall prepare for the possibility of an emergency.

# 2.0 SCOPE

This procedure applies to all AECOM U.S.-based employees and operations.

### 3.0 DEFINITIONS

#### 3.1 EMERGENCY

An unplanned situation or event (including natural disasters) resulting in involvement of the public emergency services, police, fire, paramedic, or the environmental regulatory authorities.

## 4.0 ROLES AND RESPONSIBILITIES

- Office and Project Managers are responsible for the development of a site-specific Emergency Action Plan.
- Office and Project Managers are responsible for the implementation of this procedure.
- Site Safety Coordinator is responsible to the Office or Project Manager concerning the execution of the procedure and development of the Emergency Action Plan.
- SH&E Department will review the activities of the Plan and provide guidance as appropriate.

# 5.0 PROCEDURE

The primary concern of AECOM is the preservation of life and the prevention of injury. In the event of an accident involving death or serious injury, significant damage to property, an explosion or fire, severe weather or natural disaster, or any other unpredicted interruption of business, foremost and most urgent AECOM employees and property must be protected in that order.

The following actions should be taken:

- Establishment and execution of an Emergency Action Plan.
- The communication of the Emergency Action Plan to all employees.
- Notification of the Regional SH&E Manager

# STAFF MEMBERS RESPONDING TO EMERGENCY SITUATIONS SHOULD TAKE NO UNNECESSARY RISK.

 All emergency procedures outlined in the AECOM SH&E Program and Procedures Manual are provided; however in situations where no specific procedures have been established, common sense and sound judgment should be followed to determine the safest course of action.

#### SH&E 112: Emergency Action Planning

- Upon evacuation or dismissal, no unauthorized or non-essential personnel are allowed access to the facility or project area during an emergency. All visitors must report to the office and be escorted to a safe place by a management representative.
- All accident and emergency sites must be immediately secured to prevent unauthorized access or the possibility of further risk to workers, property or the public at large.
- All emergencies will be handled by the highest ranking AECOM representative at the site or office. The office should clearly identify, if possible, who the highest ranking AECOM representative is from the person reporting the emergency.
- Project personnel are directed, as a condition of employment, not to discuss or give statements to anyone regarding emergencies. All communications and releases to the media shall be through the General Counsels Office and Communications Department.
- Employees are required to assist, as able to do so, and follow directions from a lead manager in any emergency operation.
- Emergency Action Plans shall be part of site SH&E audits.
- Employees should render assistance in the safest possible manner, using appropriate personal protective equipment and precautions.
- Prior to resuming operations, the work area will be inspected to assure that conditions are under control. In the case of a fire or bomb threat, this inspection is to be done by the ranking public emergency responder.
- In the event of an emergency, each job site and office lead manager or supervisor shall designate one area for all employees to gather for a roll call.
- During an emergency, AECOM staff shall take direction from outside professional responders who shall be in control of the situation and AECOM members of the emergency team, e.g., emergency coordinator, floor wardens.

## IT IS EXPECTED THAT MODIFICATIONS TO EMERGENCY PLANS WILL BE NECESSARY UPON ACTUAL SITE SET-UP AND CONDITIONS

#### 5.1 THE PATH OF TRAVEL FROM A WORKING AREA SHALL:

- Be made obvious and most direct with adequate illumination.
- Remain clear and unobstructed at all times.
- No material or equipment may be stored or temporarily left in path of egress.
- Have a traffic barrier used for facilitating vehicle and pedestrian traffic.
- Have clear line of vision into oncoming traffic lanes.

#### 5.2 PARKING

- Parking may be available within the various work zones throughout the incident.
- Signs will be posted to indicate permissible parking areas.
- Parking areas shall not restrict access by emergency personnel and vehicles.

### 6.0 REFERENCE MATERIAL

None

### 7.0 ATTACHMENTS

None

# **8.0 REVISION HISTORY**

| Revision   | Date            | Change |
|------------|-----------------|--------|
| Original   | October 5, 2009 | N/A    |
| Revision 1 |                 |        |

| A  | AECOM                                | SH&E No.: | 115             |
|--|--------------------------------------|-----------|-----------------|
|  |                                      | Rev:      | Original        |
| Pe   | ersonal Protective Equipment Program | Data:     | October 5, 2000 |
| AECOM Safety, Health and Environmental Procedure |                                      | Date.     | October 5, 2009 |

# 1.0 PURPOSE

Provide an effective Personal Protective Equipment (PPE) Program to protect AECOM employees from potential workplace safety and health hazards.

# 2.0 SCOPE

This procedure applies to all AECOM U.S.-based employees and operations.

## 3.0 DEFINITIONS

**PPE** – Personal Protective Equipment

ANSI – American National Standards Institute

## 4.0 ROLES AND RESPONSIBILITIES

#### 4.1 REGIONAL SH&E MANAGER

- Assist in the preparation and/or review of Health and Safety Plans (HASP) as required for projects.
- Provide guidance to Project Managers, Field Task Managers, Supervisors and field staff on the assessment of hazards and the selection of PPE.
- Provide training materials to Project Managers, Field Task Managers and Supervisors for employee training.

### 4.2 PROJECT MANAGERS (INCLUDING FIELD TASK MANAGERS, SUPERVISORS)

- Conduct Hazard Assessments to identify the hazards present and specify PPE appropriate for those hazards.
- Determine which of their staff members will require employee-issued personal protective equipment.
- Approve the purchase of company-issued personal protective equipment.
- Assure that appropriate personal protective equipment is utilized by their employees when required or necessary.

### 4.3 EMPLOYEE

- Utilize appropriate PPE which has been issued to them when required or necessary.
- Inspect their PPE prior to use to ensure that it is functional and maintain their PPE in a clean and functional condition.
- Follow instructions and manufacturers guidance as to care, use and storage of their PPE.

## 5.0 PROCEDURE

The proper use of appropriate PPE, in combination with effective engineering and administrative controls, can provide AECOM employees with adequate protection against potential workplace hazards and reduce the potential for workplace injury and illness. OSHA's PPE standard (29 CFR 1910.132) requires AECOM to:

- Assess workplace(s) to determine if hazards are present which necessitate the use of PPE; and, if such hazards are present:
  - Select the appropriate types of PPE; and,
  - $\circ$  Provide employees with training about the use and care of the selected PPE.

#### 5.1 HAZARD ASSESSMENT FOR OFFICE LOCATIONS

The checklist in Attachment 1 will be used to document the hazards associated with each job position. Some job positions involve several tasks that require the use of different types or combinations of PPE. If this is the case, each task will be assessed. The PPE recommendations for each task will be listed on the hazard assessment checklist.

The hazard assessment checklist will serve as the certificate of hazard assessment, as defined in 29 CFR 1910.132 (d) (2), for office activities that require PPE. This checklist will also be used to determine the PPE requirements for non-routine maintenance tasks that may not be evaluated during the initial hazard assessments.

#### 5.2 HAZARD ASSESSMENT FOR OFF-SITE LOCATIONS

#### 5.2.1 HAZWOPER Locations

Each health and safety plan (HASP) that is prepared for waste site investigations/remediation includes a hazard assessment for each proposed field activity. As required by 29 CFR 1910.120, task-specific PPE requirements are listed in the HASP. Therefore, the HASP will serve as the certificate of hazard assessment for each project that involves off-site work activities that require the use of PPE.

#### 5.2.2 All Other Off-Site Locations

The HASP will serve as the certificate of hazard assessment for projects that involves offsite work activities that require the use of PPE. The checklist will be reviewed with the entire field team prior to arriving at the site.

### 5.3 DETERMINING THE NEED FOR PPE

Using the hazard assessment checklist or HASP, the need for the following types of PPE will be evaluated:

#### 5.3.1 Eye and Face Protection

The OSHA standard requires that AECOM employees use appropriate eye and face protection when exposed to eye or face hazards from flying particles, molten metal, liquid chemicals, acid and caustic liquids, chemical gases or vapors and injurious light radiation. The standard further requires that eye protection provide side protection when there is a hazard from flying objects.

#### 5.3.2 Head Protection

Protective helmets (hard hats) are required when employees are working in areas where there is a potential for injury to the head from falling objects. When working near exposed electrical conductors that could contact the head, helmets designed to reduce electrical shock will be worn.

#### 5.3.3 Foot Protection

Protective footwear is required when employees are working in areas where there is a danger of foot injuries due to falling and rolling objects, or objects piercing the sole and where employee's feet are exposed to electrical hazards.

#### 5.3.4 Hand Protection

Appropriate hand protection is required when employee's hands are exposed to hazards such as those from skin absorption of harmful substances; severe cuts and lacerations; severe abrasions; punctures; chemical burns; thermal burns: and, harmful temperature extremes.

#### 5.3.5 Chemically-Resistant Clothing

Chemically-resistant clothing is required when there is a significant potential for the employee to come in direct contact with the chemicals he/she is handling. Tasks that involve chemical handling will be evaluated for the potential of splashing or spilling.

#### 5.3.6 High-Visibility Apparel

High visibility apparel with reflective banding (ANSI Class II and III garment) is required for all field activities in close proximity to moving traffic and other modes of transportation (transit, airlines, marine, etc.), in proximity to heavy equipment operations, or whenever otherwise specified in a project HASP. Color of apparel (orange or lime) may be client/project-specific.

#### 5.4 PPE SELECTION

After the hazard assessments have been completed, AECOM will select the appropriate PPE for each job category or task, as necessary. The selected equipment will be indicated on the hazard assessment checklist or in the HASP. Personal Protective Equipment will be provided to each employee appropriate for the hazards present. All PPE selected and purchased by AECOM, will meet or exceed the American National Standards Institute (ANSI) standards as indicated below.

#### 5.4.1 Eye Protection – ANSI Z87.1

AECOM will offer safety glasses with permanently attached sideshields or directly-vented goggles to all employees working in an area or at a process that involves flying particles. Non-vented and indirectly-vented goggles will be worn when employees are handling chemicals. Faceshields, in combination with glasses or goggles, will be required where a severe splash or impact hazard has been identified. When welding, employees must use equipment with filter lenses that have a shade number appropriate for protection against injurious light radiation.

#### 5.4.2 Foot Protection – ANSI Z41

Work shoes or boots shall have leather or rubber uppers, an oil-resistant sole, and a distinctive heel (defined as a raised section  $3/8" - \frac{1}{2}"$  across the entire heel). When required by the regulations or the client, AECOM will provide affected employees with safety-toed shoes/boots, which meet the requirements of ANSI Z41.1.

#### 5.4.3 Head Protection – ANSI Z89.1

On all construction projects and in the event that an overhead hazard exists, a four-point suspension Type II, Class A or B hard hat will be provided to affected employees.

#### 5.4.4 High-Visibility Safety Apparel – ANSI/ISEA 107-104

"High visibility safety apparel" means personal protective safety clothing that is intended to provide conspicuity during both daytime and nighttime usage, and that meets the Performance Class II of III requirements of the ANSI/ISEA 107-104 publication entitled, "American National Standard for High Visibility Safety Apparel and Headwear."

#### 5.4.5 Hand Protection - Performance Characteristics as Listed by the Manufacturer

Leather or Kevlar gloves should be used as appropriate to prevent cuts, lacerations, abrasions and punctures. Chemically-resistant gloves such as neoprene or nitrile rubber will be issued to employees who are likely to come in direct contact with chemicals. When selecting chemically-resistant gloves, AECOM will review the manufacturer's data tables regarding degradation of the glove material when exposed to the chemicals of concern, penetration of the chemicals of concern through imperfections in the gloves and permeation (breakthrough times) of the chemicals of concern through the glove material.

# 5.4.6 Chemically-Resistant Protective Clothing – Performance Characteristics as Listed by the Manufacturer

Whenever there is a potential for chemical splashing, disposable, chemically-resistant clothing, such as a coated-Tyvek coverall or apron, will be worn. Examples of when such clothing may be required include; 1) the cleaning of small spills, 2) non-routine tasks involving the use of chemicals; and, 3) the transfer of large quantities of chemicals from large containers to smaller ones. The process for selecting chemically-resistant clothing will be similar to that described for the selection of chemically-resistant gloves.

## 5.5 PPE SUPPLIES

Each AECOM office will maintain a supply of safety equipment including safety glasses, gloves, and chemicallyresistant clothing based on the nature of their field activities. The Office Manager or designee will be responsible for maintaining this inventory. PPE that is required for large field efforts will be ordered by the Project Manager or their designee.

## 5.6 EMPLOYEE TRAINING

All employees assigned to use PPE will be provided training appropriate to the PPE required. The following information, at a minimum, must be covered during PPE training:

- What PPE is required.
- When it is required.
- Why it is required.
- How to properly don, doff, adjust and wear the PPE described.
- The limitations of the PPE, including its expected useful life.
- How to properly care, maintain and dispose of the PPE.

AECOM employees who have participated in the 40-hour HAZWOPER training course are considered to have met the employee training requirements of the PPE standard.

The training certificates that are issued as documentation of successful completion of the 40-hour HAZWOPER course will also serve as documentation of training as required by the PPE standard.

Employees who have not participated in the HAZWOPER training will be provided PPE training specific to their assignment and/or location. The PPE Facts Sheets (attached) can serve as the basis for training.

# 5.7 OBTAINING PERSONALIZED SAFETY GEAR

The Occupational Safety and Health Administration (OSHA) standard in 29 CFR 1910 - Subpart I / 29 CFR 1926 requires that protective equipment including PPE for eyes, face, head, and extremities, protective clothing, and respiratory devices be provided to employees wherever it is necessary by reason of hazards.

Employees are not expected to provide their own general PPE. Although each AECOM office stocks and issues various general issue safety gear such as hard hats, plan safety glasses, disposable gloves and coveralls, fall protection, and hearing protection, certain personalized safety gear such as prescription safety glasses, safety-toed (capped) boots and cotton coveralls must be ordered and sized specifically for the user.

Most PPE will be provided to the employee at no charge, with the exception of the above personalized safety equipment (Rx safety glasses, safety toed boots, washable coveralls). There may be a partial cost reimbursement to the employee based on legacy company practice or project stipulations.

### 5.7.1 Prescription Safety Glasses

### Eligibility

Safety glasses must be worn by employees during activities which involve exposure to eye hazards such as flying particles, chemical splash or certain types of radiation such as ultraviolet light from welding operations. Typically, the following types of field activities will require the use of safety glasses:

- Site investigation or remediation and construction activities;
- Stack monitoring and other types of air emissions monitoring;
- Audits and assessments in industrial or manufacturing facilities;
- Activities conducted within laboratories; and,
- Activities at client facilities where safety glasses are required.

Eligibility to obtain prescription safety glasses will be determined by the employee's supervisor based upon the guidance above.

#### **Procurement of Prescription Safety Glasses**

Employees who have been authorized to purchase prescription safety glasses by their supervisor should consult the AECOM SH&E Department's Intranet Site for obtaining detailed instructions on how and where to purchase the equipment. Employees will be able to choose from several styles of approved frames, all equipped with permanently attached sideshields. Various lens materials are also available, although polycarbonate is recommended.

Except for eye examinations, associated prescription eyewear costs will be paid by AECOM. The employee may be asked to pay a dispensing fee to the optician, which may be submitted on an expense report for reimbursement. Since eye examinations are not covered, employees who have had recent eye examinations should contact the eye care professional in advance to determine their procedure for handling a current prescription.

Employees who are eligible will be allowed to order one pair of prescription safety glasses every other year from the selection of glasses offered by the program.

Contact the Regional SH&E Manager for guidance as to the procurement of prescription safety glasses.

#### 5.7.2 Safety Toed Boots/Shoes

#### **Eligibility**

Safety boots/shoes must be worn by employees during activities which pose the potential for foot injury from dropped objects or penetrations through the sole. Typically, safety toed boots/shoes will be required for the same type of activities, with the exception of laboratory activities, for which safety glasses are required. In addition, work around all types of heavy equipment will typically require the use of safety shoes.

Eligibility to obtain safety shoes will be determined by the employee's supervisor based upon the guidance above.

#### Procurement of Safety Shoes

Employees who have been authorized to purchase safety shoes by their supervisor should consult the Regional SH&E Manager for obtaining for detailed instructions on how and where to purchase the equipment. The style chosen (i.e., boot or shoe) should be determined based upon the application. For example, low cut shoes may be appropriate for audits and assessments in light industry applications while safety boots will be more appropriate for environmental remediation, construction and heavy industry work with significant foot hazards. Before purchasing, the employee is required to verify that the safety boots or shoes meet the specifications above.

With pre-approval after the purchase, an employee expense report, including a dated receipt for the shoes, should be presented to the employee's supervisor for approval and submission. The employee will be reimbursed by AECOM up to a deductible that is specified by the SH&E Department or Regional Operations management.

Employees who are eligible will be allowed to purchase one pair of safety shoes every other year. Employees should contact their Regional SH&E Manager for guidance about procurement of safety footwear.



#### 5.7.3 Reusable Coveralls

#### **Eligibility**

Reusable cotton (or some other washable fabric) coveralls may be made available to employees who regularly perform field work based on conditions. Coveralls can be worn over personal clothing to help protect and keep them clean.

Eligibility to obtain washable coveralls will be determined by the employee's supervisor based upon the guidance above.

#### Procurement of Reusable Coveralls

AECOM has established a master services agreement with a work clothing vendor which supplies us with longsleeved, blue coveralls bearing the AECOM logo. These coveralls can be ordered through a standard purchase requisition authorized by the employee's supervisor. The cost of the coveralls will be covered entirely by your region.

Employees who are eligible will be allowed one pair of coveralls per year.

### 6.0 REFERENCE MATERIAL

Title 29, Code of Federal Regulations, Part 1910, Subpart 1 Title 29, Code of Federal Regulations, Part 1910.120 Title 29, Code of Federal Regulations, Part 1926 SH&E SOP 113 – *Hearing Conservation Program* SH&E SOP 114 - *Respiratory Protection Program* SH&E SOP 605 - *Fall Protection* 

### 7.0 ATTACHMENTS

Attachment 1 - Personal Protective Equipment Hazard Analysis

Attachment 2 - PPE Fact Sheet – Eye Protection

Attachment 3 - PPE Fact Sheet – Head Protection

Attachment 4 - PPE Fact Sheet – Foot Protection

Attachment 5 - PPE Fact Sheet – Hand Protection

Attachment 6 - PPE Fact Sheet – Chemical Protective Clothing

### **8.0 REVISION HISTORY**

| Revision   | Date            | Change |
|------------|-----------------|--------|
| Original   | October 5, 2009 | N/A    |
| Revision 1 |                 |        |

# PERSONAL PROTECTIVE EQUIPMENT HAZARD ANALYSIS

- 1. Job Title(s): This hazard analysis describes the tasks and required personal protective equipment for the following job titles:
- 2. Description of Tasks: The tasks performed by personal in the above job titles include:

## 3. Potential Hazards and PPE Selection. (See List of Potential Hazards for assistance)

| TASK | POTENTIAL HAZARDS (1) | PPE SELECTION |
|------|-----------------------|---------------|
|      |                       |               |
|      |                       |               |
|      |                       |               |
|      |                       |               |
|      |                       |               |
|      |                       |               |
|      |                       |               |
|      |                       |               |
|      |                       |               |
|      |                       |               |

(1) Refer to attached list for a list of potential hazards to consider.

Signature of certifying Manager that tasks are accurately described.

Print Name:

Signature

Date

EARTH TECH

AECOM

10/5/2009

# LISTS OF POTENTIAL HAZARDS

|       | POTENTIAL HAZARDS                        |
|-------|--|
| HEAD  | Falling overhead objects                 |
|       | Spark contact                            |
|       | Chemical contamination                   |
|       | Cold/heat                                |
|       | Electrical (>600 volts)                  |
|       |  |
| HANDS | Cut, puncture, abrasions                 |
|       | Burns                                    |
|       | Dermatitis                               |
|       | Chemical absorption                      |
|       | Cold                                     |
|       |  |
| FEET  | Falling or rolling objects               |
|       | Chemical absorption                      |
|       | Dermatitis                               |
|       | Burns                                    |
|       | Cold                                     |
|       | Slips, trips                             |
|       |  |
| FACE  | Burns (chemical, spark, UV radiation)    |
|       | Chemical splashing                       |
|       | Flying particulates                      |
|       | Abrasions, cuts                          |
|       |  |
| EYES  | Burns (gas, liquid, spark)               |
|       | Abrasions-flying particulates            |
|       | Absorption                               |
|       | Retinal/corneal damage (UV/IR radiation) |
|       |  |
| EARS  | Noise                                    |
|       | Cold                                     |

| BODY PROTECTION | Chemical splashing                                   |
|-----------------|--|
|                 | Burns (chemical, UV radiation)                       |
|                 | Absorption   |
|                 | Spark contact  |
|                 | Cuts/abrasions/punctures                             |
|                 | Heat/cold stress                                     |
|                 | Moving vehicles/heavy equipment                      |
|                 |  |
| MISCELLANEOUS   | Insects (ticks, spiders, mosquitoes, bees/wasps)     |
|                 | Animals (dogs, bears, wild boars, raccoons)          |
|                 | Reptiles (snakes)                                    |
|                 | Poison plants (poison ivy, poison sumac, poison oak) |
|                 | Biological (fungus, bacteria, fungus, viral)         |

EARTH TECH AECOM

|                            |   |  | PROTECTOR   |   |  | NOT RECOMMENDED  |
|----------------------------|---|--|---|---|--|--|
|                            |   | ASSESSMENT   | TYPE (see Table 2)                                      | PROTECTOR   | LIMITATIONS  |  |
| I<br>M<br>P<br>A<br>C<br>T | Chipping,<br>grinding,<br>machining,<br>masonry work,<br>riveting, and<br>sanding.            | Flying fragments,<br>objects, large chips,<br>particles, sand, dirt,<br>etc. | B, C, D,<br>E, F, G,<br>H, I, J,<br>K, L, N             | Spectacles,<br>goggles,<br>faceshields<br>SEE NOTES (1)<br>(3)<br>(5) (6) (10)<br>For severe<br>exposure<br>Add N   | Protective devices<br>do not provide<br>unlimited<br>protection.<br>SEE NOTE (7)   | Protectors that do not<br>provide protection from<br>side exposure.<br>SEE NOTE (10)<br>Filter or tinted lenses<br>that restrict light<br>transmittance, unless it<br>is determined that a<br>glare hazard exists.<br>Refer to OPTICAL<br>RADIATION. |
| HEAT                       | Furnace<br>operation,<br>pouring,<br>casting, hot<br>dipping, gas<br>cutting, and<br>welding. | Hot sparks<br>Splash from molten<br>metals<br>High temperature<br>exposure   | B, C, D,<br>E, F, G,<br>H, I, J,<br>K, L, *N<br>*N<br>N | Faceshields,<br>goggles,<br>spectacles.<br>*For severe<br>exposure, add N<br>SEE NOTE (2)<br>(3)<br>*Faceshields<br>worn over<br>goggles H, K<br>SEE NOTE (2)<br>(3)<br>Screen<br>faceshields.<br>Reflective<br>faceshields.<br>SEE NOTE (2)<br>(3) | Spectacles, cup<br>and cover type<br>goggles do not<br>provide unlimited<br>facial protection.<br>SEE NOTE (2)   | Protectors that do not<br>provide protection from<br>side exposure.  |
| C<br>H<br>E<br>M           | Acid and<br>chemicals<br>handling,<br>degreasing,<br>plating                                  | Splash   | G, H, K<br>*N   | Goggle, eyecup<br>and cover types.<br>*For severe<br>exposure, add N  | Ventilation should<br>be adequate but<br>well protected<br>from splash entry   | Spectacles, welding<br>helmets, handshields  |
| I<br>C<br>A<br>L           |   | Irritating mists   | G   | Special purpose<br>goggles  | SEE NOTE (3)   |  |
| D<br>U<br>S<br>T           | Woodworking,<br>buffing, general<br>dusty<br>conditions.                                      | Nuisance dust  | G, H, K   | Goggles, eyecup<br>and cover types  | Atmospheric<br>conditions and the<br>restricted<br>ventilation of the<br>protector can<br>cause lenses to<br>fog. Frequent<br>cleaning may be<br>required. |  |

# TABLE 1 – EYE & FACE PROTECTION SELECTION CHART

|                            |   |            | PROTECTOR                    |  |   | NOT RECOMMENDED  |
|----------------------------|---|------------|------------------------------|--|---|--|
|                            | 1   | ASSESSMENT | TYPE                         | PROTECTOR  | LIMITATIONS   |  |
| O<br>P<br>T<br>I           |   |            |                              | TECTORS<br>FILTER<br>LENS PRO-<br><u>SHADE</u><br>TECTORS                        |   |  |
| C<br>A<br>L<br>R<br>A<br>D | WELDING:<br>Electric Arc                    |            | O, P, Q                      | SEE NOTE (9)<br>10-14 Welding<br>Helmets or<br>Welding Shields                   | Protection from<br>optical radiation is<br>directly related to<br>filter lens density.<br>SEE NOTE (4).<br>Select the darkest<br>shade that allows<br>adequate task<br>performance. | Protectors that do<br>not provide<br>protection from<br>optical radiation.<br>SEE NOTE (4) |
| I<br>A<br>T<br>I<br>O<br>N | WELDING:<br>Gas<br>CUTTING<br>TORCH BRAZING | 3          | J, K, L,<br>M, N, O,<br>P, Q | SEE NOTE (9)<br>4-8 Welding<br>Goggles or<br>Welding<br>Faceshield<br>3-6<br>3-4 | SEE NOTE (3)  |  |
|                            | TORCH SOLDER                                | ING        | B, C, D,<br>E, F, N          | 1.5-3 Spectacles or<br>Welding Faceshield  |   |  |
|                            | GLARE                                       |            | А, В                         | Spectacle<br>SEE NOTE (9)<br>(10)  | Shaded or<br>Special<br>Purpose<br>lenses, as<br>suitable.<br>SEE NOTE (8)  |  |

#### TABLE 1 – EYE & FACE PROTECTION SELECTION CHART (cont.)

#### NOTES

- (1) Care shall be taken to recognize the possibility of multiple and simultaneous exposure to a variety of hazards. Adequate protection against the highest level of each of the hazards must be provided.
- (2) Operations involving heat may also involve optical radiation. Protection from both hazards shall be provided.
- (3) Faceshields shall only be worn over primary eye protection.
- (4) Filter lenses shall meet the requirements for shade designations in Table 9-2.
- (5) Persons whose vision requires the use of prescription (Rx) lenses shall wear either protective devices fitted with prescription (Rx) lenses or protective devices designated to be worn over regular prescription (Rx) eyewear.
- (6) Wearers of contact lenses shall also be required to wear appropriate covering eye and face protection devices in a hazardous environment. It should be recognized that dusty and/or chemical environments may represent an additional hazard to contact lens wearers.
- (7) Caution should be exercised in the use of metal frame protection devices in electrical hazard areas.
- (8) Refer to Section 6.5, Special Purpose Lenses. (ANSI A87.1-1989)
- (9) Welding helmets or handshields shall be used only over primary eye protection.
- (10) Non-sideshield spectacles are available for frontal protection only.

# **TABLE 2 - EYE AND FACE PROTECTOR SELECTION GUIDE**

- A. SPECTACLE, No sideshield
- B. CUP GOGGLE, Direct ventilation
- C. CUP GOGGLE, Indirect ventilation
- D. SPECTACLE, Headband temple
- E. COVER WELDING-BURNING GOGGLES, Indirect Ventilation
- F. FACESHIELD
- G. WELDING HELMET, Hand held
- H. WELDING HELMET, Stationary window

- I. WELDING HELMET, Lift front
- J. COVER GOGGLE, Direct ventilation
- K. SPECTACLE, Half sideshield
- L. SPECTACLE, Full sideshield
- M. SPECTACLE, Detachable sideshield
- N. SPECTACLE, Non-removable lens
- O. SPECTACLE, Lift front
- P. COVER GOGGLE, No ventilation
- Q. COVER GOGGLE, Indirect ventilation

# TABLE 3. FILTER LENSES FOR PROTECTION AGAINST RADIANT ENERGY

| OPERATIONS                    | ELECTRODE<br>SIZE | ARC CURRENT   | MINIMUM PROTECTIVE<br>SHADE |
|-------------------------------|-------------------|---------------|-----------------------------|
|                               | 1/32 INCH         |               |                             |
|                               |                   |               |                             |
| Shielded metal-arc            | Less than 3       | Less than 60  | 7                           |
| welding                       | More than 3-5     | 60-160        | 8                           |
|                               | More than 5-8     | 161-250       | 10                          |
|                               | More than 8       | 251-550       | 11                          |
| Gas metal arc welding         |                   | Less than 60  | 7                           |
| and flux cored arc<br>welding |                   | 60-160        | 10                          |
| Weitenig                      |                   | 161-250       | 10                          |
|                               |                   | 251-500       | 10                          |
| Gas tungsten arc welding      |                   | Less than 50  | 8                           |
|                               |                   | 50-150        | 8                           |
|                               |                   | 151-500       | 10                          |
| Air carbon                    | (Light)           | Less than 500 | 10                          |
| Air cutting                   | (Heavy)           | 500-1000      | 11                          |
| Plasma arc welding            |                   | Less than 20  | 6                           |
|                               |                   | 20-100        | 8                           |
|                               |                   | 101-400       | 10                          |
|                               |                   | 401-800       | 11                          |
| Torch brazing                 |                   |               | 3                           |
| Torch soldering               |                   |               | 2                           |
| Carbon arc welding            |                   |               | 14                          |
| 8.1.1.1 OPERATIONS            | PLATE             |               | 8.1.1.2 MINIMUM*            |
|                               | (INCHES)          | (MM)          | PROTECTIVE SHADE            |
|                               |                   |               |                             |
| Gas welding:                  |                   |               |                             |
| Light                         | Under 1/8         | Under 3.2     | 4                           |
| Medium                        | 1/8 to ½          | 3.2 to 12.7   | 5                           |
| Heavy                         | Over 1/2          | Over 12.7     | 6                           |
| Oxygen cutting:               |                   |               |                             |
| Light                         | Under 1           | Under 25      | 3                           |
| Medium                        | 1 to 6            | 25 to 150     | 4                           |
| Heavy                         | Over 6            | Over 151      | 5                           |

# CERTIFICATE OF EMPLOYEE TRAINING

| I, the undersigned employee, have received copies of the PPE Fact Sheets as indicated above. I understand the content of those sheets and the requirements for the use of PPE as specified in this assessment. I have also discussed this information with the Health and Safety Manager. |  |  |                           |     |  |  |
|---|--|--|---------------------------|-----|--|--|
| Eye & Face     Head     Foot Protection     Hand     Chemical       Protection     Protection     Protection     Protection   |  |  |                           |     |  |  |
| Employee  |  |  | Health and Safety Manager |     |  |  |
| Signature   |  |  | Signati                   | ure |  |  |

# **PPE Fact Sheet – Eye and Face Protection**

Personal protective equipment (PPE) is designed to protect you from health and safety hazards that cannot be removed from your work environment. Personal protective equipment is designed to protect many parts of your body including eyes, face, head, hands and feet. AECOM has evaluated each of the job tasks performed in AECOM offices. The purpose of these evaluations was to assess the hazards associated with a specific task and to determine what type or types of PPE will adequately protect you from those hazards. It has been determined that your job will require the use of eye and/or face protection. This fact sheet has been developed to inform you about why eye and face protection is needed, when it should be worn, how to wear and adjust it properly, the limits of this type of PPE and how to properly maintain and clean the eye and face protection you are issued.

### TYPES OF EYE AND FACE PROTECTION

There are three major types of eye and face protection, including:

#### **Primary Protectors**

#### Safety glasses

The most widely used form of eye protection is safety glasses. To prevent lateral exposure to impact fragments, safety glasses are often equipped with side shields. Depending on the hazard, side shields can be either a cup-type or flat-folded. The cup-type provides more complete protection.

#### Safety goggles

- Vented goggles impact only
- Indirectly vented chemical splash and impact
- Non-vented chemical fumes

Glasses offer excellent protection against impact; however, goggles form a tight-fitting seal to the skin around the entire eye and are more appropriate for chemical concerns.

#### Secondary Protectors

#### Faceshield

Wear faceshields when there is a severe danger from impact or chemical splash. Faceshields are secondary protectors and must be worn over safety glasses or goggles.

#### Welding Helmet or Faceshield

When welding, employees must use equipment with filter lenses that have a shade number appropriate for protection against injurious light radiation.

#### CLEANING AND MAINTAINING SAFETY EYEWEAR

- Clean lenses and frames regularly with soap and water. Store in a clean, dry area.
- Replace scratched, pitted, cracked or broken safety eyewear immediately.

#### **PROPER FIT/ADJUSTING GLASSES**

PPE that fits poorly will not afford the necessary protection. When fitting devices for eye protection against dust and chemical splashes, be sure that the devices are sealed to the face. If the temple bars of the glasses are too long, the glasses will have a tendency to fall forward and slide down your nose. Check with your health and safety coordinator if you need glasses with adjustable temple bars. Standard safety glasses are 58 mm in size; however, smaller sizes (54 mm) are also available.

### WHEN TO WEAR PROTECTION

| Hazard             | Concern                              | Glasses                         | Goggles  | Faceshield   |
|--------------------|--------------------------------------|---------------------------------|--|--|
| Impact             | Flying fragments<br>from front/sides | Safety glasses with sideshields | Vented goggles                                     | Severe danger from<br>impact. Wear with<br>glasses/goggles |
| Chemicals          | Splash                               |                                 | Indirectly vented                                  | Severe splash. Wear with goggles.                          |
| Chemicals          | Fumes                                |                                 | Non-vented   |  |
| Injurious<br>Light |                                      |                                 | Welding goggles<br>with appropriate<br>shaded lens | Welding helmet with<br>appropriate shaded<br>lens          |
| Dust               | Dust entering the eye                | Safety glasses with sideshields | Vented goggles                                     |  |

### PRESCRIPTION GLASSES/CONTACT LENSES

AECOM has selected several types of safety glasses and goggles which meet the standards specified in the OSHA PPE Standard. Prescription eyeglasses must not be substituted for safety eyeglasses. Regular eyeglasses do not offer the same impact resistance of the lens and frame assembly as safety glasses and are not ANSI-approved. Goggles can be worn over eyeglasses. If you wear corrective lenses, contact your health and safety coordinator for information about how to obtain prescription safety glasses.

Contact lenses are not recommended for any industrial job. Dust caught underneath the lens can cause painful abrasions. Some chemicals can react with your contacts to cause permanent injury.

# **PPE Fact Sheet – Head Protection**

Personal protective equipment (PPE) is designed to protect you from health and safety hazards that cannot be removed from your work environment. Personal protective equipment is designed to protect many parts of your body including eyes, face, head, hands and feet. AECOM has evaluated each of the job tasks that are performed in the office. The purpose of these evaluations was to assess the hazards associated with a specific task and to determine what type or types of PPE will adequately protect you from those hazards.

Since there is no potential for injury to the head from falling objects, head protection is not required. However, there may be some non-routine maintenance tasks or construction activities that may require such equipment. The need for this type of PPE while performing such non-routine tasks will be evaluated by your health and safety coordinator.

#### TYPES OF HEAD PROTECTION

The main type of head protector is the helmet. Helmets are designed to protect you from impact and penetration caused by objects hitting your head, and from limited electrical shock or burns. The shell of the helmet is designed to absorb some of the impact. The suspension, which consists of a headband and strapping, not only holds the helmet in place, but is critical for absorbing and distributing impact shock loads.

Type I helmets offer the greatest protection from falling objects. They have a continuous brim surrounding the entire shell. The Type II cap is commonly referred to as a hard hat. The Type II helmet provides the same protection for the crown of the head but lacks the brim to protect the shoulders and the neck.

**Class A** helmets are made from insulating material to protect you from falling objects and electric shock by voltages up to 2,200 volts. **Class B** helmets are made from insulating material to protect you from falling objects and electric shock by voltages of up to 20,000 volts. **Class C** helmets are designed to protect you from falling objects but are not designed for use around live wires or where corrosive substances are present. AECOM typically issues a Class C, Type 1 hardhat.

#### PROPER FIT/MAINTENANCE

The suspension of the hard hat must be adjusted to fit the wearer and to keep the shell a minimum distance of one- and one-fourth inches above the wearer's head. Periodically inspect the suspension of your hard hat. Look for loose or torn cradle straps, loose rivets, broken sewing lines or other defects. Replace the hat after a major impact.

# **PPE Fact Sheet – Foot Protection**

Nearly two million people are expected to receive disabling work-related injuries this year. More than one-fourth of these injuries will involve the head, eyes, hands or feet. Personal protective equipment (PPE) is designed to protect you from health and safety hazards that cannot be removed from your work environment. Personal protective equipment is designed to protect many parts of your body including eyes, face, head, hands and feet.

AECOM has evaluated each of the job tasks that are performed in the offices. The purpose of these evaluations was to assess the hazards associated with a specific task and to determine what type or types of PPE will adequately protect you from those hazards. It has been determined that your job will require the use of foot protection.

Foot injuries are most likely to occur:

- When heavy or sharp objects fall on your foot;
- When something rolls over your foot; or
- When you step on an object that pierces the sole of your shoe.

#### **TYPES OF FOOT PROTECTION**

Safety shoes and boots must meet the requirements of ANSI Z41.1. Safety shoes and boots are made with a steel-reinforced box toe to protect your foot from being pierced or crushed by a falling object. Safety shoes or boots with flexible steel insoles provide puncture resistance. They will stop or deflect nails or other objects that have penetrated the sole of the shoe. Oil resistant soles provide the added safety feature of preventing slips and trips on slippery work floors.

#### LIMITATIONS OF FOOT PROTECTION

Wearing safety shoes will adequately protect your feet from most impact hazards. However if the load on the toebox becomes too great (75 foot-pounds or greater), the toe box will be crushed.

#### **PROPER FIT**

Like most PPE, the more comfortable it is to use, the more likely you will be to use it. The fit of the safety shoe is of the utmost importance. Safety shoes must be tried on by the employee before purchasing them. When selecting shoes, be sure that they are ANSI-approved. Consult with your health and safety coordinator about how to obtain safety shoes.

# **PPE Fact Sheet - Hand Protection**

Personal protective equipment (PPE) is designed to protect you from health and safety hazards that cannot be removed from your work environment. PPE is designed to protect many parts of your body including eyes, face, head, hands and feet. AECOM has evaluated each of the job tasks that are performed in the office. The purpose of these evaluations was to assess the hazards associated with a specific task and to determine what type(s) of PPE will adequately protect you from those hazards. It has been determined that your job will require the use of hand protection. This fact sheet will inform you about why and when hand protection is needed, the limits of the gloves and how to properly clean and dispose of the gloves.

#### **TYPES OF HAND PROTECTION**

Hand protection is required when there is a potential for:

- Skin absorption of harmful substances;
- Severe cuts or lacerations, abrasions or punctures;
- Vibration; and,
- Temperature extremes.

Gloves are the most common protectors for the hands. Unfortunately, there is not one type of glove that provides adequate protection against all potential hand hazards. Leather gloves provide good protection from cuts and lacerations but offer no protection against chemicals. Nitrile or neoprene rubber gloves offers good resistance to chemicals but they tear and rip easily when sharp objects are handled. The chemically-resistant gloves used by AECOM were selected based on the manufacturer's chemical compatibility data which indicates how each glove material performed in breakthrough time tests against certain chemicals. Do not substitute another type of glove for the chemically-resistant gloves that have been selected. They may not offer adequate protection for the chemicals you handle.

#### PROPER FIT/CLEANING/DISPOSAL

Gloves will deteriorate over time depending on the types and amount of chemicals they come in contact with. Remove excessive chemical residue that builds up on the glove. Replace cracked, ripped or torn gloves or when breakthrough occurs. Breakthrough is the time between initial contact of the chemical on the glove surface and the detection of the chemical on the inside of the glove. Tight-fitting gloves can cause fatigue while loose fitting gloves can be hazardous. Measure the circumference of your hand around the palm area. This measurement, in inches, is closest to your actual glove size. For example, 7" is equal to a size 7 glove. Always select the right size glove from the safety supply cabinet. Dispose of chemically-resistant gloves in accordance with the established protocols at your office.

# **PPE Fact Sheet – Chemical Protective Clothing**

Whenever there is a potential for chemical splashing, disposable, chemically-resistant clothing, such as a coated-Tyvek coverall or apron, will be worn. Examples of when such clothing may be required include:

- Cleaning of small spills;
- Washing and rinsing of the printing presses;
- Non-routine tasks involving the use of chemicals; and,
- The transfer of large quantities of chemicals from large containers to smaller ones.

The process for selecting chemically-resistant clothing will be similar to that described for the selection of chemically-resistant gloves. The need for chemically-resistant clothing will be determined by your health and safety coordinator. The required clothing will be issued to you by the SH&E coordinator. If there is an item that is routinely used by a specific group of employees within one department, the department manager can assume the purchasing responsibilities.

#### TYPES OF CHEMICALLY-RESISTANT CLOTHING

Like gloves, the objective of whole body protection is to separate the person from a contaminating or hazardous material. Disposable garments, such as Tyvek coveralls or aprons, provide this type of barrier. Uncoated Tyvek coveralls are made of a porous fabric and are designed to prevent contact with particulates. Coated Tyvek coveralls provide a nonporous barrier to protect the worker from chemical splash and vapors. Protective aprons, like chemically-resistant gloves, are made from nitrile or neoprene rubber.

#### PROPER FIT/CLEANING/DISPOSAL

Before donning a protective coverall, inspect it for rips or tears. Promptly remove any protective clothing that becomes ripped or torn during a particular task. Be sure the garment fits properly. The garment-to-glove seam will be taped when there is a potential for liquids to directly contact the skin because the arm of the suit shifted upward.

Single use garments, such as Tyvek coveralls will be disposed of in accordance with the environmental protocols at your office. Some clothing, such as rubber aprons, is meant for repeated use. Wipe down the apron, using soap and water, to remove any remaining liquids or residues.

|  | ΔΕζΟΜ | SH&E No.: | 201             |
|--|-------|-----------|-----------------|
| AECOM  |       | Rev:      | Original        |
| Incident Reporting                               |       | Deter     | October 5, 2000 |
| AECOM Safety, Health and Environmental Procedure |       | Dale.     | October 5, 2009 |

# 1.0 PURPOSE

To require that all SH&E incidents are documented and reported in a timely and accurate manner. Additionally, to require that appropriate Lessons-Learned are gathered from all SH&E incidents and that all information required for regulatory reports is generated and filed as required for compliance.

# 2.0 SCOPE

This procedure applies to all AECOM U.S.-based employees and operations.

# 3.0 DEFINITIONS

**SRI** – Supervisor's Report of Incident (see Attachment 2)

**SH&E Incidents** – The following events or situations as applied to AECOM employees and/or AECOM-controlled operations are considered SH&E Incidents:

- 1. Any work-related injury or illness to an AECOM employee or an AECOM subcontractor employee performing work at an AECOM-controlled location or project site.
- 2. Fire, explosion, or flash that is not an intended result of a remediation process, laboratory procedure, or other planned event.
- 3. Any accidents involving company-owned, rented, or leased vehicles (including personal vehicles used for company business).
- 4. Any breach of a numeric limit attached to a governmental permit or consent.
- 5. Any failure to perform the requirements of a non-numeric requirement contained in a government permit or consent.
- 6. Any failure to obtain a government permit or consent when required (including failure to obtain revisions before an existing permit or consent expires).
- 7. Any notice of violation or notice of non-compliance received from a regulatory authority with enforcement powers.
- 8. Property damage resulting from any AECOM or subcontractor activity.
- 9. Unexpected release or imminent release of a hazardous material.
- 10. Unexpected chemical exposures to workers or the public.
- 11. A safety, health or environmental related complaint from the public regarding AECOM activities.
- 12. SH&E-related incidents that could result in adverse public media interest concerning AECOM or an AECOM project.
- 13. Any inspection by a federal, state, or local safety, health, & environmental enforcement agency.
- 14. Near-Miss Incidents, defined as an incident having the potential to cause injury, health effects, environmental impairment, or property damage as described in the above categories but did not. Attachment 3 is used to report near-miss incidents.

#### SH&E 201: Incident Reporting

15. Significant Learning Experience, defined as a near-miss incident that the affected group (i.e. project team, office staff, etc.) believes could have wide-ranging impacts throughout AECOM.

**Fatality** – Loss of life of any AECOM employee, AECOM subcontractor personnel, client personnel or member of the general public that can be perceived to be related to work performed or controlled by AECOM.

Serious SH&E Incident – Any SH&E Incident that meets/involves the following criteria:

- Any amputation
- Any loss of consciousness
- Hospitalization for treatment (admission)
- Absence from work for more than 30 calendar days due to work-related injury/illness
- Fracture of a bone
- Any single event resulting in more than one employee requiring medical treatment
- Any SH&E-related Consent Agreement/Order/Lawsuit or enforcement action seeking more than \$10,000 or alleging criminal activity
- Any spill or release of a hazardous material that is reportable to a government agency
- Any Notice of Violation resulting from failure to operate within the requirements of a government permit or consent
- Near-miss incidents that, in the opinion of the Business Line Manager, Regional SH&E Manager, Regional Chief Executive, Group or Corporate SH&E Director, may have otherwise resulted in any of the above

#### 4.0 ROLES AND RESPONSIBILITIES

#### 4.1 EMPLOYEES

- Each employee involved in an SH&E incident must notify his/her supervisor immediately (see 5.1 and 5.2 for specific timing) that an incident (including a near-miss) has occurred, the circumstances involved, the nature and extent of the injuries/illness, and whether medical treatment may be required. Except for emergency situations, affected employees are required to discuss their injury/illness status with their supervisor and Regional SH&E Manager or project SH&E Professional prior to obtaining medical treatment.
- Assist supervisor in completing appropriate reporting and investigation forms.

#### 4.2 SUPERVISORS

- In an emergency/life-threatening situation, supervisors will use the appropriate local emergency phone numbers and seek immediate medical care for the employee.
- Follow the directions provided by the AECOM SH&E Incident Reporting Hotline (800-348-5046) by the end of the current work shift.
- Contact the Regional SH&E Manager if immediate procedural assistance is required.
- Complete the applicable sections of the incident reporting forms (e.g., Supervisor's Report of Incident [SRI] or Near-Miss Reporting Form) and fax a draft (or preliminary) copy to AECOM Corporate SH&E Department at (562-499-4012) within 24 hours of the incident.
- Notify the appropriate line or lead manager (i.e., manager responsible for personnel involved/project oversight/business line, etc.).
- As appropriate, initiate an Incident Investigation and Review per the requirements of SH&E SOP 204.



• Fatalities and/or serious SH&E incidents must be reported to the appropriate Regional SH&E Manager and/or Group SH&E Director as soon as reasonably possible but no more than **2 hours** after the incident.

## 5.0 PROCEDURE

#### 5.1 FATALITY OR SERIOUS SH&E INCIDENT NOTIFICATION

Any fatality or serious SH&E incident is to be directly reported as soon as practical (i.e. as soon as the site is secure and appropriate local emergency response is coordinated), but in no case more than 2 hours after the incident, to the appropriate Group Chief Executive, Regional Chief Executive, Regional SH&E Manager and Group SH&E Director. Voicemail and/or email alone are not adequate to meet this requirement. The responsibility for this reporting belongs to the responsible line manager (i.e. office /project manager).

Notification to external regulatory agencies (i.e. OSHA) is to be done in accordance with SHE SOP 205

# 5.2 MEDICAL TREATMENT INJURY, HAZARDOUS MATERIAL SPILL/RELEASE, PERMIT CONDITION NOTIFICATION

Any SH&E incident involving medical treatment for an AECOM employee, release of a hazardous material/substance and/or breach of a numeric or non-numeric permit/consent limit is to be reported as soon as possible, but not later than the end of the work-shift, to the Regional SH&E Manager, Regional/Business Line Manager and Group SH&E Director by using a direct communication method (face-to-face or phone call). Responsibility for this reporting belongs to the responsible project/location/department manager.

#### 5.3 INTERNAL SH&E INCIDENT <u>REPORTING</u>

The "Supervisor's Incident Reporting Flowchart" (Attachment 1) provides specific guidance on the steps necessary to report and document SH&E incidents.

### 6.0 REFERENCE MATERIAL

SH&E SOP 204 – Incident Investigation SH&E SOP 205 – OSHA Recordkeeping and Reporting

### 7.0 ATTACHMENTS

Attachment 1 – Supervisor's Incident Reporting Flowchart

Attachment 2 – Supervisor's Report of Incident

Attachment 3 – Near-Miss Incident Report

### 8.0 REVISION HISTORY

| Revision   | Date            | Change |
|------------|-----------------|--------|
| Original   | October 5, 2009 | N/A    |
| Revision 1 |                 |        |

| <b>Flowchart</b>    |  |
|---------------------|--|
| Reporting           |  |
| <u>Incident</u>     |  |
| <u>Supervisor's</u> |  |



SH&E 201, Attachment 1

10/5/2009



# Supervisor's Report of Incident

- 1. Seek immediate medical attention if necessary.
- 2. Employee must report all incidents to their supervisor immediately.
- 3. Supervisor calls the Incident, Injury and Near-Miss Reporting Line at (800) 348-5046.

# Section 1 - Organization Information

| Region:  | District:                     | Section/Dept Number: |  |  |  |
|--|-------------------------------|----------------------|--|--|--|
| □West □ Midwest □ Southwest/Mountain                   |                               |                      |  |  |  |
| Southeast Mid-Atlantic Northeast                       |                               |                      |  |  |  |
| Business Line:   |                               | Office Name:         |  |  |  |
| □ Infrastructure-Water □ Infrastructure-Transportation | Infrastructure-Energy & Power |                      |  |  |  |
| PDD-Facilities     PDD-Design     Environmen           | tal                           |                      |  |  |  |
| Client Name:   |                               | Project Number:      |  |  |  |
|  |                               |                      |  |  |  |
| Project Name:  |                               |                      |  |  |  |
|  |                               |                      |  |  |  |

# Section 2 - Type of Incident (SRI Sections to be Completed)

| Injury/ illness  | Vehicle Incident          | Property Damage          | Environmental Spill/Release |
|--|---------------------------|--------------------------|-----------------------------|
| (Sections 3, 4, and 7)                                   | (Sections 3, 4, 5, and 7) | (Sections 3, 4, 6 and 7) | (Sections 3, 4, and 7)      |
| Regulatory Inspection or Notification: (Sections 3, 4,7) |                           |                          | ☐ Other (describe)          |

# Section 3 – Contact/Incident Information

| Employee/Claimant Name:                                  |             | Employee Job Title:     | <ul> <li>Full-Time Employee</li> <li>Subcontractor/Subconsultant</li> <li>Temp Agency Employee</li> <li>Part-Time Employee</li> <li>Third Party Employee</li> </ul>  |
|--|-------------|-------------------------|--|
| Work Phone:  | Cell Phone: | Home Phone:             | Employee Number:   |
| Date/Time of Incident:                                   |             | Date/Time Reported to S | upervisor:   |
| Street Address of Incident or approximately:             |             | City:                   | State/Zip:   |
| Body Part Injured:                                       |             | Type of Treatment: M    | Iedical/hospital or doctor     Image: Constraint of the second seco |
| Medical Facility Contact Info:<br>(Name, Address, Phone) |             |                         |  |



# Section 4 - Descriptions of Incident (employee, supervisor and witness statements)

| Employee Signature:                 | Date and Time: |
|-------------------------------------|----------------|
| (use additional paper if necessary) |                |
|                                     |                |
|                                     |                |
|                                     |                |
|                                     |                |
|                                     |                |
|                                     |                |
|                                     |                |
|                                     |                |
|                                     |                |
|                                     |                |

Supervisor Description of Incident: (Supervisor signs in Section 7)

(use additional paper if necessary)

| Witness Name :                       | Witness Address: | Witness Phone No.: |
|--------------------------------------|------------------|--------------------|
|                                      |                  |                    |
| Witness Description of the Incident: |                  |                    |
| maless beschption of the monormal    |                  |                    |
|                                      |                  |                    |
|                                      |                  |                    |
|                                      |                  |                    |
|                                      |                  |                    |
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|                                      |                  |                    |
|                                      |                  |                    |
|                                      |                  |                    |
|                                      |                  |                    |
| (use additional paper if necessary)  |                  |                    |
| Witness Signature:                   |                  | Date and time:     |
|                                      |                  |                    |
|                                      |                  |                    |


## Section 5 - Vehicle Incident Information (fill out for motor vehicle incidents only)

| 5a - AECOM Driver Name:                                      |                                   | Drivers License #: |               | State Issued:                | Expiration      | Expiration Date: |          |
|--|-----------------------------------|--------------------|---------------|------------------------------|-----------------|------------------|----------|
| Vehicle Year:  | Make:                             | Model:             |               | Color:                       | License Pla     | ate:             | State:   |
| VIN Number:  |                                   | <u> </u>           |               |                              |                 |                  |          |
| AECOM Vehicle was  |                                   | Rented             | Who was       | AECOM Vehic                  | cle(Section 5a) | 🗌 Pe             | destrian |
|  |                                   | Personal Vehicle   | involved?     | Another Vehic                | le(Section 5b)  | Pro              | operty   |
| Use of Vehicle at Ti   | me of Incident:                   |                    | ·             | Vehicle Type:                |                 |                  |          |
| Office Visit   | ] Site Visit                      | Field Work         |               | Commercial Motor Vehicle     |                 |                  |          |
| Personal O   | ther                              |                    |               | Non Commercial Motor Vehicle |                 |                  |          |
| <u>5b</u> - Name of Other Driver:                            |                                   | Address:           |               | City: State/Zi               |                 | Zip:             |          |
| Work Phone:  |                                   |                    | Cell Phone:   | _                            |                 |                  |          |
| Date of Birth:   | Date of Birth: Drivers License #: |                    | State Issued: | Expiration Date:             |                 |                  |          |
| Vehicle Year:  | Make:                             | Model:             |               | Color:                       | License Plate:  | Sta              | te:      |
| VIN Number, Insurance Company Name, Insurance Policy Number: |                                   |                    |               |                              |                 |                  |          |

|  | Owner Name:                |               |  |
|--|----------------------------|---------------|--|
| If <i>Vehicle Owner</i> is different from driver then complete owner's contact information | Address, City, State, Zip: |               |  |
|  | Work Phone:                | Cell Phone:   |  |
| Authorities contacted?  Yes No   | If so, who responded?      |               |  |
| Citations Issued?  | Type of Citation:          | Person Cited: |  |

## Section 6 - General Liability (Fill out for property damage only)

| Description of damaged property: |             |
|----------------------------------|-------------|
| Where can the property be seen?  |             |
| Property Owner Name:             |             |
| Address, City, State, Zip:       |             |
| Work Phone:                      | Cell Phone: |



## **Section 7- Signatures**

### Supervisor

| Flint Name. Sigi | ignature: | Date: | Telephone: |
|------------------|-----------|-------|------------|
|                  |           |       |            |

## Office/Location Manager

| Print Name: | Signature: | Date: | Telephone: |
|-------------|------------|-------|------------|
|             |            |       |            |

## Regional SH&E Manager

| Print Name: | Signature: | Date: | Telephone: |
|-------------|------------|-------|------------|
|             |            |       |            |
|             |            |       |            |
| Comments:   |            |       |            |
|             |            |       |            |
|             |            |       |            |

Attention: This form must be completed and forward to the Regional SH&E Manager within one (1) business day following the occurrence of the incident.

# AECOM

|   | NEAR-MISS IN                          | ICIDENT REPORT         |       |       |
|---|---------------------------------------|------------------------|-------|-------|
| Name of Involved Employee(s)              |                                       | Date of Incident       | Time  | am/pm |
| Office Name                               | · · · · · · · · · · · · · · · · · · · | Date Reported          | Time_ | am/pm |
| Project Name                              | Job Number                            | State                  |       |       |
| Manager                                   | Supervisor                            |                        |       |       |
| Describe what happened. Please be precis  | 9                                     |                        |       |       |
| How could this incident have been avoided | ?                                     |                        |       |       |
| Recommended follow-up action(s):          |                                       |                        |       |       |
|   |                                       |                        |       |       |
| Supervisor's signature                    |                                       | Date                   |       |       |
|   | (If more room is n                    | eeded, use other side) |       |       |

|         | λεζομ                                      |       | 302             |  |
|---------|--|-------|-----------------|--|
|         |  | Rev:  | Original        |  |
| Risk As | sessment and Hazard Analysis               | Data  | October 5, 2009 |  |
| AECOM   | Safety, Health and Environmental Procedure | Date. | October 5, 2009 |  |

## 1.0 PURPOSE

Enhance SH&E performance and reduce losses due to injury, illness, property damage, or environmental impairment incident through a defined process of pre-work planning and risk assessment.

### 2.0 SCOPE

This procedure applies to all AECOM U.S.-based employees and operations that occur in a location other than an AECOM or client office and involve non-administrative activities.

#### 3.0 DEFINITIONS

Task Hazard Analysis (THA) or Job Safety Analysis (JSA) – A technique for evaluating the component parts of any work method or procedure for the purpose of: (a) identifying the SH&E hazards and risks connected with the work and requirements or qualifications of those who are to perform the work; (b) identifying and implementing control methods to eliminate, nullify, or reduce to a minimum the consequences of such hazards and risks; and, (c) evaluating the effectiveness of hazard and risk control measures and making modifications as needed.

#### 4.0 ROLES AND RESPONSIBILITIES

#### 4.1 REGIONAL SH&E MANAGER

Provide assistance to Project Managers (PM) and/or Site Supervisors in the development and review of risk assessments as required.

#### 4.2 REGIONAL, DISTRICT AND OFFICE MANAGERS

Require Project Managers (PMs) of projects within their areas of responsibility to conduct and properly document SH&E risk assessments in accordance with requirements of this procedure.

#### 4.3 PROJECT MANAGERS (INCLUDING FIELD TASK MANAGERS, SUPERVISORS)

- Plan project work activities so as to identify and address SH&E hazards and risks that may be encountered in accordance with this Standard Operating Procedure.
- Consult with the Regional SH&E Manager, as required, regarding the development of unique, out-of-theordinary risk assessments (e.g., high-risk hazardous materials handling/disposal situations, projects involving ionizing radiation hazards, high elevation or over-the-water exposures, etc.).
- Maintain a record of SH&E risk assessments, review them with staff, and make them available to project members.

#### 4.4 EMPLOYEES

Read, sign, and comply with recommended actions for any activity governed by a risk assessment program or document.



### 5.0 PROCEDURE

#### 5.1 GENERAL

Attention shall be given in advance to hazards and risks that may be encountered in the field and in the execution of "out of the ordinary" or unusual tasks.

Risk assessments made in anticipation of field work activities will be communicated to all AECOM employees, contract employees, and subcontractors who may be affected by the activities.

#### 5.2 COMPLETING A RISK ASSESSMENT

#### 5.2.1 Risk Assessment Work Sheet

- As part of the project planning sequence and as a minimum before work is performed on any project requiring field work, a Risk Assessment Work Sheet (Attachment 1 or equivalent) shall be filled out by the PM or designee. Findings should be shared with all project personnel (including contractors) in the form of a pre-work SH&E meeting.
- Risk Assessment Work Sheets are to be amended if found to be inadequate or if the original conditions on which the risk assessment is based change.

#### 5.2.2 THA/JSA

- Completion of a Risk Assessment Work Sheet will frequently demonstrate that a more detailed risk assessment tool is needed to focus in on SH&E hazards, risks, and control measures that are specific to the individual work tasks and field conditions that make up a particular project. The THA or JSA risk assessment technique shall be used for this purpose.
- Attachment 2 is provided as a sample THA/JSA. Because THA/JSA templates may vary slightly based on
  project type and task complexity, the Regional SH&E Manager should be consulted for the best template
  to use as needed.
- The PM is responsible for ensuring that one or more THA/JSAs are prepared for each project task that meets the criteria below:
  - o Work tasks that will put the employee at risk of serious injury.
  - Tasks requiring specialized (beyond routine) PPE requirements (e.g., air purifying respirator, fall protection, welding helmet or face shield, chainsaw chaps, etc.).
  - Tasks involving potential exposure to, or use of, hazardous materials or regulated substances.
  - Tasks that may be deemed as having an IDLH (Immediately Dangerous to Life or Health) component.
  - Tasks that, due to the location of activities, will place the employee at physical risk (e.g., elevated structures, work on or near active railways, highways and bridges, airport runways/taxiways, etc.).
- Project field activities for which at least one THA/JSA should be developed, include but are not limited to, the following:
  - Land Surveying
  - o Bid reviews (i.e., pre-bid meeting) walk-throughs
  - Confined Space entries
  - Data gathering (surveys/assessments/investigations)
  - o Facility auditing
  - Work involving operating systems, processes or piping that may contain or release hazardous energy or materials (e.g., vents, drains, tie-ins, opening lines, etc.).
- THAs or JSAs will be prepared by the supervisor directly responsible for the work. Final drafts shall be submitted for review and approval by the site supervisor, PM and responsible SH&E Department

representative prior to commencing work activities. Copies will be forwarded to the SH&E Department supporting the project for review as appropriate.

- AECOM subcontractors will prepare their own THA/JSAs and submit them to the PM (a minimum of 48 hours prior to the scheduled operation is desired) for review, comment and acceptance prior to start of subcontracted work activities. These reviews are not approvals, and do not relieve the subcontractor for being responsible for their own safety on the project site.
- The PM shall ensure that approved/signed THA/JSA copies (including revisions) are maintained in the project files and made available during project audits or to train new project personnel as appropriate.
- As appropriate, THAs or JSAs shall be used to facilitate project SH&E tailgate meetings. Comments and suggestions relative to the completed THA/JSA shall be encouraged from attendees and incorporated into revised documents when necessary.
- After the completion of tasks or activities, THA/JSAs that have been found to be inadequate or incomplete should be suitably annotated by the project management team to ensure that lessons learned are recorded and distributed for future reference.

#### 5.2.3 Personnel Acknowledgement of THA

Prior to field work activities, the PM shall ensure that one or more training sessions are conducted with project personnel to explain site SH&E findings per the Risk Assessment Work Sheet process and to review each THA/JSA. For each THA/JSA, each person must sign the THA/JSA Sign-Off Log as acknowledgement that task-specific safety requirements are understood as written in the THA/JSA

#### 5.2.4 Risks in Design Projects

Project delivery requires that designs consider SH&E risks in accordance with recognized industry standards, contract specifications and/or client requirements. Considerations for risk assessment of design projects and other non-construction field services (i.e. site surveys, field investigations) include the following:

- The first such assessment is ideally carried out at the commencement of design to identify major decisions which may eliminate or significantly reduce safety and health hazards.
- Other assessments may be required at various stages of the design process to be decided by the PM.
- Designers should be aware of SH&E implications of their designs. Any design output, such as construction contract documents, specifications, method statements and the like, is assessed for hazards and risks. Those hazards and risks which cannot be designed out are brought to the attention of those requiring the information (e.g. other designers, contractors, planning supervisors, clients, etc.)

#### 6.0 REFERENCE MATERIAL

SH&E SOP 301 – Project SH&E Planning

#### 7.0 ATTACHMENTS

Attachment 1 – Risk Assessment Work Sheet

Attachment 2 – Task Hazard Analysis (THA) Sample and THA Sign-Off Log

#### 8.0 REVISION HISTORY

| Revision   | Date            | Change |  |
|------------|-----------------|--------|--|
| Original   | October 5, 2009 | N/A    |  |
| Revision 1 |                 |        |  |

## **RISK ASSESSMENT WORK SHEET**

Date:

Job/Workplace/Location:

Person(s) Performing Assessment:

<u>Name</u>

<u>Title</u>

Will any of the hazards listed below be present during the anticipated work? Begin the Risk Assessment by answering YES or NO to each numbered potential workplace hazard category (worded in Bold). Below each numbered hazard category is a partial list of those hazards that may be present on field project sites. While this list is not intended to be all inclusive, it will provide a starting point. In the block immediately below each listed hazard is a suggested list of PPE that should be considered to enhance employee safety, and a list of other control measures recommended to achieve a reduction of risk. "Other" control measures for each hazard category should be listed as well in the space provided.

The second to the last step is to reflect on the "whole project picture" and, if applicable, fill in the ADDITIONAL HAZARD CONTROL PLANNING block located at the end of the work sheet. The last step is to share findings with the project team and write up and implement one or more Task Hazard Analysis (THA) or Job Safety Analysis (JSA) as appropriate.

1. Eye and/or Face Hazards Flying particles, molten metal, liquid chemicals, acids or caustic liquids, chemical gases or vapors, potentially injurious light radiation, etc.

Safety Glasses and/or goggles will be required at all times while on site. Face Shield for grinding, cutting etc., will be worn as required. Burning glasses and welding helmets will be utilized when required. When welding proper protective screens to be used if possible.

Other:

Potential Injury to Head: YES NO
 Falling objects, storage above head level, other overhead work, cranes, hoists, booms, scaffold, and other lifting devices.

Class B Hard Hat is to be worn at all times while on site, to protect from falling debris and any other potential head injuries. Note: Class B hard hats are tested to 20,000 volts.

Other:

#### 3. Foot Injuries Falling or rolling objects, objects that pierce the sole, electrical hazards, etc.

Work Boots 6" High with preferably composite toe and defined heel (Fiber) will be worn at all times. Be aware of debris that could cause twisting or tripping and puncture injuries.

Other:

| glove                  | es may be needed consult MSDS.   |  |  |
|------------------------|--|--|--|
| Othe                   | ər:  |  |  |
| 5. 7                   | Temperature Extremes:<br>Ambient air temperatures, heat exhaustio  | <b>□ YES</b><br>n, heat stroke, f                          | □ NO<br>frost bite   |
| Prop<br>empl<br>heat/  | per protective clothing to be worn adequate<br>loyees on site for hydration. Adequate breaks<br>/cold conditions.                                | for given weat<br>s will be taken by                       | ther conditions. Potable water will be made available to<br>y employees to relieve them of exhaustion during extreme   |
| Othe                   | ər:  |  |  |
| 6. I                   | Impact Sources<br>Falling or dropping objects, rolling or pinching   | DYES<br>objects, etc.                                      |  |
| Be a<br>and i          | aware of the possibility of falling objects whet<br>under material properly secured and/or reloca  | her tools, mater<br>ated. All material                     | rial or debris. Job safety walk-through to ensure overhead<br>I will be securely stored against falling objects.   |
| Othe                   | ər:  |  |  |
| 7. I                   | <b>Penetration Sources</b><br>Sharp objects that can pierce cut or impale pa   | <b>TYES</b> arts of the body.                              | □ NO<br>Presence of bloodborne pathogens   |
| Be a<br>skin.<br>prote | aware of sharp objects protruding from wall o<br>. Safety tool box meetings to alert employe<br>ection where required. Local first aid to be ava | r lying on the gr<br>es or potential<br>ailable along with | round, which could pierce cut or impale boots, clothing or<br>points. Safe off areas where possible. Install rebar cap<br>h emergency communication and contact numbers. |
| Othe                   | ər:  |  |  |
| 8. (                   | <b>Compression Sources</b><br>Use of compactors, rollers, etc. Trenches and  | <b>YES</b> excavations.                                    |  |
| Wato                   | ch for pinch points when handling planks, reba   | ar, forms and all  | l other material.  |
| Othe                   | er:  |  |  |
| 9. (                   | Confined Space   |  |  |
| Emp<br>extra           | bloyees entering Permit-required spaces sha  | II have the prop<br>dequate air circu                      | per OSHA training. Ensure air monitoring, fall arrest and ulation, proper means of egress, etc.  |
| Othe                   | er:  |  |  |

#### 4. Hand Injuries

Hazards such as skin absorption of harmful substances, severe cuts, lacerations, abrasions, punctures, chemical burns, and temperature extremes.

ocietant

Work Cloves will be wided Th w will be worn whonovor sible who n handlir otorial rkir Ch mical r





AECOM



#### 16. Radiation Sources

#### 

Light or heat radiation, "hot work" permits, X-Ray for Quality assurance purposes, etc.

Proper gloves and eye protection must be used during cutting and welding operations. Proper shielding must be used to protect surrounding environment. Proper permits (hot work) in place. X-Ray has special licensing and training requirements.

| Other:  |                              |   |                    |
|---|------------------------------|---|--------------------|
| 17. Noise Sources<br>Sound levels, etc.   |                              |   |                    |
| Proper hearing protection must be used during to ensure sound levels are within guidelines. | g concrete chippir           | ng/breaking. Proper sound attenuation de                    | vices will be used |
| Other:  |                              |   |                    |
| 10 Lighting   |                              |   |                    |
| Adequate lighting, etc. 5 foot candles minir  | mum for general c            | construction.   |                    |
| All work areas and stairways will be adequately   | y lit. Proper lumina         | ary devices will be provided. Task lighting                 | is an alternative. |
| Other:  |                              |   |                    |
| <b>19. Biological:</b><br>Will there be biological hazards such as sn                       | □ YES<br>nakes, stinging ins | <b>D NO</b><br>ects, poisonous plants, ticks, spiders, etc. |                    |
| Appropriate training on species identification a  | nd provision of PP           | 'E (snake gaiters/chaps, etc.).                             |                    |
| Other:  |                              |   |                    |

#### ADDITIONAL HAZARD CONTROL PLANNING:

List any additional measures to be taken to avoid known or projected hazards. The goal is to provide, as far as practical, a lowered and acceptable risk level for all personnel involved in the planned project work activities.

# TASK HAZARD ANALYSIS (THA) – SAMPLE

## TASK NAME AND LOCATION

| MOBILIZATION / DEMOBILIZATION / SITE SET-UP – ANYWHERE, USA  |  |  |   |  |  |  |
|--|--|--|---|--|--|--|
| TASK D   | ESCRIPTION   |  | CHEMICAL HAZARDS  |  |  |  |
| This task hazard analysis refers to the proc<br>materials to complete the tasks outlined<br>primarily to securing identification badges<br>materials, and the set up of project trailers<br>not cover the actual hazards present within<br>whenever new materials are brought to the   | emobilizing people and<br>rk Plan. This applies<br>ing of equipment and<br>zones. This THA does<br>eas. This THA applies<br>site.  | None anticipated   |   |  |  |  |
| PPE AND OTHER SAFETY<br>EQUIPMENT  | PHYSICAL HAZARDS   |  |   |  |  |  |
| <ul> <li>Level D</li> <li>High-visibility reflective safety vest</li> <li>ANSI approved hardhat.</li> <li>ANSI approved safety glasses.</li> <li>ANSI approved steel toe safety shoes/boots.</li> <li>Other PPE:</li> <li>Leather gloves when handling sharp object or operating powered equipment</li> <li>Hearing protection (minimum 29 NRR)</li> <li>Fall protection (contact Safety Professional)</li> </ul>  | <ul> <li>Emergency contact numbers</li> <li>Evacuation plan</li> <li>Emergency participants and roles</li> <li>Reporting and communicating<br/>emergencies</li> <li>Supplies</li> <li>Procedure</li> </ul> |  | <ul> <li>Heavy lifting (objects over 49 pounds)</li> <li>Equipment traffic (heavy equipment, street traffic, etc.)</li> <li>Slips/trips/falls; uneven terrain</li> <li>Protruding/sharp objects</li> <li>Utilities (overhead electrical, etc.)</li> <li>Work / falls from elevated heights (site trailer set-up, etc.)</li> <li>Heat/cold stress</li> <li>Hazardous noise levels</li> </ul> |  |  |  |
| <ul> <li>Flashlights/Lighting</li> <li>First aid kit</li> <li>Fire extinguisher</li> </ul> AppLICABLE STANDARD OPERATION   | ING PROCEDURES   | ADDITIONAL S   | Inadequate lighting     SAFETY ISSUES AND CONTROLS  |  |  |  |
| <ul> <li>SH&amp;E 103, Safe Work Standards and Rules</li> <li>SH&amp;E 116, Personal Protection Equipment</li> <li>SH&amp;E 118, Competent Persons</li> <li>SH&amp;E 303, Planning for Safety and Risk Assessment</li> <li>SH&amp;E 305, Site Safety Officer</li> <li>SH&amp;E 307, General Housekeeping / Accountability</li> <li>SH&amp;E 502, Hazardous Materials Shipping</li> <li>SH&amp;E 602, Elevated Work Platforms and Aerial Equipment</li> <li>SH&amp;E 604, Manual Lifting</li> <li>SH&amp;E 710, Heavy Equipment</li> <li>SH&amp;E 713, Confined Space Entry Program</li> <li>SH&amp;E 804, Overhead Electrical Lines</li> <li>SH&amp;E 805, Hand and Pawar Tapla</li> </ul> |  | <ul> <li>Locate power lines on site prior to beginning operations. If work will occur within 50 feet of power lines, refer to SH&amp;E 804 for protection requirements.</li> <li>All loads in excess of 49 pounds require use of mechanical handling aids or assistance from other personnel.</li> <li>Use spotters when loading/unloading heavy equipment such as forklifts, etc. Stand clear of these operations.</li> <li>Do not enter tank, vats, sumps, holes, or other potential confined spaces without a Confined Space Entry Procedure, Hazard Evaluation, and Entry Permit completed. A competent person must be assigned.</li> <li>Ensure all equipment and chemicals are suitable for transportation – Hazmat shipping has been adhered to (Check with the T&amp;D department if you are unsure).</li> <li>Ensure that equipment, materials, chemicals, etc. have been secured for transportation</li> <li>DO NOT overload trucks, trailers, etc. If more room is needed.</li> </ul> |   |  |  |  |
|  | Monitoring   | or loads are to large  | e, obtain additional transportation resources.  |  |  |  |
| WIONITORING PROCEDURES   |  |  |   |  |  |  |

Monitoring is not anticipated for this task.

# TASK HAZARD ANALYSIS SIGN-OFF LOG (Sample)

## TASK NAME: MOBILIZATION / DEMOBILIZATION / SITE SET-UP – ANYWHERE, USA

**APPROVAL SIGNATURES** 

SITE SAFETY OFFICER:

PROJECT MANAGER:

SITE SUPERVISOR:

| I HAVE READ OR HAVE BEEN BRIEFED ON THE HAZARDS AND PROTECTIVE MEASURES IDENTIFIED FOR THE ABOVE-<br>LISTED TASK AS PRESENTED IN THE THA, AND FULLY UNDERSTAND THE TASK-SPECIFIC SAFETY REQUIREMENTS<br>THAT HAVE BEEN ESTABLISHED FOR IT. |               |                    |               |  |  |
|--|---------------|--------------------|---------------|--|--|
| DATE   | EMPLOYEE NAME | EMPLOYEE SIGNATURE | EMPLOYER NAME |  |  |
|  |               |                    |               |  |  |
|  |               |                    |               |  |  |
|  |               |                    |               |  |  |
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|  |               |                    |               |  |  |

|  | SH&E No.: | 303            |
|--|-----------|----------------|
| ALCOM  | Rev:      | 1              |
| Evaluation of Subcontractors                     | Data      | Marah 12, 2010 |
| AECOM Safety, Health and Environmental Procedure | Date.     | March 12, 2010 |

## 1.0 PURPOSE

Provides a process through which AECOM Subcontractor SH&E programs are evaluated to determine if the use of that Subcontractor will pose an unacceptable risk to AECOM and/or its Clients, employees, equipment, or property.

#### 2.0 SCOPE

This policy applies to all AECOM U.S.-based employees and operations.

#### 3.0 DEFINITIONS

AECOM field site – A site at which AECOM is providing field-related services.

#### 4.0 ROLES AND RESPONSIBILITIES

#### 4.1 REGIONAL BUSINESS LINE MANAGEMENT

Regional Business Line Management is responsible for:

- Maintaining a database (recommended) where all subcontractor SH&E performance data is maintained,
- Communicating changes in the operation or function of the database to appropriate staff,
- Providing the Regional SH&E Manager individual contractor AECOM Safety Questionnaire (below) responses for evaluation.

#### 4.2 SUBCONTRACTOR SELECTION MANAGERS

Project Managers, Proposal Managers, Procurement Managers and Field Task Managers are responsible that all subcontractor organizations scoped to perform field activities either for or in support of AECOM operations have been properly qualified for SH&E. This includes:

- Ensuring that the requirements identified in Section 5.0 are completed for all organizations subcontracted to perform field-based activities for AECOM,
- Providing a copy of the completed *Subcontractor Safety Criteria Questionnaire* to the Procurement Department for upload into its database (Attachment 1),
- Verifying a contract company's minimum level of insurance coverage as stipulated by AECOM's Legal and Procurement Departments (Workers' Compensation, Auto Insurance, General Liability, etc.).

#### 4.3 PROCUREMENT FUNCTION

Procurement function leads are responsible for:

- Providing the Regional SH&E Manager with Contractor Safety Questionnaire submissions for evaluation,
- Maintaining the database.
- 4.4 REGIONAL SH&E MANAGER

Each Regional SH&E Manager is responsible for:



- Assisting the Proposal, Project or Procurement Manager in evaluating qualified Subcontractors,
- Evaluating the Subcontractor Safety Criteria Questionnaire.

#### 5.0 PROCEDURE

#### 5.1 SUBCONTRACTOR SELECTION REQUIREMENTS

For all subcontractor organizations used to provide activities at AECOM field sites, the selection process will include consideration of the candidate firms' SH&E management and performance indicators. This will be accomplished using a subcontractor instruction and evaluation process that includes the following requirements:

- Subcontractor bids/submittals must include a completed Subcontractor Safety Criteria Questionnaire section as part of the standard Subcontractor Questionnaire (available on the AECOM Intranet site). Each questionnaire will be evaluated by the SH&E Department and the PM or Procurement Department Subcontract's Administrator, as necessary, during the subcontractor selection process to identify any organizations whose past SH&E performance may disqualify them from selection.
- Selected subcontractor firms are required to provide copies of any SH&E documentation (e.g., HASP, manual of safety procedures, employee training/medical monitoring certifications) to the Project Manager prior to the start of their on-site operations.
- The evaluation of a subcontractor's SH&E performance should be measured against the Subcontractor Safety Criteria Questionnaire Scoring Key (See Attachment 2). The criteria used to evaluate a contractor is based on federal OSHA, United States Bureau of Labor Statistics (BLS), and United States insurance data. Offshore locations should replace benchmark data with comparable meaningful data used in that country.
- Although the questionnaire is to be used as a guideline to determine whether a bidder's safety and health record is acceptable, there are no simple pass/fail criteria. The guidance outlines the standards AECOM's SH&E Department has established to reflect performance acceptability. Marginal performance (e.g., Score is determined to be Acceptable (2)) will require evaluation for final approval of a subcontractor by the PM in coordination with the SH&E Department.

#### 5.2 SUBCONTRACTOR SH&E REQUIREMENTS

Subcontractor organizations are responsible for safely performing their assigned work activities in accordance with all applicable federal and state occupational safety and health regulations. Subcontractors will also be provided with AECOM's project-specific SH&E documentation for the specification of minimum acceptable on-site SH&E performance. If at any time the subcontractor obtains the services of a subcontractor, consultant, or lower tier subcontractor for any portion of the work to be performed, a copy of the Statement of Work and the approved project-specific SH&E documentation shall be provided as part of the package submitted to each respective subcontractor, consultant, or lower-tier subcontractor. The subcontractor shall submit in writing to the PM, prior to the start of work, the names of any lower-tier subcontractors that may be used in the project yet to be approved. Subcontractors are responsible for ensuring that their employees are provided the appropriate equipment, training, and medical surveillance to perform the work safely.

#### 5.1 PROCUREMENT/BIDDING PHASE

The following conditions shall be incorporated into the bid documentation (either via the AECOM project-specific SH&E documentation, or the General Requirements).

Prior to starting fieldwork, each subcontractor organization shall provide the AECOM PM with at least one of the following for review and acceptance:

- Site-specific SH&E documentation addressing specific performance requirements for the subcontractor's on-site work activities, site safety coordinator's name and OSHA competent persons; or
- A written statement of adoption of the provisions in AECOM's project SH&E documentation as the subcontractor's minimum procedures while working on the job site. This documentation must be in letter format (company letterhead), and must include the following information:



- Site location
- o Anticipated scope of work activities to be performed by the subcontractor
- Name of the subcontractor's Site Safety Officer, with contact phone numbers
- Name of the subcontractor's Health and Safety Manager, with contact phone numbers
- In addition to the subcontractor's own SH&E requirements, a statement adopting the AECOM's project SH&E documentation as the subcontractor's minimum requirements for the project
- Statement requiring that only qualified and trained personnel (to the level of assigned responsibilities) will perform assigned work activities on the site
- Designation of required personal protective equipment anticipated for the subcontractor's assigned work activities
- Copies of supplemental or additional subcontractor-specific provisions, policies, procedures and/or protocols that will be implemented by the subcontractor during site activities
- The above shall be provided by AECOM in the procurement/bidding phase.

#### 5.3 AECOM ENVIRONMENT ADDENDUM

For Subcontractors used in support of AECOM Environment managed projects the subcontractors must be reviewed using the additional procedures in the AECOM Environment Addendum to this Procedure.

#### 6.0 REFERENCE MATERIAL

None

#### 7.0 ATTACHMENTS

Attachment 1 – Subcontractor Safety Criteria Questionnaire

Attachment 2 – Subcontractor Safety Criteria Questionnaire Scoring Key

AECOM Environment Addendum

#### 8.0 REVISION HISTORY

| Revision   | Date            | Change                                    |
|------------|-----------------|---|
| Original   | October 5, 2009 | N/A                                       |
| Revision 1 | March 12, 2010  | Addition of AECOM<br>Environment Addendum |



# Attachment 1 Subcontractor Safety Criteria Questionnaire

# INSTRUCTIONS TO SUBCONTRACTOR/ORGANIZATION COMPLETING THE AECOM SUBCONTRACTOR SAFETY CRITERIA QUESTIONNAIRE

- 1. Complete the administrative information related to your organization (Company name, address, etc.)
- 2. List the service(s) to be performed for AECOM by your organization (direct hire or own forces only, not subcontracted). Examples include (*but are not limited to*):
  - a. Subsurface drilling
  - b. Excavation operations
  - c. Surveying
  - d. Construction/renovation/clean-construction operations
  - e. Demolition
  - f. Well abandonment
  - g. Electrical system installation
  - h. HAZWOPER
- 3. List the Experience Modification Rate (EMR) for your organization (entire company, not a local office, division, subsidiary, or joint venture) from the past three years. This information can be obtained from your organization's Worker's Compensation Insurance Carrier. If your organization's EMR is greater than **1.0**, an explanation must be provided in the appropriate space provided. <u>NOTE:</u> *EMR is separate from the Experience Modification Factor (EMF) also provided by your Worker's Compensation Insurance Carrier. EMR is a whole number, while EMF is a percentage.*
- 4. Provide the applicable injury and illness data for your organization from the past three years in the table provided. Using the formulas included in the table, calculate the requested Recordable Case Frequency Rate (e.g., Recordable Incident Rate or RIR). If your company has less than ten employees, you are not required to maintain this information according to Title 29 of the Code of Federal Regulations (CFR) Part 1904, Section 1, Subsection (a)(1) [29 CFR 1904.1(a)(1)]; however, if your organization does have less than 10 employees, AECOM still requires that you provide the information for rows d) Total Recordable Cases and e) Total Corporate Hours Worked.
- 5. List any fatalities your organization has incurred during the past three years and for each occurrence please provide the following information (*Supplemental material may be attached to this questionnaire*):
  - a. Location where the fatality occurred
  - b. Cause of the fatality
  - c. What corrective action(s) your organization has taken as a result of the fatality
- 6. List and describe any SERIOUS, REPEAT, WILLFUL, or CRIMINAL citations issued to your organization by the U.S. Occupational Safety and Health Administration (OSHA) or a State with a federally-approved OSHA Plan (*Supplemental information related to the specific citation(s) may be attached to the questionnaire*). The list of States with a federally approved OSHA Plan is available at <u>http://www.osha.gov/fso/osp/index.html</u>.
- 7. After reading the Compliance Statement on page 3, list the name and phone number of the representative from your organization who completed the questionnaire, sign the questionnaire, and write in the date the questionnaire was completed. By signing the questionnaire, the representative states that they have truthfully answered all questions, that all of the information provided is accurate, and that if selected by AECOM, your organization shall adhere to the requirements identified in the Compliance Statement.
- 8. Based on the types of services to be provided by the contractor, other qualification criteria is recommended for use including but not limited to:



- a. Identity and qualifications of site safety officer
- b. Training qualification(s) of employees (e.g., certifications, permits, etc.)

Should the subcontractor have any questions regarding this questionnaire, please contact the AECOM PM.

| Comp                     | bany N   | lame:   |   | Date:   |   |   |
|--------------------------|--|---|---|---|---|---|
| Addre                    | ess:   |   |   | ·   |   |   |
| City:                    | ty:  |   |   |   |   |   |
| Has c                    | ompa   | iny name ch   | anged in the last 3 years (YES/NO   | D):   |   |   |
| TYE                      | s, plea  | ase provide p   | previous operating name(s):   |   |   |   |
| _ist S                   | ervice   | e(s) to be pro  | ovided:   |   |   |   |
| I. E                     | xperie   | ence Modific  | ation Rates   |   |   |   |
| a                        | ) List<br>fror   | t your firm's<br><i>m your Work</i>   | Experience Modification Rate (EN<br>ers' Compensation Insurance Ca  | /IR) for the three (3<br><i>rrier</i> )           | B) most recent years.                                     | (Information is availab                     |
|                          |  | Year  |   | Interstate  |   |   |
|                          |  |   |   |   |   |   |
|                          |  |   |   |   |   |   |
|                          |  |   |   |   |   |   |
| b                        | ) If y   | our organiza  | tion does not have an EMR or yo   | ur EMR is greater                                 | than 1.0, please expl                                     | lain why.                                   |
| b<br>2. P<br>fc          | ) If y   | our organiza<br>consolidate   | tion does not have an EMR or yo<br>your firm's OSHA Form 300 injur  | ur EMR is greater                                 | than 1.0, please expl                                     | lain why.                                   |
| b<br>2. P<br>fc          | ) If y   | our organiza<br>consolidate<br>ng:  | tion does not have an EMR or yo<br>your firm's OSHA Form 300 injur  | ur EMR is greater<br>y and illness data t<br>Year | than 1.0, please expl<br>for the last three (3) y<br>Year | lain why.<br>/ears and complete the<br>Year |
| b<br>2. P<br>fc          | ) If y   | our organiza<br>consolidate<br>ig:  | tion does not have an EMR or yo your firm's OSHA Form 300 injur   | ur EMR is greater<br>y and illness data t<br>Year | than 1.0, please expl<br>for the last three (3) y<br>Year | lain why.                                   |
| b<br>2. P<br>fc          | ) If y   | our organiza<br>consolidate<br>ng:<br>Number of<br>(not days lo   | tion does not have an EMR or yo your firm's OSHA Form 300 injur Data Lost Workday Cases ost)  | ur EMR is greater<br>y and illness data t<br>Year | than 1.0, please expl<br>for the last three (3) y<br>Year | lain why.                                   |
| b<br>2. P<br>fc          | ) If y<br>lease<br>bllowin<br>a)<br>b)                   | our organiza<br>consolidate<br>ng:<br>Number of<br>(not days lo<br>Number of<br>(not restrict   | tion does not have an EMR or yo your firm's OSHA Form 300 injur Data Lost Workday Cases ost) Restricted Workday Cases ied days)   | ur EMR is greater<br>y and illness data t<br>Year | than 1.0, please expl                                     | lain why.                                   |
| b<br>. P<br>fc           | ) If y<br>lease<br>bllowin<br>a)<br>b)<br>c)             | our organiza  | tion does not have an EMR or yo your firm's OSHA Form 300 injur Data Data Lost Workday Cases ost) Restricted Workday Cases red days) Medical Treatment Cases* ng first aid)   | ur EMR is greater<br>y and illness data t<br>Year | than 1.0, please expl                                     | lain why.                                   |
| b <u>.</u><br>2. P<br>fo | ) If y<br>lease<br>bllowin<br>a)<br>b)<br>c)<br>d)       | our organiza<br>consolidate<br>ng:<br>Number of<br>(not days lo<br>Number of<br>(not restrict<br>Number of<br>(not includi<br>Total Reco<br>(a + b + c)                               | tion does not have an EMR or yo your firm's OSHA Form 300 injury Data Data Lost Workday Cases ost) Restricted Workday Cases red days) Medical Treatment Cases* ng first aid) rdable Cases                                       | ur EMR is greater<br>y and illness data t<br>Year | than 1.0, please expl                                     | lain why.                                   |
| b<br>2. P<br>fc          | ) If y<br>lease<br>bllowin<br>a)<br>b)<br>c)<br>d)<br>e) | our organiza<br>consolidate<br>ng:<br>Number of<br>(not days lo<br>Number of<br>(not restrict<br>Number of<br>(not includi<br>Total Reco<br>(a + b + c)<br>Total Corpo<br>(hourly and | tion does not have an EMR or yo your firm's OSHA Form 300 injur Data Data Lost Workday Cases ost) Restricted Workday Cases red days) Medical Treatment Cases* ng first aid) rdable Cases prate Hours Worked salaried employees) | ur EMR is greater<br>y and illness data t<br>Year | than 1.0, please expl<br>for the last three (3) y<br>Year | lain why.                                   |

\*Medical Treatment Case is a case in which an on-the-job injury requires *other* than first aid treatment (and is not considered a restricted or lost workday) as defined by the U.S. Bureau of Labor Statistics recordability criteria (i.e., prescribed medication, physical therapy - more than one visit, fractures, imbedded foreign body, etc.). First aid injury treatment cases are *not* required to be added to the OSHA Form 300 log.

a) Does your organization have fewer than 10 employees?

Note: If you check Yes, you are required to only complete rows d) and e) in the above table.



| 3.        | List<br>( <i>Atta</i>   | any fatalities your firm ha<br>ach supplemental informa | as had in the last three (3) yea<br>ation as required) | ars. Include | location, cause, and co | prrective actions. |  |
|-----------|---|---|--|--------------|-------------------------|--------------------|--|
| 4.        | 4. List any OSHA SERIOUS, REPEAT, WILLFUL, or CRIMINAL citations your firm has had in the last three (3) years.<br>Please describe. (Attach supplemental information as required) |   |  |              |                         |                    |  |
| 5.        | Do y<br>If ye   | ou have a written safety a solution of Co               | and health manual? Yes<br>ontents.                     | No           |                         |                    |  |
| Co        | mple  | ted by Subcontractor N                                  | /anager (Print Name):                                  | Complete     | ed by (Signature):      |                    |  |
| Ph        | one l   | Number:   |  | Date Cor     | npleted:                |                    |  |
| Pro       | ocur  | rement/Safety/Mana                                      | gement Use Only  |              |                         |                    |  |
| Ev        | alua  | ited by:  | Evaluated by (Signa                                    | ture):       | Region                  | Date:              |  |
| <u>EN</u> | <u>IR R</u>   | Rating  | Incident Rating  | <u>OSH</u>   | A Comp. Rating          | OVERALL RATING*    |  |

\*The lowest of the three individual criteria ratings.

<u>Evaluator Note:</u> If the organization checked YES to 2.a), they only need to provide the applicable data for rows d) and e) in the table in Section 2, and the evaluator will calculate the RCFRs by applying the formula found in row f). If the organization checked NO, then they must provide <u>all</u> requested data to be considered compliant.



# Attachment 2 Subcontractor Safety Criteria Questionnaire Scoring Key

| <u>EMR<sup>1</sup></u> | Incident Rate<br>(RCFR) <sup>2</sup> | OSHA Compliance <sup>4</sup>                                    |   | Scores and Ratings   |
|------------------------|--------------------------------------|---|---|--|
| < 1.0                  | < 5.0                                | No regulatory citations   | 3 | Preferred - Meets AECOM requirements as acceptable.  |
| 1.1 - 1.5              | 5.0 – 7.5                            | 1 SERIOUS, REPEAT,<br>WILLFUL, or CRIMINAL<br>citation          | 2 | <b>Qualified</b> - Acceptable with concurrence from the Safety Dept<br>and provision of a method statement describing avoidance of<br>associated experience. |
| > 1.5                  | > 7.5                                | 2 or more SERIOUS,<br>REPEAT, WILLFUL, or<br>CRIMINAL citations | 1 | <i>Not Recommended</i> - Not recommended that the company receive subcontracts at this time.   |
| No data                | No Data <sup>3</sup>                 | No Data   | 0 | Non-responsive - Cannot receive subcontracts at this time.   |

 $^{1}$  – Use the greater of: (a) the most current year, or (b) the 3-year average value.

 $^{2}$  – If there are any job-related fatalities in the last 3 years then the highest possible score is 2, regardless of reported RCFR.

<sup>3</sup> – If Question 2.a) is checked **YES** then the RCFR must be calculated by the evaluator using the formula found in row f) and the information reported in rows d) and e). If this data is not supplied to AECOM, then the score is 0.

<sup>4</sup>– OSHA Compliance experience for the prior 3 years



# Attachment 3 AECOM Environment Addendum

| Appendix A | Additional Procedural Requirements                                  |
|------------|---|
| Appendix B | Subcontractor Questionnaire   |
| Appendix C | AECOM SH&E Policy Statement   |
| Appendix D | Subcontractor Safety Criteria Questionnaire (SSCQ) Review Checklist |
| Appendix E | Post-Project Subcontractors SH&E<br>Evaluation                      |
| Appendix F | SSCQ Review Criteria Flowchart                                      |



# Appendix A

## **Additional Procedural Requirements**

#### 3.0 DEFINITIONS

#### ENV – AECOM Environment

### 4.0 ROLES AND RESPONSIBILITES

#### 4.5 ENV PROJECT MANAGERS

Project Manager is responsible for reviewing the SH&E qualifications of their subcontractor and ensuring that a review has been completed within the previous year. If a subcontractor's qualifications are expired the PM is responsible for initiating the annual review process with the assistance of the ENV SH&E Administrator.

If the client has specific requirements beyond AECOM ENV minimum criteria that must be met (either additional requirements or a broader definition of services that are subject to the requirements), it is the Project Manager's responsibility to communicate these requirements to the subcontractor and provide them with assistance in fulfilling these requirements.

The Project Manager will assure that a post project review is conducted on subcontractors' SH&E performance and that the results of the review are communicated to the Corporate SH&E department.

#### 4.6 ENV DIRECTOR – SH&E PERFORMANCE

- Review and update this policy and procedure annually at a minimum.
- Ensure provisions and requirements of this policy/procedure are available on the AECOM ENV Intranet.
- Assist the geographic regions with the implementation of this procedure within local customs and legal systems.
- Audit operations to assess implementation of these procedures on applicable AECOM ENV projects.
- Assign a Safety, Health, and Environmental Administrator to perform the duties as described below.

#### 4.7 ENV REGIONAL OPERATIONS MANAGERS

- Facilitate the development and implementation of the subcontractor review process within the local laws and customs.
- Train Project Managers within the region on the requirements of this Procedure.

#### 4.8 ENV REGIONAL SAFETY, HEALTH AND ENVIRONMENTAL MANAGER (RSM)

- Provide direction and assistance to the Regional Manager with the development and implementation of the subcontractor review process within the local laws and customs.
- Assist PMs, when needed, in identifying qualified Subcontractors.
- Provide guidance to PMs on how to implement this procedure and qualify their Subcontractors.
- Provide assistance to the SH&E Administrator (SH&EA) in reviewing and qualifying Subcontractors as needed.
- Provide assistance to the SH&EA in discussing denials with PMs and determining a means for obtaining the services needed.

#### 4.9 ENV SH&E ADMINISTRATOR (SH&EA)

- Provide timely review of Subcontractor Safety Criteria Questionnaire (SSCQ) received.
- Provide notification of approval or denial to PMs and Purchasing Director.
- Maintain the database of approved contractors and post to web on regular basis.
- Providing annual qualification review requests to subcontractors prior to expiration.

#### 4.10 ENV EMPLOYEES

• Stop work if contractor actions present an unacceptable risk to employees, the environment, or property.



- Report contractor actions that create an unacceptable risk or violate a regulation, client rule, or safety requirement imposed by the project documents.
- Assist the PM in the performing a Post-Project Review of subcontractors used on AECOM ENV projects.

## 5.0 PROCEDURE

#### 5.4 SUBCONTRACTOR SELECTION

The Project Manager(s) (PM) who have knowledge of the work to be conducted will be responsible for selecting the appropriate Subcontractor Through the use of AECOM ENV intranet webpage dedicated to <u>Subcontractor SH&E</u> <u>Evaluation Program</u>, PMs will research eligible Subcontractors and determine if they have been approved for use by the SH&E Department, and/or if feedback on past job performance is available for review. If a Subcontractor currently exists within the system and is approved for use, available and capable of providing quality services, then it is recommended that the PM use this Subcontractor.

In the event that an approved Subcontractor cannot be found within the system, then the PM will be responsible for sending the Subcontractor(s) a Safety, Health & Environmental Qualification Form (SSCQ, Appendix B) for completion and return, or soliciting an acceptable form of feedback from the Subcontractor. At the same time the SSCQ is provided to the Subcontractor, the PM will notify their respective SH&EA by email that an SSCQ has been issued, who it was issued to, and the scope of services that the Subcontractor will provide. PMs are recommended to follow-up with the Subcontractor to verify receipt of the form and encourage submittal with all requested documentation included. When SH&E qualification is required, a Subcontractor may not be used until appropriate information has been received, reviewed, and approved by the SH&E Department.

#### 5.5 SSCQ REVIEW PROCESS

- All SSCQs will be directed to be returned to the SH&EA for review and qualification.
- The reviewer will complete a Subcontractor SSCQ Review Checklist (Appendix D) for each SSCQ.
- As part of the review and approval process, a RSM or SH&EA will identify issues related to unacceptable SH&E risks such as, but not limited to, fatalities, regulatory citations, elevated incident and/or Experience Modification Rating (EMR) or a technical clarification, and request the PM to obtain the needed information to complete the review and approve or deny the SSCQ.
- Following review of the SSCQ, or alternative feedback, the RSM or SH&EA sends the name(s) of the approved and denied Subcontractors to the PM and the Purchasing Director. The e-mail will specifically list limitations for approved Subcontractors, or state why the Subcontractor(s) is not approved.

Additionally, if a subcontractor is denied for use during an annual review, or as a result of poor job performance, the SH&EA will provide the AECOM ENV Project Manager(s) known to be using that subcontractor with a notice via email, that the subcontractor has been denied for continued use and that no further work should be granted to the subcontractor until they are once again approved. The PM's RSM will be copied on this communication.

- Hard copies of the documentation reviewed and determination of approval shall be kept on file in the SH&EA's office. Electronic images of the documentation will be made available for review by attachment to the Subcontractor's profile within the AECOM ENV database and stored locally on network servers.
- When the PM receives an e-mail detailing that a Subcontractor has been denied approval, and the denial was based on unacceptable SH&E risks identified or the lack of a submittal or a signature, it is the responsibility of the PM if directed by the RSM or SH&EA to contact the Subcontractor to obtain any missing paperwork and/or signatures.
- If the Subcontractor is not approved, the PM will be notified of the reason for denial and that an alternate Subcontractor must be retained. The review and approval process is then repeated for any new, unapproved prospective Subcontractors.
- All Subcontractor approvals will expire annually based on the date on which they were last approved.



- The SH&EA will request an update, from the Subcontractor, of all information currently on file 30-60 days prior to the scheduled approval expiration date. Annual update requests will be directed back to the SH&EA for review, approval and updating of files.
- Subcontractors who fail to update their SH&E qualifications on an annual basis will have their approval status modified to indicate expiration and PMs shall not utilize expired contractors until updated information has been submitted, reviewed and approved. PMs wishing to use an expired Subcontractor will be responsible for contacting the Subcontractor and providing them with the necessary SSCQ to complete.
- The PMs shall require all employees overseeing Subcontractors to complete the Subcontractor Post-Project SH&E Evaluation Form (Appendix E and found on the <u>Subcontractor SH&E Evaluation Program</u> intranet page). Within 7 days of completion of this evaluation, the documents shall be sent (hard copy or email) to the following:
  - a. Project Manager, for inclusion in the project file; and
  - b. SH&EA for posting to the Approved H&S Subcontractor List also found on the <u>Subcontractor SH&E</u> <u>Evaluation Program</u> intranet page.
- SSCQ approval is necessary for second tier subcontractors if they are engaged in high hazard services as determined by Corporate SH&E, Regional, or District SH&E Managers. Examples of high hazard services include, but are not limited to:
  - a. Asbestos inspection or abatement
  - b. Demolition, blasting, or other munitions related activities
  - c. Diving
  - d. Helicopter piloting/aviation
  - e. Sheet pile driving
  - f. Tank cleaning or high hazard confined space entry
  - g. Work at active railroad facilities
  - h. Work at power generation or transmission facilities
  - i. Work at refinery/petrochemical client facilities
  - j. Explosives location, removal, and management
  - k. Radiation source material containment or remediation

#### 5.6 SSCQ REVIEW CRITERIA

The basic steps for conducting an SSCQ review have been captured in a flowchart (Appendix F).

An area where the flowchart detail is minimized is the area of reviewing deficiencies noted on the SSCQ form. AECOM ENV has established a set of criteria that contractors are required to meet. Based on a review of their submittal against these criteria, contractors are approved, placed on probation or not approved.

#### 5.7 CONTRACTOR SH&E APPROVAL STATUS DATABASE

The SH&E Department will maintain a List of H&S Approved Subcontractors available on the <u>Subcontractor SH&E</u> <u>Evaluation Program</u> intranet page. Contractors are listed alphabetically within the table. Please note that those contractors whose names are in **red bold text** have failed to meet AECOM ENV SH&E criteria. Therefore, AECOM ENV project managers must not engage the services of these contractors.

 Contractors with an "Preferred" in the H/S Column of the table have successfully met, or exceeded AECOM ENV SH&E criteria and are approved for use by AECOM ENV. However, please be sure to review any nonuniversal restrictions that may be checked for an approved contractor. An example of such a restriction would include not being permitted to work within 25 feet of a railroad until appropriate training has been completed. Such a restriction would not detract from a contractor's overall approval rating, but may have specific project implications that Project Managers need to know.



- Subcontractors that have a "Qualified" status should only be used if no other Preferred subcontractors are available in a geographic area. Subcontractors with "Qualified" status should be supervised closely and given a critical post project evaluation. If a subcontractor on "Qualified" status must be used the conditions of their use must be established by the project staff and the regional or district safety manager and communicated to the subcontractor.
- Subcontractors with a "Not Recommended" status do not meet ENV SH&E qualification criteria and should not be used on a project.

#### 5.8 POST PROJECT REVIEW

AECOM ENV has developed a Post-Project Subcontractor SH&E Evaluation Form (Appendix E) available on the <u>Subcontractor SH&E Evaluation Program</u> intranet page for the project staff to complete. The form provides AECOM ENV staff an opportunity to provide comments about the contractor's SH&E commitment and conduct in the field. Project Managers and field staff are highly encouraged to complete these evaluation forms and submit them for review by the SH&E Department. These evaluation forms will be entered into the contractors file as further evidence of their ability, or inability, to execute project work in a safe manner.



## Appendix B

## Subcontractor Questionnaire

FOR AECOM ENVIRONMENT THE FOLLOWING FORM IS TO BE COMPLETED AS A SUBSTITUTE FOR ATTACHMENT 1 OF AECOM SHE SOP 303.

# THE AECOM ENVIRONMENT PROJECT MANAGER MUST COMPLETE THE FOLLOWING THREE QUESTIONS PRIOR TO SENDING THE SUBCONTRACTOR THIS FORM:

1. Name of AECOM Project Contact:

2. AECOM Office Location:

3. Client/Business Sector Subcontractor use is intended for:

#### THE AECOM ENVIRONMENT SUBCONTRACTOR IS TO PROVIDE THE FOLLOWING ADDITIONAL INFORMATION:

| Company Name:  |  |  |  |  |  |  |
|--|--|--|--|--|--|--|
| Address:   |  |  |  |  |  |  |
| City:  | State:   |  |  |  |  |  |
| Telephone:   | Fax:   |  |  |  |  |  |
| Email address:   | Number of years in business:   |  |  |  |  |  |
| Has company name changed in the last 3 years (YES/NO):<br>If YES, please provide previous operating name(s):   |  |  |  |  |  |  |
| List Service(s) to be provided:  |  |  |  |  |  |  |
| NAICS Code (SIC if NAICS not available):   |  |  |  |  |  |  |
| <ol> <li>Experience Modification Rates         <ul> <li>a) List your firm's Experience Modification Rate (EMR) for from your Workers' Compensation Insurance Carrier)</li> </ul> </li> </ol> | r the three (3) most recent years. ( <i>Information is available</i> |  |  |  |  |  |
| Year EMR Rate  | Policy Number Carrier  |  |  |  |  |  |
|  |  |  |  |  |  |  |
| Carrier Telephone: Policy Ann  | niversary Date:  |  |  |  |  |  |
| Type of Policy: Interstate Intrastate If Intrastate, please list applicable states:<br>b) If your organization does not have an EMR or your EMR is greater than 1.0, please explain why.     |  |  |  |  |  |  |
|  |  |  |  |  |  |  |



|                                      |  | Data  | Year  | Year  | Year  |
|--------------------------------------|--|---|---|---|---|
|                                      |  | Number of Lost Workday Cases  |   |   |   |
|                                      | a)   | (not days lost)   |   |   |   |
|                                      | b)   | Number of Restricted Workday Cases<br>(not restricted days)   |   |   |   |
|                                      | c)   | Number of Medical Treatment Cases*<br>(not including first aid)   |   |   |   |
|                                      | d)   | Total Recordable Cases<br>(a + b + c)   |   |   |   |
|                                      | e)   | Total Corporate Hours Worked<br>(hourly and salaried employees)   |   |   |   |
|                                      | f)   | Recordable Case Frequency Rate (RCFR)<br>([d x 200,000] / e)  |   |   |   |
|                                      | g)   | Fatalities  |   |   |   |
|                                      | h)   | Average number of employees   |   |   |   |
|                                      |  | OSHA recordable cases that resulted in DART cases   |   |   |   |
|                                      | i)   | Number DART (b) cases x 200,000 hrs. = Incidence Rate   |   |   |   |
|                                      | ''   | Number annual hours worked  |   |   |   |
|                                      |  |   |   |   |   |
| a)                                   | criter<br>etc.).<br>Does<br><b>Note</b>  | ria (i.e., prescribed medication, physical therapy - more t<br>. First aid injury treatment cases are <i>not</i> required to be a<br>s your organization have fewer than 10 employees?<br>e: If you check Yes, you are required to only complete row  | han one visit, fr<br>dded to the OSI<br>□ Yes<br>vs d) and e) in t                      | actures, imbede<br>HA Form 300 lo   | stics recordability<br>ded foreign body,<br>g.                    |
| a)<br>Lis<br>(At                     | criter<br>etc.).<br>Does<br>Note<br>st any f<br>ttach s  | ria (i.e., prescribed medication, physical therapy - more to<br>First aid injury treatment cases are <i>not</i> required to be a<br>syour organization have fewer than 10 employees?<br>If you check Yes, you are required to only complete row<br>fatalities your firm has had in the last three (3) years. In<br>supplemental information as required)  | han one visit, fr<br>dded to the OSI<br>□ Yes<br>vs d) and e) in t<br>clude location, o | actures, imbedd<br>HA Form 300 lo<br>D No<br>he above table.                    | stics recordability<br>ded foreign body,<br>g.<br>ective actions. |
| a)<br>Lis<br>(Ai                     | criter<br>etc.).<br>Does<br>Note<br>st any f<br>ttach s  | <ul> <li>considered a restricted of lost workday) as defined by ria (i.e., prescribed medication, physical therapy - more t.</li> <li>First aid injury treatment cases are <i>not</i> required to be ac s your organization have fewer than 10 employees?</li> <li>if you check Yes, you are required to only complete row fatalities your firm has had in the last three (3) years. Incomplemental information as required)</li> <li>OSHA SERIOUS, <i>REPEAT</i>, <i>WILLFUL</i>, or <i>CRIMINAL</i> cital escribe. (<i>Attach supplemental information as required</i>)</li> </ul>  | tions your firm I   | actures, imbedd<br>HA Form 300 lo<br>D No<br>he above table.<br>cause, and corr | stics recordability<br>ded foreign body,<br>g.<br>ective actions. |
| a)<br>Lis<br>(Ai<br>Lis<br>Ple<br>Do | criter<br>etc.).<br>Does<br>Note<br>st any f<br>ttach s<br><br>et any (<br>ease d<br><br>o you h<br>ves, pro | <ul> <li>A considered a restricted of lost workday) as defined by tria (i.e., prescribed medication, physical therapy - more the second second construction of the second construction construction of the second construction of the second</li></ul> | tions your firm I   | has had in the la   | stics recordability<br>ded foreign body,<br>g.<br>ective actions. |

I



| S                 | tate certifications/licenses if applicable                           |           |         |  | 🗋 `        | Yes   | 🗌 No |
|-------------------|--|-----------|---------|--|------------|-------|------|
|                   | Equipment Type (Backhoe, Skid-steer, Etc.)                           |           | Manu    | ufacturer Model Name   | Model Name |       |      |
| -                 |  | ,         |         |  |            |       |      |
| _                 |  |           |         |  |            |       |      |
|                   |  |           |         |  |            |       |      |
|                   |  |           |         |  |            |       |      |
|                   |  |           |         |  |            |       |      |
|                   | a you have an amployee training program?                             |           |         |  | ,          | Voc   |      |
| 7. D              | Does it include instructions in the following?                       |           |         |  |            | res   |      |
| -                 |  | Vos       | No      | 1  | Voc        | No    | 1    |
|                   |  | 165       | NO      |  | 165        | INU   | -    |
|                   | Company safety policy/rules  |           |         | Hot Work   |            |       | -    |
|                   | Contined Space Entry* (29 CFR<br>1910.146)                           |           |         | Decontamination Procedures   |            |       |      |
|                   | Health and Safety Plan Requirements                                  |           |         | Hazard Communication (29 CFR<br>1910.1200)? Toxic Substances                               |            |       |      |
|                   | Chemical and Physical Hazard Recognition                             |           |         | Electrical Safety/Lockout-Tagout (29<br>CFR 1910.147)                                      |            |       |      |
|                   | Emergency Response Procedures  |           |         | Safety Belts and Lifelines, Fall<br>Protection* (29 CFR 1926 Subpart M)                    |            |       |      |
|                   | Injury Reporting   |           |         | First Aid/CPR If so, how many employees  |            |       |      |
|                   | Personal Protective Equipment (29 CFR 1910.132)                      |           |         | Drum Handling  |            |       |      |
|                   | Non-injury Accident Reporting (near-<br>miss)                        |           |         | Drilling Hazards   |            |       |      |
|                   | Respiratory Protection (29 CFR<br>1910.134)/ Respiratory Fit Testing |           |         | Hearing Conservation (29 CFR 1910.95)  |            |       |      |
|                   | Portable Fire Extinguisher (29 CFR 1910,157)                         |           |         | Compressed Gas Cylinders (29 CFR<br>1910 Subpart M)  |            |       |      |
|                   | Railroad Roadway Worker Protection*<br>(49 CFR 214)                  |           |         | Trenching/Excavation (29 CFR 1926<br>Subpart P)  |            |       | -    |
|                   | Environmental Awareness Training                                     |           |         | If you provide Trenching/Excavation<br>Safety training, do you have a<br>Competent Person? |            |       |      |
| * If yo<br>reviev | u responded yes to providing training to the v.                      | marke     | d categ | ories, please provide a copy of your written   | progra     | m for | -    |
| 8. D              | oes this training comply with the OSHA HAZ                           | WOPE      | ER star | ndard at 29 CFR 1910.120(e)(3)?  | 🗋 `        | Yes   | 🗌 No |
| 9. C              | an you provide documentation of such traini                          | ng, if re | equirec | l?   | 🗋 `        | Yes   | 🗌 No |
| 10. H             | ave you developed and implemented a beha                             | avioral-  | based   | safety program?  | 🗋 `        | Yes   | 🗌 No |
|                   | If yes, which program do you implement?                              |           |         |  |            |       |      |
|                   | Loss Prevention System (LPS)   |           |         | Behavioral Safety Technologies   | (BST)      |       |      |
|                   | Safety Quality Edge  |           |         | Liberty Mutual   |            |       |      |
|                   |  |           |         |  |            |       |      |

# AECOM

| 11. Do you have a medical surveillance program as required by 29 CFR 1910.120(f)?                                    | 🗌 Yes   | 🗌 No |
|--|---------|------|
| 12. Does your company have a written Alcohol and Substance Abuse Program?  | 🗌 Yes   | 🗌 No |
| If yes, does it include the following?   |         |      |
| a. 5-panel substance testing?  | 🗌 Yes   | 🗌 No |
| <ul> <li>b. Pre-employment/pre-job assignment testing (within 30 days of pre-job assignment)?</li> <li>No</li> </ul> | 🏼 Yes   |      |
| c Post-accident drug and alcohol testing?<br>No  | 🏼 Yes   |      |
| d. Reasonable suspicion drug and alcohol testing?<br>No  | 🏼 Yes   |      |
| 13. Do you hold periodic safety meetings for your employees?   | 🗌 Yes   | 🗌 No |
| Daily 🗌 Weekly 🗌 Bi-weekly 🗌 Monthly 🗌 Less often, as neede  | ed 🗌    |      |
| 14. Does your company perform Job Hazard Analyses (JHA) for new and existing tasks?                                  | 🗌 Yes   | 🗌 No |
| If yes, please provide an example of a recently completed JHA.   |         |      |
| 15. Do you conduct field safety inspection/audits of work in progress?   | 🗌 Yes   | 🗌 No |
| a) If yes, who conducts the inspection?  |         |      |
| b) How often?  |         |      |
| 16. Do you conduct routine equipment inspections/maintenance on your vehicles  |         |      |
| including drill rigs, excavators etc.?   | 🗌 Yes   | 🗌 No |
| a) If yes, who conducts the inspection?  |         |      |
| b) How often?  |         |      |
| 17. Does your company have post accident investigation procedures?   | 🗌 Yes   | 🗌 No |
| If yes, please provide a brief description of the process.   |         |      |
| 18. Do you notify all employees of accidents and precautions related to accidents and near misses                    | ? 🗌 Yes | 🗌 No |
| How is this notification accomplished:   |         |      |
| 19. a) Safety meeting?   | 🗌 Yes   | 🗌 No |
| If yes, how soon after event?  |         |      |
| b) Written notification?   | 🗌 Yes   | 🗌 No |
| If yes, is this notification posted near the site where the incident occurred?                                       | 🗌 Yes   | 🗌 No |
| c) Are accident reports distributed to management?   | 🗌 Yes   | 🗌 No |
| To whom?   |         |      |
| How often?   |         |      |
| 20. Is safety a specific evaluation criterion in the annual performance reviews of:                                  |         |      |
| Employees?   | 🗌 Yes   | 🗌 No |
| Supervisors?   | 🗌 Yes   | 🗌 No |
| Management?  | 🗌 Yes   | 🗌 No |
|  |         |      |



| 21. Do you plan to subcontract any portion o  | f the work?                                      | Yes 🗌 No                            |  |  |  |  |  |  |  |
|---|--|-------------------------------------|--|--|--|--|--|--|--|
| If no, proceed to question 22.  |  |                                     |  |  |  |  |  |  |  |
| 21a. What portion or type of services do you plan to Subcontract?   |  |                                     |  |  |  |  |  |  |  |
| 21b. When services are subcontracted what level of screening is used to evaluate prospective subcontractors?  |  |                                     |  |  |  |  |  |  |  |
| Note – AECOM may request to review Subcontractor usage safety screening processes at any time. It is expected that AECOM Subcontractors use an appropriate level of screening to review and qualify any Sub-Subcontractors for use on AECOM projects. |  |                                     |  |  |  |  |  |  |  |
| 22. Environmental Responsiveness "Green"  | 22. Environmental Responsiveness "Green" Program |                                     |  |  |  |  |  |  |  |
| a) Is your firm ISO 14001 certifie  | d in this area?                                  | Yes No                              |  |  |  |  |  |  |  |
| b) What "green" programs has ye   | our firm initiated over the past 12 months?      | Check applicability.                |  |  |  |  |  |  |  |
| Trash recycling program   | Carpooling                                       |                                     |  |  |  |  |  |  |  |
| Paper reduction Travel re   | eductions  |                                     |  |  |  |  |  |  |  |
| Energy conservation Alte  | ernative fuels                                   |                                     |  |  |  |  |  |  |  |
| Use of environmentally friend   | y products                                       |                                     |  |  |  |  |  |  |  |
| 22 Deferences   |  |                                     |  |  |  |  |  |  |  |
| 23. References  |  | n an ide the fellowing informetion. |  |  |  |  |  |  |  |
| 24. Have you worked for AECOM previously  |  | provide the following information:  |  |  |  |  |  |  |  |
| Project Name:   | Project Manager:                                 | Date:                               |  |  |  |  |  |  |  |
|   |  |                                     |  |  |  |  |  |  |  |
|   |  |                                     |  |  |  |  |  |  |  |
|   |  |                                     |  |  |  |  |  |  |  |
|   |  |                                     |  |  |  |  |  |  |  |
|   |  |                                     |  |  |  |  |  |  |  |
| AECOM. Include name, address, and phone   | number.  | cope to those you will conduct for  |  |  |  |  |  |  |  |
| Namo 1  | 2  | 5                                   |  |  |  |  |  |  |  |
|   | 2.<br>   |                                     |  |  |  |  |  |  |  |
| Company   |  |                                     |  |  |  |  |  |  |  |
| Address   |  |                                     |  |  |  |  |  |  |  |
|   |  |                                     |  |  |  |  |  |  |  |
| Telephone   | Telephone  |                                     |  |  |  |  |  |  |  |
|   |  |                                     |  |  |  |  |  |  |  |
| 25. I have read AECOM's SH&E Policy Statement (attached) and will review it with personnel assigned to work on AECOM Projects   |  |                                     |  |  |  |  |  |  |  |
| 26. Certification   |  |                                     |  |  |  |  |  |  |  |
| The authorized individual signing below I   | nereby certifies that the above information      | is accurate.                        |  |  |  |  |  |  |  |
| Name/Title  |  |                                     |  |  |  |  |  |  |  |
| Signature   |  |                                     |  |  |  |  |  |  |  |
| Telephone   |  |                                     |  |  |  |  |  |  |  |



| The information collected on this form is required to be update<br>the assigned annual expiration date. If you prefer to rec<br>the following box and provide a valid email address whe | ed on an annual basis. AECOM will initiate this request prior to ceive requests for annual updates electronically, please check ere you may be contacted to request data. |  |  |  |
|---|---|--|--|--|
| Yes, notify me electronically. Email:   |   |  |  |  |
|   |   |  |  |  |
| List of items to be submitted with Form, checked items are rec  | quired to be submitted.   |  |  |  |
| EMR documentation from your insurance carrier   |   |  |  |  |
| OSHA 300 Logs (Past 3 years) for new Subcontractors,  | Past year for Renewal Subcontractors  |  |  |  |
| IIPP Copy (California Companies Only)   |   |  |  |  |
| Copy of additional safety policies requested in question  | 9a.   |  |  |  |
| Safety & Health Program (TABLE OF CONTENTS ONL  | _Y)   |  |  |  |
| Safety & Health Incentive Program   |   |  |  |  |
| Accident/Incident Investigation Procedure   |   |  |  |  |
| List the employees in your organization who are responsible for   | r developing/implementing your corporate SH&E program:  |  |  |  |
|   |   |  |  |  |
|   |   |  |  |  |
| Name  | Title   |  |  |  |
|   |   |  |  |  |
|   |   |  |  |  |
| Name Title  |   |  |  |  |
| Completed by Subcontractor Manager (Print Name): Completed by (Signature):  |   |  |  |  |
|   |   |  |  |  |
| Phone Number: Date Completed:   |   |  |  |  |
|   |   |  |  |  |
|   |   |  |  |  |

When this form is completed at the request of AECOM Environment, please return all forms completed and requested documentation to the following address:

Michelle Calhoun AECOM 2 Technology Park Drive Westford, MA 01886 D-978.589.3040 F-978.589.3108 email – <u>michelle.calhoun@aecom.com</u>

# Appendix C - AECOM SH&E Policy Statement

# Safety, Health and Environmental Policy Statement

#### PURPOSE

The purpose of this policy is to:

- Establish and maintain a framework for a safe and healthy workplace for all AECOM employees and minimize our impact on the environment
- Outline expectations relative to compliance with governing occupational safety, health and environmental legislation

#### COMMITMENT

AECOM is committed to protecting the safety and health of our employees and meeting our obligations with respect to the protection of others affected by our activities. We are also committed to protecting and preserving the natural environment in which we operate. We will actively seek to conserve energy, water and natural resources and to recycle and reduce waste where appropriate during the execution of our business activities. We will be good corporate citizens by striving to ensure that our facilities and operations do not pose unreasonable safety or environmental risks, and by participating in community-related activities that promote excellence in safety, health and environmental practices. In all of our activities we will develop and implement appropriate systems and procedures designed to comply with applicable laws, legislation, licensing requirements and stakeholder expectations. AECOM will plan and design its processes, facilities and projects in a manner that reduces risks and impacts during their entire life cycle, consistent with the direction and objectives of our clients.

#### **OBJECTIVES**

Our ultimate goals are simple and are derived from AECOM's Core Values:

- · Prevent work-related injuries or illnesses
- Prevent damage to property and/or equipment from our activities
- Prevent adverse impacts to the environment from our ongoing projects or operations

#### IMPLEMENTATION

Signature:

In order to guide the implementation efforts required by this policy, the Group Chief Executives, Business Line Leaders and Regional Leaders will collaborate to establish Safety, Health and Environmental (SH&E) programs that:

John M. Dionisio President and CEO

John M. Dionio

- Embrace the AECOM SH&E Guiding Principles and this policy statement
- Comply with all applicable safety, health and environmental rules and regulations at the local, state, provincial and national level
   Meet client requirements
- Meet client requirements
- Where no specific regulation exists, comply with AECOM standards and appropriate industry practices
- Report on performance relative to short- and long-term SH&E
  metrics designed to help achieve established goals
- Consult with, listen to, and respond to employees, customers and partners in order to continuously improve their SH&E performance. The establishment of formal SH&E committees, with documented charters, is recognized as an effective tool for this purpose
- Recognize those who contribute to their improved SH&E
  performance

#### AECOM EMPLOYEE RESPONSIBILITIES

All employees will be responsible for:

- Conducting themselves in accordance with directives, standards and procedures established by the applicable SH&E program
- Temporarily suspending their personal work activities and requesting guidance from their supervisor before continuing a task when they identify a condition or practice that creates a serious safety, health or environmental risk
- Immediately reporting safety, health and/or environmental incidents to their supervisor

#### POLICY REVIEW

This policy will be formally reviewed annually. However, if substantial changes occur in legislation, organization and/or other business drivers, changes may be made on an interim basis.

#### COMMUNICATION

This policy is to be displayed prominently in all permanent and temporary offices of AECOM where employee information is normally communicated. An electronic version will also be posted on the AECOM intranet.

A copy of this policy will be provided to entities working for, or on behalf of, AECOM and will also be made available to other stakeholders upon request.

Date: April 13, 2009

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AECOM



# Appendix D

|                 | SSCQ Review Checklist |
|-----------------|-----------------------|
| Subcontractor:  | Date of Review        |
| Requested User: | Office Location       |
|                 |                       |

Other

| Type of SOF: New SSCO Review | Renewal SSCO Review |
|------------------------------|---------------------|
|                              |                     |

| Client: Refinery/Petrochemical Sector <sup>1</sup> |  |
|--|--|
|--|--|

1 - Note that SQFs for Refinery/Petrochemical projects can only be reviewed by selected personnel.

| YES  | NO       | Limit/Restrictions | Review/ Limitation Guideline  |  |  |  |  |
|--|----------|--------------------|---|--|--|--|--|
| 1. Initial Check for Completeness – request missing information prior to proceeding  |          |                    |   |  |  |  |  |
|  |          |                    | All Fields completed?   |  |  |  |  |
|  |          |                    | EMR Verification Attached?  |  |  |  |  |
|  |          |                    | Past three (3) years OSHA 300 Logs attached for first time Subcontractors?<br>Previous year OSHA 300 Log attached for renewal Subcontractors?   |  |  |  |  |
|  |          |                    | Copy of written safety program for compliance with<br>Title 8 Section 3203 Illness and Injury Prevention Program? (California Work<br>Only) (If no, Limit = No California work)   |  |  |  |  |
|  |          |                    | Copy of requested safety policies, i.e. CSE, Fall Protection, etc.  |  |  |  |  |
| 2. Gen   | eral Inf | ormation           |   |  |  |  |  |
|  |          |                    | Employees greater than 11 total? Employers with <11 employees are not required to maintain OSHA 300 Log   |  |  |  |  |
| 3. Hea   | lth & Sa | afety              |   |  |  |  |  |
|  |          |                    | <ul> <li>Zero DOT, EPA, OSHA/State Citations? Confirm by reviewing:         <ul> <li>OSHA citation and violation database at <a href="http://www.osha.gov/pls/imis/establishment.html">http://www.osha.gov/pls/imis/establishment.html</a>.</li> <li>EPA Enforcement and Compliance History Online (ECHO) <a href="http://www.epa-echo.gov/echo/">http://www.epa-echo.gov/echo/</a> (If no, perform detailed review, Sullivan approval required)</li> </ul> </li> </ul> |  |  |  |  |
|  |          |                    | Interstate Worker's Comp? (If no, Limit to states covered)  |  |  |  |  |
|  |          |                    | EMR < OR = 1.0? (If EMR >1.0 or "No," request explanation from sub, perform detailed review. Sullivan approval required)  |  |  |  |  |
|  |          |                    | OSHA 300/200 log evaluation calculations verified? (If "No," request explanation from sub, perform detailed review, Sullivan approval required) Not required if <11 employees company wide.   |  |  |  |  |
|  |          |                    | OSHA Statistics (a). Zero Fatalities? (If no, request explanation from sub, perform detailed review, Sullivan approval required)  |  |  |  |  |
|  |          |                    | OSHA Statistics (g). OSHA Recordable Incident Rate less than Standard Industry Code average? <sup>2</sup>   |  |  |  |  |
|  |          |                    | OSHA Statistics (h). DART Rate less than Standard Industry Code average?  |  |  |  |  |
| <sup>2</sup> - Incident rates are number of incidents per 100 full-time employees. Use SIC code to compare to industry averages. |          |                    |   |  |  |  |  |



| 4. Regulatory Compliance Program  |   |  |  |  |  |  |  |
|---|---|--|--|--|--|--|--|
|   | All Compliance Answers = YES? (If no, set limits as appropriate in checkboxes below (e.g., limit equipment use, type of work, site area access, AECOM ENV supervision, etc.)  |  |  |  |  |  |  |
| 5. Performing Work for AECOM ENV  |   |  |  |  |  |  |  |
|   | Zero Subcontractor Usage? (If subs are to be used, Limit = Work Order to<br>require sub-subcontractor compliance with Health & Safety Article of AECOM<br>ENV Agreement along with AECOM ENV written approval of sub-<br>subcontractor.)<br>Regular, Full Time work force? (If no, Limit = AECOM ENV onsite supervision<br>required)  |  |  |  |  |  |  |
| 6. References   | requireu)   |  |  |  |  |  |  |
|   | Previous AECOM ENV Work and AECOM ENV Contact verified? (If no, Reference Check Required)   |  |  |  |  |  |  |
|   | References Checked? (Required for all new Subs)   |  |  |  |  |  |  |
|   | Check AECOM ENV Subcontractor database and SubVend for post-project evaluations completed for this sub. Overall score of all post-project evaluations 3 or greater? (If no, Sullivan approval required).  |  |  |  |  |  |  |
| Approved for use: (Check One)   | Preferred       Preferred with Restrictions         Qualified       NOT RECOMMENDED         Establish       but not related to upsafe work  |  |  |  |  |  |  |
| OSHA TRIR and/or DART greater than<br>Sub < 3 years old, AECOM ENV Super  | industry average, but less than 1.5x industry average<br>vision required with on-site mentoring/leadership  |  |  |  |  |  |  |
| If NOT RECOMMENDED, give reaso<br>Lack of Data/Program Documentation<br>Lack of required Safety Programs or Tr<br>Questionnaire incomplete or not submit<br>OSHA TRIR and/or DART too high (>1<br>Other:  | on (check all that apply):<br>Lack of EMR Verification<br>raining EMR too high or trending higher<br>tted Fatality<br>.5x industry average)   |  |  |  |  |  |  |
| Work Restrictions/Limitations (che  | ck all that apply):   |  |  |  |  |  |  |
| <ul> <li>No confined space entry</li> <li>No work requiring chemical protection</li> <li>No work requiring respirators</li> <li>No work within 25 ft of active radius AECOM Track Safety Training</li> <li>No California Work</li> <li>AECOM ENV Supervision Require</li> <li>No work other than</li> <li>No LPS Training – No Chevron Use</li> </ul> | <ul> <li>No Hot Work</li> <li>No work on HAZWOPER sites</li> <li>No work within exclusion zones</li> <li>ail without</li> <li>No LO/TO - work requiring energy isolation</li> <li>No work at heights over 6 ft</li> <li>No work with noise levels exceeding 85 dB</li> <li>No work involving compressed gas cylinders</li> <li>No excavation or trenching work</li> <li>No heavy equipment operation</li> </ul> |  |  |  |  |  |  |
| <ul> <li>Must review, acknowledge and comp</li> <li>Lack of First Aid/CPR Training, there</li> <li>Restrict to working in the following st</li> </ul>   | oly with AECOM drug & alcohol prevention programs<br>fore AECOM Supervision required<br>ates only   |  |  |  |  |  |  |
| Additional Restrictions/Limitations:  |   |  |  |  |  |  |  |
|   |   |  |  |  |  |  |  |

Date of Review



#### SUBCONTRACTOR REFERENCE CHECK:

| Subcontractor: | Reference Name/Company: |
|----------------|-------------------------|
|                |                         |

1. How many years of work experience do you have with this subcontractor?

- 2. Describe the referenced project listed by the subcontractor OR describe the most complex and/or typical project this Subcontractor preformed for your company?
- 3. Did this contractor ever have any problems in the performance of their work, and if so, how quickly were they resolved?
- 4. Describe the Subcontractor's attitude towards safety?
- 5. If asked for a reference how would you rate this subcontractor on both work performance and safety?
- 6. List one area for improvement in safety you would recommend for this subcontractor?

Reference Checked by: Date:

## Appendix E Post-Project Subcontractor SH&E Evaluation

Instructions:

- 1) Employee to fill in information in lines 5-10
- Employee to rank Subcontractor performance in Questions 1-10 by clicking on the appropriate scoring box, OVERALL SCORE WILL AUTOMATICALLY CALCULATE
- 3) Add comments based upon working experience
- 4) Submit via email as instructed below

| Overall Score:             | (Sum of ten scores) |
|----------------------------|---------------------|
| Subcontractor:             |                     |
| Subcontractor Contact:     |                     |
| Employee Completing Form:  |                     |
| Date Form Completed:       |                     |
| Name of Project:           |                     |
| Project Manager:           |                     |
| Date Field Work Completed: |                     |
|                            |                     |

|            | Unaccep  | table |   |   | Exce | xcellent |  |
|------------|--|-------|---|---|------|----------|--|
|            |  | 1     | 2 | 3 | 4    | 5        |  |
| 1)         | Has the sub arrived with appropriate PPE, tools, equipment, personnel, etc. necessary to complete the task in a safe manner? | 0     | 0 | 0 | 0    | 0        |  |
| 2)         | Was the equipment/tools brought on site in good working condition and properly maintained?                                   | 0     | 0 | 0 | 0    | 0        |  |
| 2)         | Did the such listen attention to and a satisfactor in the sufficient   |       |   |   |      |          |  |
| 3)         | meeting?   | 0     | 0 | 0 | 0    | 0        |  |
| 4)         |  |       |   |   |      |          |  |
| 4)         | Did the sub wear required PPE without reminders?   | 0     | 0 | 0 | 0    | 0        |  |
| <b>C</b> \ |  |       |   |   |      |          |  |
| 5)         | Were good housekeeping procedures followed on site?  | 0     | 0 | 0 | 0    | 0        |  |
|            |  |       |   |   |      |          |  |



- Were directions related to EHS and project tasks followed 7) without complaints?
- 8) Were tools, equipment, and work methods utilized in a safe manner?
- 9) Did the sub participate and suggest ways of improving EHS on site?
- 10) Was the sub's general behavior and attitude in keeping with ENSR's core EHS values?

## **Comments:**

| $\sim$ | $\sim$ | $\sim$ | $\sim$ | $\sim$ |
|--------|--------|--------|--------|--------|
|        |        |        |        |        |
| 0      | 0      | 0      | 0      | 0      |
|        |        |        |        |        |
| 0      | 0      | 0      | 0      | 0      |
|        |        |        |        |        |
| 0      | 0      | 0      | 0      | 0      |
|        |        |        |        | ]      |
| 0      | 0      | 0      | 0      | 0      |

## **Distribution Instructions:**

- E-mail completed form to Project Manager and Task Manager  $\square$
- E-mail to Corporate EHS Admin. (M. Calhoun/K. Ebbit) to post with SQF data
- $\Box$ Notify Subcontractor Manager of results




## Appendix F SSCQ Review Criteria Flowchart





| AECOM               |  | SH&E No.: | 305             |
|---------------------|--|-----------|-----------------|
|                     |  | Rev:      | Original        |
| Site Safety Officer |  | Data      | October 5, 2000 |
| AE                  | COM Safety, Health and Environmental Procedure | Date.     | October 5, 2009 |

## 1.0 PURPOSE

Defines the responsibilities of the Site Safety Officer (SSO) within the overall structure of a project's Safety, Health & Environmental (SH&E) support organization.

## 2.0 SCOPE

This procedure applies to all AECOM U.S.-based employees and operations.

## 3.0 DEFINITIONS

**HAZWOPER Site** – A project site where investigation, remediation cleanup, or other environmental work activities are to be planned for and conducted under the regulatory requirements of OSHA's Hazardous Waste Operations and Emergency Response (HAZWOPER) standard.

**Imminent Danger** – A condition or situation in which, if left uncorrected, could potentially result in death or serious injury. Examples include entry into a confined space without a permit, working in an excavation that is not properly shored or sloped, or working in an environment where the concentration of a contaminant exceeds its "immediate dangerous to life of health" (IDLH) level.

**Site Safety Officer (SSO)** – An AECOM employee or contract employee, designated in writing by the Project Manager (PM), with primary responsibility for implementing and monitoring applicable elements of the AECOM SH&E program at a project site in accordance with the governing Health and Safety Plan (HASP) or other project-specific document, as delineated in SH&E 302, *Risk Assessment and Hazard Analysis*. Depending on the size of the project and risk level, the Site Supervisor can also serve as the SSO if qualified. The SSO can be known by other names, including but not limited to Site Safety Coordinator (SSC), Site Safety and Health Supervisor (SSHS), and Safety and Occupational Health (SOH) Manager.

## 4.0 ROLES AND RESPONSIBILITIES

## 4.1 REGIONAL, DISTRICT, OFFICE AND DEPARTMENTAL MANAGERS

Shall ensure that PMs of projects within their areas of responsibility make prudent SSO assignments and that SH&E program implementation on projects is facilitated through the SSO in accordance with requirements of this procedure.

## 4.2 PROJECT MANAGERS (FIELD TASK MANAGERS, SUPERVISORS)

- Shall appoint a SSO in writing for applicable projects, shall ensure that all project personnel are aware of the assignment and how to contact the SSO, and shall ensure that the SSO fulfills project SH&E responsibilities in accordance with requirements outlined in Section 5.0 of this Standard Operating Procedure (SOP).
- Shall review the performance of the appointed SSO on a regular basis to ensure that he/she is maintaining effectiveness in the position.

#### 4.3 GROUP SH&E MANAGER

As required, shall provide guidance to Regional SH&E Managers and/or Operations Managers regarding the qualification and assignment of SSOs to best support the specific operational needs (e.g., support of long-duration projects having unique client interface and/or contract considerations, etc.).

## 4.4 REGIONAL SH&E MANAGER (RSM)

- Shall provide assistance to PMs and SSOs as required for carrying out the requirements of this SOP, including approving SSO assignments as appropriate.
- Shall make training materials available, help review SH&E documentation (e.g., medical surveillance information, training certificates, competent person qualifications, etc.) pertinent to personnel considered for project assignments, and provide other technical SH&E counsel to the PM and SSO as needed.

## 5.0 PROCEDURE

## 5.1 SITE SAFETY OFFICER (SSO) APPOINTMENTS

Prior to the commencement of field activities, the Project Manager will appoint a member of the field team to serve as SSO for the project. If the PM deems it necessary, an alternate SSO will be designated in the event that the primary SSO is rotated out of the project or otherwise is unable to fulfill responsibilities as the SSO.

All members of the project team will be notified of the SSO appointment. The SSO (and alternate if applicable) will be identified in the HASP.

#### 5.2 SSO QUALIFICATIONS AND SELECTION

The PM shall reference the following guidelines when appointing the SSO:

- The SSO must be able to identify SH&E risks and hazards on site. The selected individual must have a
  considerable amount of varied field experience and be familiar with company SH&E policies and
  procedures.
- The SSO on HAZWOPER sites must have up-to-date training certifications in 40-hour HAZWOPER (including annual 8-hour HAZWOPER Refresher training if applicable) and the 8-hour HAZWOPER Supervisor Course. It is recommended that SSOs be similarly trained for non-HAZWOPER project sites.
- The selected individual shall have significant field experience, be willing to accept the responsibilities of the position, and appreciate and respect those responsibilities.
- The SSO shall make SH&E hazard identification/control and SH&E compliance a priority in the field and have a high level of safety consciousness and commitment.
- The SSO shall be able to respond in a calm, controlled and organized manner in the event of an emergency.
- The SSO shall have good leadership abilities and communication skills.
- The SSO shall be willing and able to correct violations of established SH&E procedures involving AECOM employees and contract personnel. When necessary, particularly in situations involving imminent danger, the SSO shall be knowledgeable of, and willing to, issue a Stop Work order until SH&E potential violations are corrected.
- The SSO shall be able to interface with clients, emergency providers, and agency representatives as directed by the PM or Site Supervisor.

## 5.3 SSO RESPONSIBILITIES

#### 5.3.1 General

The responsibilities of the SSO will vary depending upon the complexity of the field program.

The SSO will be on site as determined in the project safety plan, and has the authority of the PM and the RSM for implementing and enforcing the HASP or other document governing AECOM's SH&E program requirements for the project.

The SSO has the authority and responsibility to take corrective action against any situations where noncompliance with the HASP or industry-accepted SH&E procedures are noted, and to issue a Stop Work order in cases where an imminent danger is perceived.

#### 5.3.2 Responsibilities - All Sites

- Intervene in behalf of safety where employees are exposed to work hazards. See SH&E SOP 101 Stop Work Authority.
- Review with the PM any client-specific SH&E requirements to be followed at the site.
- Procure and distribute personal protective equipment (PPE) needed for the project.
- Verify that PPE and safety equipment used at the site is in good condition, and that a maintenance program will be carried out by project personnel to ensure safe operation as required.
- Collect all SH&E-related documentation as required for the project, including training certificates, respirator fit-test records, material safety data sheets (MSDS), etc.
- Establish any necessary controlled work areas as designated in this HASP or other safety documentation.
- Ensure that site personnel and visitors have received the proper training and medical clearance prior to entering the site.
- Schedule and/or conduct tailgate safety meetings and maintain attendance logs and records.
- Encourage and provide a means for employees to communicate SH&E concerns to management (i.e., suggestion box, project SH&E hotline, etc.).
- Ensure that all chemicals and compressed gases brought on site are being handled and stored properly.
- Verify emergency response procedures and emergency phone numbers with site/client representatives prior to initiating work; ensure emergency evacuation routes and emergency contact and hospital/care facility information is posted; initiate emergency response procedures in accordance with HASP requirements.
- Ensure that site personnel maintain effective line-of-sight contact and voice communication in accordance with SH&E SOP 306 – *Working Alone*; ensure that effective communication equipment is available for the duration of the project so that emergency assistance can be coordinated if needed.
- Inspect the site for compliance with the governing SH&E project plan (e.g., HASP) using the appropriate inspection or audit checklist provided by the RSM or designee.
- Work with the PM to develop and implement corrective action plans to correct deficiencies discovered during site inspections. Deficiencies will be discussed with the project management to determine appropriate corrective action(s).
- Monitor the incidents on site, provide injury and incident rates to the project team and assist in developing corrective action plans.
- At the direction of the PM and/or site supervisor, initiate and conduct accident/incident investigations and prepare accident/incident investigation reports.
- Interface with the client, local emergency responders, and/or agency personnel on project issues relating to SH&E.
- Notify the client if equipment provided by the client or other site personnel, such as scaffolding, is unsatisfactory.
- Notify the PM and RSM of all potential SH&E non-compliance situations and seek advice on remediation measures, as appropriate.



## 5.3.3 Additional Responsibilities – HAZWOPER Sites

The OSHA HAZWOPER Standard requires that employers develop and implement a written safety and health program for their employees involved in hazardous waste operations. An organizational structure must be incorporated into the written program. The organizational structure establishes the specific chain of command and specifies the overall responsibilities of supervisors and employees.

The organizational structure must include a Site Safety and Health Supervisor (SSHS) to be responsible to the employer and has the authority and responsibility to implement the site safety and health plan and verify compliance with applicable SH&E requirements.

In addition to the responsibilities listed in Section 5.3.2, the SSHS will work with the PM and RSM to ensure the following requirements are met:

- Procure air monitoring instrumentation designated in the HASP.
- Perform and document worker breathing zone air monitoring required by the HASP.
- Set up and maintain the decontamination zone and ensure proper decontamination of all site personnel.
- Report any changes in site condition or the types or extent of contamination to the PM and RSM immediately.

## 6.0 REFERENCE MATERIAL

SH&E SOP 101 – Stop Work Authority

SH&E SOP 302 – Risk Assessment and Hazard Analysis

SH&E SOP 306 - Working Alone

## 7.0 ATTACHMENTS

None

## 8.0 REVISION HISTORY

| Revision   | Date            | Change |
|------------|-----------------|--------|
| Original   | October 5, 2009 | N/A    |
| Revision 1 |                 |        |

| AFCOM  |       | SH&E No.: | 307             |
|--|-------|-----------|-----------------|
|  | AECOM | Rev:      | Original        |
| Project Safety Meetings                          |       | Data      | October 5, 2000 |
| AECOM Safety, Health and Environmental Procedure |       | Date:     |                 |

## 1.0 PURPOSE

Establishes the requirements for conducting and documenting meetings on topics that are designed to promote Safety, Health & Environmental (SH&E) awareness and facilitate discussion regarding hazards and risks.

## 2.0 SCOPE

This procedure applies to all AECOM U.S.-based employees and operations.

## 3.0 DEFINITIONS

None

## 4.0 ROLES AND RESPONSIBILITIES

## 4.1 REGIONAL SH&E MANAGER

Shall provide assistance to Project Managers (PM) as required to carry out the requirements of this Standard Operating Procedure (SOP), particularly in the area of making training materials available and providing spotchecks of proper documentation.

## 4.2 REGIONAL MANAGER, DISTRICT AND OFFICE MANAGERS

Shall ensure that PMs of projects within their areas of responsibility are conducting and properly documenting safety meetings in accordance with requirements of this SOP.

## 4.3 PROJECT MANAGERS (FIELD TASK MANAGERS, SUPERVISORS)

Shall ensure that all employees and personnel under the control of AECOM (e.g., subcontractors, temporary agency employees) assigned to projects within their areas of responsibility participate in project initiation/kick-off meetings, special situation meetings, and supplemental training meetings in accordance with the requirements outlined in Section 5.0 of this procedure.

## 5.0 PROCEDURE

## 5.1 PROJECT INITIATION/KICK-OFF MEETING

Where specified in the project-specific SH&E documentation (e.g., Health and Safety Plan (HASP), Safe Work Plan, Task Hazard Analysis, etc.), a project initiation/kick-off safety meeting will be conducted prior to the start of field operations. This meeting will involve representatives from all organizations with a direct contractual relationship with AECOM on the job site. Topics for this meeting will include:

- Communication of all participants regarding on site SH&E responsibilities and authority.
- Communication of organizational SH&E performance expectations.
- Identification of significant project SH&E issues, risks, and solutions.



• Coordination of organizational SH&E conflicts and interactions.

## 5.2 SPECIAL SITUATION MEETINGS

Safety meetings will be conducted at project sites for the following operational situations:

- Project Start-up Conducted for site personnel for a new project or a new phase of work.
- Periodic Conducted at a regular, recurring frequency of not less than biweekly, but preferably once per week. Daily meetings are required for HAZWOPER activities and other activities as identified in the safety plan.
- Daily Daily safety discussions as part of daily routine project coordination meetings.
- Significant Personnel Turn-over Conducted at the start of any workday where a new organization begins work on site or when more than 25 percent of the day's work force is new to the site.
- Post-Incident Conducted at the start of the work day following the occurrence of a significant incident as defined in SH&E SOP 201 – *Incident Reporting*.
- All safety meetings listed above, with the exception of daily safety discussions not otherwise required by HAZWOPER or the project safety plan will be documented using the *Tailgate Safety Briefing Sign-In Log* (Attachment 1) or equivalent.

## 5.3 SUPPLEMENTAL TRAINING MEETINGS

#### 5.3.1 Documentation

The PM, Site Supervisor or Site Safety Officer (SSO) will implement worker training on general safety topics as part of routine on-site training activities. Where such training is conducted it will be documented on the *Safety Training Sign-In Log* (Attachment 2).

#### 5.3.2 Safety Orientation

- All project employees will attend a project-specific safety orientation and training session prior to the start of any project and/or task.
- The PM, site supervisor, or SSO will conduct the meeting based on project specifics (e.g., location, unique hazards and risks, client requirements, etc.) and any mandatory topics required by SH&E SOP 109 SH&E Training Program. The Regional SH&E Manager can provide examples of project safety orientation material for reference.
- The depth/level of training will be commensurate with the job function(s) to be performed. Site visitors will receive general orientation and task-specific training.
- At a minimum, employee orientation and training will consist of the items listed below:
  - o Identification of hazards associated with the individual's job function and responsibilities.
  - o Specific safety procedural instruction needed to perform his or her required job function or task.
  - Content of the HASP and any Job Safety Analyses (JSA)/Task Hazard Analyses (THA) in accordance with SH&E SOP 301 – *Project SH&E Planning Documentation* and SH&E SOP 302 – *Risk Assessment and Hazard Analysis.*

## 5.3.3 Periodic Safety Training Meetings

- Sit-down safety training meetings will be scheduled and conducted throughout the duration of the project.
- Meetings shall give project personnel an opportunity to maintain a high degree of safety awareness through timely and quality safety education. Meeting time will be used to discuss specific safety topics and obtain employee feedback.
- Safety meetings will be conducted by the PM, Site Supervisor or SSO and supplemented by lead persons of the various crafts represented at the site (e.g., electrician, heavy equipment operator, foreman, inspector, resident engineer, etc.).

- Topics for discussion will include SH&E hazards noted during routine and non-routine work situations and an explanation of job safety procedures unique to the project.
- The PM and SSO will monitor safety meetings to ensure that subject matter is properly presented.
- All periodic safety meetings will be documented using the *Safety Training Log* (Attachment 2). Sign-in of every meeting participant is required to ensure proper accountability and to meet AECOM project recordkeeping requirements.

## 6.0 REFERENCE MATERIAL

SH&E SOP 109 – SH&E Training Program SH&E SOP 301 – Project SH&E Planning Documentation SH&E SOP 302 – Risk Assessment and Hazard Analysis

## 7.0 ATTACHMENTS

Attachment 1 – Tailgate Safety Briefing Sign-In Log

Attachment 2 – Safety Training Sign-In Log

## **8.0 REVISION HISTORY**

| Revision   | Date            | Change |
|------------|-----------------|--------|
| Original   | October 5, 2009 | N/A    |
| Revision 1 |                 |        |

|  | Attachi  | ment 1 – Tailgate S   | afety Briefing Sign-In Lo  |  |
|--|--|---|--|--|
| Briefing Conducted By:   | Signature  |   | Date:  | Time:  |
| Project name:  | -  |   | Frolect number:  | _  |
| This sign-in log documents<br>safety briefing and ackno<br><b>applicable to the Pr</b> | s the topics of the tailgate<br>wledge their ability to a<br><b>ject</b> | safety briefing and individual attendances safety briefing and receipt of such briefi | at the briefing. Personnel who perform work operations daily. <b>Please provide a brief narrativ</b> | ons onsite are required to attend each<br>e of the following topics as |
| Scope of Work  |  |   |  |  |
| HASP/JSA/THA<br>review   |  |   |  |  |
| SOP Review   |  |   |  |  |
| PPE  |  |   |  |  |
| Requirements   |  |   |  |  |
| Incident Review<br>Safety Alerts   |  |   |  |  |
| Other:   |  |   |  |  |
|  |  | Personnel (   | ign-in List  |  |
| <b>Printed Name and</b>  | Company  | Signature   | Printed Name and Company   | Signature  |
| +.   |  |   | 7.   |  |
| 2.   |  |   | 8.   |  |
| 3.   |  |   | 9.   |  |
| 4.   |  |   | 10.  |  |
| 5.   |  |   | 11.  |  |
| 6.   |  |   | 12.  |  |
|  |  |   |  |  |

SHE 307, Attachment 1

| Iraining conducted By:         Project name:         Project name:         Project name:         This sign-in log documents the salety training sess         Additional training topics and/or rego         Safety Officer is instructed to maintain the table         Describe the elements of the table         Printed Name         1.         2.         3.         5. | Attachment 2 – Safety         signature:         signature:         repty training conducted in accordance         AECOM personnel (or contract employ sion and acknowledge receipt of such 1 | Training Sign-In Log         Ime:   | and 29 CFR 1926 as well as other<br>field/facility environments are required<br>field/facility environments are required<br>field/facility environments are required<br>field facility environments are required facility environments are required<br>field facility environments are required |
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| 5 O  |   | 12.   |  |
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| Printed Name   | Signature   | Printed Name  | Signature  |
|  | Personnel   | sign-in List  |  |
|  |   |   |  |
| Describe the elements of the the training (PPE training, Respirate   | raining topic below. Use a separate<br>ory Protection training, HAZCOM, etc.  | form for separate training. This<br>)   | form should be used for specific   |
| This sign-in log documents the sa<br>applicable regulatory requirements.<br>to attend each safety training sess<br>Additional training topics and/or reg<br>Safety Officer is instructed to mainta   | fety training conducted in accordance<br>AECOM personnel (or contract employ<br>sion and acknowledge receipt of such 1<br>gulations can be added to address ong<br>ain the completed documents at the facil   | with various Parts of 29 CFR 1910<br>ees) who perform work activities in<br>raining prior to a change in site/fac<br>bing site/facility operations. The Pro<br>ity for review for the duration of the p | and 29 CFR 1926 as well as other<br>field/facility environments are required<br>ility-specific operations or conditions.<br>ject Manager, Site supervisor, or Site<br>project.   |
| Project name:  | Project Number:   | <u> Ime:</u>  |  |
| Iraining Conducted By:   | Signature:  | Date:   |  |
|  | Attachment 2 – Safety   | Training Sign-In Lo   |  |
|  |   |   |  |

| AFCOM  |       | SH&E No.: | 502             |
|--|-------|-----------|-----------------|
|  | AECOM | Rev:      | Original        |
| Hazardous Materials and Sample Shipping          |       | Date:     | October 5, 2009 |
| AECOM Safety, Health and Environmental Procedure |       | Dale.     | October 5, 2009 |

## 1.0 PURPOSE

Prescribes the minimum requirements for shipping samples, hazardous materials (HAZMAT) and dangerous goods. It is designed to provide a framework for compliance with the requirements of the U.S. Department of Transportation (DOT) regulations published under 49 CFR and the International Air Transportation Association (IATA) regulations for shipping hazardous materials/dangerous goods by land or air.

## 2.0 SCOPE

This procedure applies to all AECOM U.S.-based employees and operations.

## 3.0 DEFINITIONS

A complete list of definitions can be found in their entirety in Department of Transportation 49 CFR <u>§171.8</u> or International Air Transport Association (IATA) regulations.

- **Carrier** A person engaged in the transportation of passengers or property by land, water, or air either as a common, contract, private carrier, or civil aircraft.
- **Dangerous goods** Articles or substances which are capable of posing a risk to health, safety, property or the environment and which are shown in the list of dangerous goods in the IATA regulations or which are classified according to IATA regulations. Generally synonymous with hazardous materials.
- **DOT** U.S. Department of Transportation.
- **Hazardous materials** A substance or material which has been determined by the U.S. Secretary of Transportation to be capable of posing an unreasonable risk to health, safety, and property when transported in commerce, and includes hazardous substances, hazardous wastes, marine pollutants, and elevated temperature materials.

Hazardous materials may include, but are not limited to: batteries, adhesives, paints, compressed gases, nuclear density meters, laboratory reagents, field samples, soil and sand siftings, hazardous wastes, and materials used for bench scale and pilot plant operations. While most environmental samples (both water and soil) do not meet the definition of hazardous material, extreme care must be taken to properly classify materials.

- **HAZMAT employee** A person who is employed by AECOM who in the course of employment directly affects hazardous materials transportation safety. This term includes employees who prepare hazardous materials for transportation, or are responsible for safety of transporting hazardous materials.
- Hazmat employer A person who uses one or more of its employees in connection with transporting hazardous materials in commerce, causing hazardous materials to be transported or shipping in commerce.
- **HMR** Hazardous Material Regulation
- IATA International Air Transport Association.
- ICAO International Civil Aviation Organization

- Materials of Trade A hazardous material, other than a hazardous waste, that is carried on a motor vehicle
  - For the purpose of protecting the health and safety of the motor vehicle operator or passengers;
  - For the purpose of supporting the operation or maintenance of a motor vehicle (including its auxiliary equipment); or
  - By a private motor carrier in direct support of a principal business that is other than transportation by motor vehicle.
- NAPL Non-aqueous phase liquid
- Offeror Any person who performs functions including selecting packaging, physical transfer of hazardous materials, classifying hazardous materials, preparing shipping papers, signing hazardous material certifications on shipping papers (as agent for), marking or placarding vehicles or packagings, or providing placards to carriers.
- Other Regulated Material (ORM) A material such as a consumer commodity which, although otherwise subject to the regulations, presents a limited hazard during transportation due to its form, quantity and packaging. It must be a material for which exceptions are provided in the DOT Section 172.101 table.
- **ORM-D** Other regulated material domestic
- Reportable Quantity (RQ) The quantity of a material listed in the DOT Section 172.101 table that must be reported.
- Serious Hazardous Materials Incident As defined in 49 CFR 171.15, anytime a material is found outside of its containment and has the potential to harm people or the environment.
- **Shipper** see Carrier

## **4.0 ROLES AND RESPONSIBILITIES**

#### 4.1 GROUP SH&E DIRECTOR

- Define the training to be required of employees involved in HAZMAT shipping and facilitate the delivery of that training.
- Coordinate information/resources for AECOM employees involved in shipping materials.
- Collect and file copies of all HAZMAT shipping papers in a central location for review by the DOT and other agencies.
- Provide resources to employees involved in shipping hazardous materials.
- Contract a 24-hour emergency response service with a telephone number that will be answered by a person either with information on the hazards of the shipment or with immediate access to such a person.
- Serve as the central point of contact for information regarding this policy and procedure.

#### 4.2 **REGIONAL SH&E MANAGERS**

- Ensure that District, Office, and Project Managers who have personnel involved in the process of
  preparing hazardous materials for shipment have appropriately trained individuals, including both office
  and field personnel.
- The Regional SH&E Manager will assign a HAZMAT shipping specialist or specialists to manage the Region's hazardous materials program.

# 4.3 PROJECT MANAGERS (INCLUDING FIELD TASK MANAGERS, SUPERVISORS) AND OFFICE MANAGERS

- Become familiar with the DOT training requirements for shipment, labeling, and packaging of hazardous materials and hazardous wastes.
- Ensure compliance and implementation of this procedure for all operations under their control. Also ensure that affected personnel have the required formal training in DOT requirements in accordance with this procedure for both field/project sites and office locations.
- File copies of all completed HAZMAT shipping papers in the project file and provide a copy to their HAZMAT Shipping Specialist.

## 4.4 HAZMAT SHIPPING SPECIALIST

- Possess working knowledge of this policy and procedure and applicable shipping requirements.
- Provide oversight of all hazardous materials shipments in the district or office in accordance with this policy and procedure, and applicable regulations.
- Assure that a copy of all completed HAZMAT shipping papers is transmitted to the Group SH&E department for filing.

#### 4.5 EMPLOYEES

- Do not handle, receive or ship samples, HAZMAT or dangerous goods without having appropriate and documented training as specified in this procedure. Note that if the employee does not think he/she would be allowed to carry the material onto a passenger aircraft, it is probably HAZMAT.
- The employee shall immediately notify the Field Task Manager or Office Manager of concerns or questions about the condition/contents of samples, HAZMAT, or dangerous goods to be shipped and/or received.

## 5.0 PROCEDURE

#### 5.1 SHIPPING

Select the best way to ship the hazardous material based on the quantity, hazard(s), and mode of transportation (e.g., air, land, water). Since more restrictive requirements apply to air shipments, ground shipment (e.g., use of a lab courier service) is encouraged for shipping dangerous goods and/or hazardous materials.

Most (if not all) package shipments (Federal Express, etc.) are transported by air. Air transportation of hazardous materials within the United States is regulated by the U.S. DOT. International air transportation of hazardous materials is regulated by IATA. AECOM will occasionally ships hazardous materials internationally (e.g., Puerto Rico is considered an international destination by Federal Express). Hazardous materials shipped in accordance with IATA's regulations are also accepted for air transportation within the United States. Therefore, to minimize confusion, AECOM employees may follow the IATA Dangerous Goods Regulations for any air transportation of hazardous materials.

Ground transportation of HAZMAT may use either DOT or IATA protocols.

Specific packaging and shipping instructions apply to all dangerous goods shipments. These instructions vary by chemical/product and are different for passenger aircraft and cargo aircraft.

Carrier-specific requirements can be obtained from the Internet or by calling the carrier's customer service line.

- The process for offering HAZMAT for shipment includes:
  - Determine the proper shipping name, hazard class, labeling requirements, and packing group.
  - Determine and comply with the proper packaging instructions.
  - Choose the proper package based on the packaging instruction and the type and quantity of material being shipped.

- Ensure package contents are compatible.
- Package, mark and label according to applicable regulations and instructions.
- Prepare shipping papers and complete the bill of lading or shipper's declaration for dangerous goods, according to applicable regulations and according to the carrier's specific requirements.
- Include on the shipping documents the shipper's certification, emergency response information and telephone number.
- Include with the shipment a copy of the applicable emergency response information with shipping papers for responders to use in emergency situations. This information includes, but is not limited to, appropriate pages from the DOT Emergency Response Guidebook (ERG) and/or Material Safety Data Sheets (MSDS).
- AECOM personnel participating in shipping HAZMAT, dangerous goods, and/or hazardous wastes are required to provide a 24-hour emergency response telephone number that must be answered by a person either with information on the hazards of the shipment or with immediate access to such a person.
- Determine the placard or placards required for the materials being offered for transportation, provide placards and affix as required.
- Notify the carrier of the proper shipping name, hazard class and total quantity of each hazardous material being offered for transportation, and make a final check for compliance with regulations and instructions before tendering the shipment to the carrier. All HAZMAT shipping papers and dangerous goods airbills must be typed.

## 5.2 TRAINING

Employees involved in shipping hazardous materials/dangerous goods (e.g., packaging, preparing paperwork, loading and/or unloading, and transporting hazardous materials) are required to have documented training prior to shipping activities. Training requirements are based on the type of materials shipped (e.g., calibration/compressed gases, laboratory reagents, field samples, hazardous wastes, etc.) and employee responsibility. Training curriculum will include function-specific, general awareness, safety and security awareness based on the two levels of expertise defined below.

## 5.2.1 Employees (Offerors)

Personnel involved in preparation of paperwork, packaging and labeling of hazardous materials shall do so *under the direction* of the AECOM HAZMAT Shipping Specialist.

## 5.2.2 HAZMAT Shipping Specialist

AECOM HAZMAT Shipping Specialist must complete a comprehensive 2-day hazardous materials/dangerous goods shipping training course to comply with applicable regulations on transporting hazardous materials by land (other than rail) and by air. Both online and conference/workshops are available through vendors like:

- Lion Technology Inc. HMT P30: Hazardous Materials Transportation Certification (49 CFR)
- JJ Keller Hazardous Materials Information Center "HAZMAT Basic Workshop"

## 5.2.3 Training Documentation

Employees are required to have documented training prior to performing activities that involve the shipment of hazardous materials/dangerous goods.

## AECOM

#### SH&E 502: Hazardous Materials and Sample Shipping

Documentation of training will be maintained by employees (certificates) and in employees' office locations. Documentation must include the following: course outline, sign-up/log-in sheet with employee name, date(s) of training, and certificate of completion from the training institute. The SH&E Department will log the training information to track compliance and refresher dates.

#### 5.3 INCIDENT REPORTING

AECOM employees who ship HAZMAT must be aware of the reporting requirements for any incident that occurs with material we have offered for shipment or that we are transporting as carriers (SH&E SOP 201 – *Incident Reporting*).

Except for transportation by aircraft, a carrier must notify DOT by telephone when any serious hazardous material incident (defined in 49 CFR 171.15) occurs during the course of loading, unloading, transportation, or temporary storage. Reports are to be made by telephone at the earliest practical moment. The nearest FAA Civil Aviation Security Office may be notified in place of the DOT if the incident involves shipment transported by aircraft.

A carrier must file a written report of the hazardous material incident in addition to telephone notification. The report must be completed using DOT's Hazardous Materials Incident Report (DOT Form F 5800.1) and submitted within 30 days of the incident's discovery to the Research and Special Programs Administration (RSPA) or the nearest FAA Civil Aviation Security Office if the incident involved transportation by aircraft.

As required by the AECOM incident reporting requirements, an initial telephone report is required whenever any of the following occurs during the course of transportation in commerce (including loading, unloading, and temporary storage) from the shipping of hazardous materials by AECOM personnel:

- As a direct result of a hazardous material:
  - A person is killed;
  - A person receives an injury requiring admittance to a hospital;
  - The general public is evacuated for one hour or more;
  - A major transportation artery or facility is closed or shut down for one hour or more; or
  - The operational flight pattern or routine of an aircraft is altered;
- Fire, breakage, spillage or suspected radioactive contamination occurs involving a radioactive material (see also the DOT regulations at 49 CFR § 176.48);
- Fire, breakage, spillage or suspected contamination occurs involving an infectious substance other than a regulated medical waste;
- A release of a marine pollutant occurs in a quantity exceeding 450 L (119 gallons) for a liquid or 400 kg (882 pounds) for a solid; or
- A situation exists of such a nature (e.g., a continuing danger to life exists at the scene of the incident) that, in the judgment of the person in possession of the hazardous material, it should be reported to the NRC even though it does not meet the criteria of paragraph (b) (1), (2), (3) or (4) of this section.

## 5.4 DRIVER TRAINING AND LICENSING

AECOM drivers who transport hazardous materials in quantities greater than 440 pounds combined total weight in any over-the-road vehicle must be trained, licensed, and designated as a Commercial Drivers License (CDL) employee in accordance with SH&E SOP 109 – *Commercial Motor Vehicle Program*.

## **6.0 REFERENCE MATERIAL**

49 CFR 171-181, HM 181 with amendments

DOT Emergency Response Guidebook (ERG2008)

International Air Transport Association (IATA), Dangerous Goods Regulations



#### SH&E 502: Hazardous Materials and Sample Shipping

International Civil Aviation Organization (ICAO), Technical Instructions for the Safe Transport of Dangerous Goods by Air, Document 9284-AN/905 as amended

International Maritime Dangerous Goods Code

United Nations, Recommendations on the Transport of Dangerous Goods, Seventh Revised Edition

DOT Pipeline and Hazardous Materials Safety Administration (PHMSA), Office of Hazardous Materials Safety (<u>http://www.phmsa.dot.gov/hazmat</u>)

Department of Transportation 49 CFR §171.8

SH&E SOP 108 – Commercial Motor Vehicles

SH&E SOP 201 – Incident Reporting

## 7.0 ATTACHMENTS

None

## **8.0 REVISION HISTORY**

| Revision   | Date            | Change |
|------------|-----------------|--------|
| Original   | October 5, 2009 | N/A    |
| Revision 1 |                 |        |

| AFCOM  |       | SH&E No.: | 608             |
|--|-------|-----------|-----------------|
|  | AECOM | Rev:      | Original        |
| Handling Drums and Large Containers              |       | Data      | October 5, 2000 |
| AECOM Safety, Health and Environmental Procedure |       | Date.     | OCIODEI 5, 2009 |

## 1.0 PURPOSE

Provides the AECOM requirements to minimize injuries, exposures, environmental contamination, and work disruptions resulting from accidents from improper handling of drums and other containers.

## 2.0 SCOPE

This procedure applies to all AECOM U.S.-based employees and operations.

## 3.0 DEFINITIONS

**Drums** – Hollow, cylindrical containers (capacity between 10-and-55-gallons) used for the storage or containerization of bulk quantities of work materials or wastes.

**Other Large Containers** – Containers other than drums that are used to hold bulk quantities of work materials or wastes. These include tanks and roll-off bins, and are generally much larger than drums.

**Tanks** – Hollow containers of capacity greater than 55 gallons used for the storage or containerization of bulk liquids.

**Roll-off Bins** – Rectangular-shaped containers capable of being transported using a specially designed vehicle on which the roll-off bin can be mounted/dismounted. Roll-off bins can be placed at a site, used to containerize bulk materials, and re-mounted on the vehicle for off-site transportation. Some roll-off bins are equipped with wheels, and can be moved manually.

## 4.0 ROLES AND RESPONSIBILITIES

## 4.1 PROJECT MANAGERS/FIELD TASK MANAGERS/SUPERVISORS

Each Project Manager/Supervisor must ensure that all aspects of this procedure are followed and adhered to on all AECOM sites and locations.

## 4.2 EMPLOYEES

• Employees shall follow this procedure.

## 5.0 PROCEDURE

These procedures apply to drums and containers of 10-gallon capacity or larger. The requirements of this procedure are not applicable to the handling of containers used to store pressurized gases or to hazardous waste drum handling.

## 5.1 GENERAL

The storage, labeling and handling of drums and other containers will conform to the following handling applicable SH&E laws and regulations, and in accordance with the applicable project-specific safety plan.



## 5.2 DRUMS

In addition to the above requirements, handling of all drums will be accomplished in accordance with the following:

- Only drums meeting U.S. Department of Transportation (DOT) specifications shall be used. Drums shall be inspected for rust, corrosion, warping, and other damage. Damaged drums shall not be used
- Drums must be stored in a manner that meets USEPA, state and local requirements
- Drums containing any materials will be covered with a tight-fitting lid when not in use
- At the conclusion of each working shift, all drums will be placed in the designated storage area appropriate to their contents. Each such area will be properly marked and secured
- Drums containing hazardous or flammable materials will be electrically grounded to prevent the buildup of static charge. As required, containers will be bonded to ensure that no potential charge difference exists between containers that might come into contact and cause sparking
- Manual lifting, carrying, or moving of drums will not be permitted. A drum-handling cart or similar apparatus will be used for moving drums from collection points to the designated storage area

## 5.3 OTHER CONTAINERS

- Each container shall be inspected for rust, corrosion, warping, and other damage prior to use. Damaged containers shall not be used
- Containers larger than 55-gallons and/or 800 pounds will not be moved using any type of manual method, including non-powered mechanical devices. All handling will be accomplished using powered mechanical equipment designed specifically for that purpose
- As applicable, any container holding material shall be covered with a tight-fitting lid when not in use
- Containers of hazardous or flammable materials will be electrically grounded to prevent the buildup of static charge. As required, containers will be bonded to ensure that no potential charge difference exists between containers that might come into contact and cause sparking

## 5.4 DRUM HANDLING PROCESS

Any movement of a drum weighing in excess of 50 pounds (or any drum of unknown weight) must be accomplished using a drum cart or other suitable mechanical means. To place a drum onto a moving device the following procedures should be used. NOTE: 1 gallons of water weighs 8.34 pounds. A 55-gallon drum half full of water would weigh 229 pounds.

## 5.4.1 Moving an upright drum

- Stand close to the drum with feet apart. One foot at the front and the other behind
- Keep knees slightly flexed
- Put your hands firmly against upper rim of the drum
- Keep arms straight with the elbows "locked"
- Rock the drum gently to get the feel of its contents before you move it
- Push the top of the drum away by extending the back leg and shifting your body weight onto your front leg
- Stop tilting the drum at the balance point. Use back leg as a counter balance
- Place the proper drum moving device under the drum before moving

## 5.4.2 Raising a drum laid on its side

- Make sure that the drum is empty before raising it
- Stand at the end of the drum



- Place one foot forward at the side of the drum, the other behind
- Bend your hips and knees
- Keep the back straight
- Grasp the rim about 6 inches from the ground while keeping your elbows inside your thighs
- Stand up by thrusting off with the back leg and continuing in an upward and forward direction.
- Bring the back leg forward as if you are walking. Keep close to the drum
- Stop at the balance point to change hand grip
- Set the drum on its base by moving the back leg forward. Use your body weight as a counter balance

## 6.0 REFERENCE MATERIAL

SH&E SOP 102 – Environmental Compliance Program SH&E SOP 607 – Manual Lifting SH&E SOP 709 – Drum, Tank, and Large Container Sampling

## 7.0 ATTACHMENTS

None

## 8.0 REVISION HISTORY

| Revision   | Date            | Change |
|------------|-----------------|--------|
| Original   | October 5, 2009 | N/A    |
| Revision 1 |                 |        |

|  | ΔΕϹΟΜ |       | 610             |
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| Hand and Power Tools                             |       | Data  | October 5, 2000 |
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## 1.0 PURPOSE

Provides the AECOM requirements for all manually-operated hand and power tools and equipment use, handling and storage.

## 2.0 SCOPE

This procedure applies to all AECOM U.S.-based employees and operations.

## 3.0 DEFINITIONS

None

## 4.0 ROLES AND RESPONSIBILITIES

## 4.1 PROJECT MANAGERS/FIELD TASK MANAGERS/SUPERVISORS

Each Manager/Supervisor must ensure that all aspects of this procedure are followed and adhered to on all AECOM sites and locations. If a specific tool is not included in this SOP, appropriate guidelines shall be established prior to work associated with that equipment, including following manufacturer's recommendations.

## 4.2 REGIONAL SH&E MANAGER

Provides technical guidance and support as to this procedure.

## 4.3 EMPLOYEES

Employees shall not work with any tool that they are not familiar with without first obtaining appropriate training on that tool.

## 5.0 PROCEDURE

## 5.1 CLEARING AND GRUBBING EQUIPMENT

In accordance with 29 CFR 1910.266, the following safety precautions will be followed during site clearing and tree felling:

## 5.1.1 Hand Tools

- All hand tools must be in safe condition. Tools must be inspected by the user daily.
- Handles must be sound, straight and tight-fitting.
- Driven tools must be dressed to remove any mushrooming.
- Cutting tools must be kept sharp and properly shaped.

- All clearing activities shall terminate during electrical storms and periods of high winds.
- Dead, broken or rotted limbs or trees (widow makers) shall be felled first.

#### 5.1.2 Machete Use

- A machete will only be used for its designated purpose; do not carelessly swing the machete when it is not needed.
- To prevent lacerations, employees will wear Kevlar gloves and Kevlar chain saw chaps.
- Machetes shall not be used when other employees are in the immediate work area.

## 5.1.3 Use of Weed Whips

Weed whips may be used to clear vegetation such as grass, light brush, briars and tree seedlings. The L-shaped weed whip cuts grass and weeds but is unstable for use on larger growth; the triangular-frame weed whip cuts briars and woody stems up to a half-inch in diameter. A "Suwannee" sling is a heavy duty weed whip that also has an axe blade. It does the same work as a weed whip, but can also cut through large materials. The heavier weight of this tool allows it to more easily cut off larger material than a weed whip.

When using weed whips, employees should follow these safety procedures:

- Select the correct tool for the types and size of vegetation present across the landfill.
- Employees will wear leather gloves when using weed whips.
- Weed whips are meant to be swung back and forth with both hands. Avoid using a golf swing. The tool should be swung no higher than an employee's side.
- Strong swings should be made to prevent the blade from bouncing or glancing off springy growth.
- Screws hold the serrated double-edge blade in place. These screws can work loose so check them before each use.
- At the end of the day, inspect the whips for damage. Clean, sharpen, and oil as necessary and store with a sheath in place.

## 5.1.4 Chain Saws

- Chain saws must be inspected daily to assure that all handles and guards are in place and tight, that all controls function properly and that the muffler is operative.
- Start the saw only on the ground or when otherwise firmly supported.
- Clear brush which might interfere with clear footing before starting to cut.
- Shut off the saw when carrying it for a distance greater than from tree to tree or when surface is slippery or heavy with underbrush. The saw must be at idle speed when carried short distances.
- Do not use the saw to cut directly overhead or a distance at which the operator no longer has a safe grip on the saw. Always use two hands to operate the saw.

 Safety glasses with permanently attached side shields will be worn underneath a steel mesh face shield which will attach to standard hard hats. The brush shield is designed to protect the head and face from debris created by using a chain saw. Employees will wear Kevlar gloves and Kevlar chain saw chaps. Appropriate ear protection must also be worn (SH&E SOP 113).

#### 5.1.5 Felling Trees Manually

- Before cutting begins, survey the work area for dead limbs, the lean of the tree to be cut, wind conditions and the location of other trees.
- Remove lodged trees (tree has not fallen to the ground after being separated from its stump) as soon as possible. Never work under a lodged tree.
- The distance between workers should be maintained at twice the height of the trees being felled.

#### 5.1.6 Chipping Operations

- Access covers and doors must not be opened until the drum or disk is at a complete stop.
- Infeed and discharge ports shall be designed to prevent employee contact with disc, knives and blower blades.

#### 5.2 CUTTING TOOLS

- Wear safety glasses and protective gloves when using cutters.
- Choose the proper cutter for the job. Cutters are designed for a specific type, hardness, and size of material.
- Inspect the tool for proper working condition.
- If tool is designed to have a guard, make sure guards are in place.
- Cut materials straight across keep the material being cut at right angles to the cutting edges of jaws.
- Warn those in the area to take precautionary measures to avoid possible injury from flying metal pieces.
- Keep cutting tools in good repair.
- Adjust and lubricate cutter and moving parts daily if heavily used.
- Sharpen jaws according to manufacturer's instructions.
- Do not use a cutting tool until you are trained in its proper and safe use.
- Do not use cushion grip handles for jobs requiring electrically-insulated handles. Cushion grips are for comfort primarily and do not protect against electric shock.
- Do not use cutters which are cracked, broken or loose.
- Do not exceed the recommended capacity of a tool.
- Do not cut diagonally.
- Do not rock cutters from side to side when cutting wire.
- Do not pry or twist with tool when cutting.
- Do not hammer on cutting tools or extend the handle length to achieve greater cutting power.



• Do not expose cutters to excessive heat.

#### 5.3 SELECTION AND USE

- Select tools that can be used without bending the wrist. Hand tools should allow the operator to grasp, hold, and use the tool with the wrist held straight.
- Select the tool with the workplace layout and job design in mind. Sometimes a tool is correct for one operation and incorrect for another.
- Use the right tool for the job. Ensure it is the right size and has sufficient power to do the job safely. When there is a choice, select a tool of a low weight.
- Select low-vibrating tools, or choose tools with vibration-absorbing handles, like those covered with cork, rubber, plastic or plastic bonded to steel, to reduce hand-arm vibration.
- Choose hand tools that have the center of gravity within or close to the handle.
- Select tools with rounded and smooth handles that you can grip easily.
- If they are available, choose hand tools with double handles to permit easier holding and better manipulation of the tool.
- Select tools with a trigger strip, rather than a trigger button. This strip will allow you to exert more force over a greater area of the hand that, in turn, will reduce muscle fatigue.
- Ensure that the trigger works easily to reduce the effort needed to operate it.
- Ensure that your tool is well maintained and in good repair.
- Frequently used tools that weigh more than 1 pound should be counter-balanced.
- Hold the tool close to the body. Do not overreach.
- Keep good balance and proper footing at all times. This will help operators to control the tool better, especially in response to unexpected situations.
- Rest your hands by putting the tool down when you are not using it.
- Reduce power to the lowest setting that can complete the job safely. This action reduces tool vibration at the source.
- Ensure that cutting tools, drill bits, etc., are kept sharp, clean, and well maintained.
- Do not wear gloves, loose clothing or jewelry while using revolving power tools. Tie back long hair or wear appropriate hair protection to prevent hair from getting caught in moving parts of equipment (manufacturer's operating manual for recommended PPE and/or safety issues/concerns).
- Do not use a tool unless you have been trained to use it safely and know its limitations and hazards.

## 5.4 STORAGE AND HANDLING

- All tools shall be stored in a manner to prevent damage and injury. Store tools in a dry, secure location when they are not being used.
- Tools shall be properly put away after use.
- Sharp or pointed tools shall be handled only if the sharp/pointed edge is covered, carried in a tool box or other device designed for that purpose, or the sharp/pointed edge is pointed downward, away from the body.

## 5.5 ELECTRIC TOOLS

All electrical tools and equipment must be operated in accordance with the requirements of SH&E SOP 601 – *General Electrical Safety.* 



## 5.5.1 Inspection

- Inspect tools for any damage prior to each use.
- Ensure that the power tool has the correct guard, shield or other attachment that the manufacturer recommends.
- Ensure that the tools are properly grounded using a 3-prong plug, are double-insulated (and are labeled as such), or are powered by a low-voltage isolation transformer; this will protect users from an electrical shock.
- Check electric tools to ensure that a tool with a 3-prong plug has an approved 3-wire cord and is grounded. The 3-prong plug should be plugged in a properly grounded 3-pole outlet. If an adapter must be used to accommodate a 2-hole receptacle, the adapter wire must be attached to a known, functioning ground. Never remove the third, grounding prong from a plug.
- Check the handle and body casing of the tool for cracks or other damage.
- If the tool has auxiliary or double handles, check to see that they installed securely.
- Inspect cords for defects: check the power cord for cracking, fraying, and other signs of wear or faults in the cord insulation.
- Any tool with a spring-operated trigger switch shall be fully functional.
- Check for damaged switches and ones with faulty trigger locks.
- Inspect the plug for cracks and for missing, loose or faulty prongs.
- If a tool is defective, remove it from service, and tag it clearly "Out of service for repair." Replace damaged equipment immediately – do not use defective tools "temporarily." DO NOT ATTEMPT FIELD REPAIRS.

#### 5.5.2 Battery Powered Tools

- Use only the kind of battery that the tool manufacturer specifies for the battery-powered tool that you are using.
- Recharge a battery-powered tool only with a charger that is specifically intended for the battery in that tool.
- Remove the battery from the tool or ensure that the tool is switched off or locked off before changing accessories, making adjustments, or storing the tool.
- Store a battery pack safely so that no metal parts, nails, screws, wrenches and so on can come in contact with the battery terminals; this could result in shorting the battery and possibly cause sparks, fires or burns

## 5.5.3 Using Electric Tools

- Switch off the tools before connecting them to a power supply.
- If a power cord feels more than comfortably warm or if a tool is sparking excessively, have it checked by an electrician or other qualified person.
- Disconnect the power supply before making adjustments or changing accessories.
- Remove any wrenches and adjusting tools before turning on a tool.
- Inspect the cord for fraying or damage before each use. Tag defective tools clearly with an "Out of service" tag and replace immediately with a tool in good running order.
- During use, keep power cords clear of tools and the path that the tool will take.
- Use clamps, a vice or other devices to hold and support the piece being worked on, when practical to do so. This will allow you to use both hands for better control of the tool and will help prevent injuries if a tool jams or binds in a work piece.



- Use only approved extension cords that have the proper wire size for the length of cord and power requirements of the electric tool that you are using. This will prevent the cord from overheating.
- For outdoor work, use outdoor extension cords marked "W-A" or "W."
- Suspend power cords over aisles or work areas to eliminate stumbling or tripping hazards.
- Eliminate octopus connections: if more than one receptacle plug is needed, use a power bar or power distribution strip that has an integral power cord and a built-in overcurrent protection.
- Pull the plug not the cord when unplugging a tool. Pulling the cord causes wear and may adversely affect the wiring to the plug an electrical shock to the operator may result.
- Keep power cords away from heat, water, oil, sharp edges and moving parts. They can damage the insulation and cause a shock.
- Avoid accidental starting by ensuring the tool is turned off before you plug it in. Also do not walk around with a plugged-in tool with your finger touching the switch.
- Do not bypass the ON/OFF switch and operate the tools by connecting and disconnecting the power cord.
- Do not disconnect the power supply of the tool by pulling or jerking the cord from the outlet.
- Do not leave a running tool unattended. Do not leave it until it has been turned off, has stopped running completely, and has been unplugged.
- Do not use electric tools in wet conditions or damp locations unless tool is connected to a ground fault circuit interrupter (GFCI).
- Do not expose electric power tools to rain or wet conditions; wet tools increase the likelihood for getting an electric shock.
- Avoid body contact with grounded surfaces like refrigerators, pipes and radiators when using electric powered tools; this will reduce the likelihood of shock if the operator's body is grounded.
- Do not plug several power cords into one outlet by using single-to-multiple outlet adapters or converters ("cube taps").
- Do not use light duty power cords.
- Do not connect or splice extension cords together to make a longer connection: the resulting extension cord may not be able to provide sufficient current or power safely.
- Do not carry electrical tools by the power cord.
- Do not tie power cords in knots. Knots can cause short circuits and shocks. Loop the cords or use a twist lock plug.
- Never break off the third prong on a plug: replace broken 3-prong plugs and make sure the third prong is
  properly grounded.
- Never use extension cords as permanent wiring; use extension cords only as a temporary power supply to an area that does not have a power outlet.
- Do not walk on or allow vehicles or other moving equipment to pass over unprotected power cords. Cords should be put in conduits or protected by placing planks on each side of them.
- Do not brush away sawdust, shavings or turnings while the tool is running. Never use compressed air for cleaning surfaces or removing sawdust, metal turnings, etc.
- Do not operate tools in an area containing explosive vapors or gases.
- Do not clean tools with flammable or toxic solvents.
- Do not surprise or touch anyone who is operating a tool. Startling a tool operator could end up causing an accident or injury.

## 5.5.4 Belt Sanders

- Wear safety glasses.
- Make sure the sander is switched "OFF" before connecting the power supply.
- Disconnect power supply before changing a sanding belt, making adjustments, or emptying dust collector.
- Inspect sanding belts before using them. Replace those belts that are worn or frayed.
- Install sanding belts that are the same widths as the pulley drum.
- Adjust sanding belt tension to keep the belt running true and at the same speed as pulley drum.
- Secure the sanding belt in the direction shown on the belt and the machine.
- Keep hands away from a sanding belt.
- Use two hands to operate sanders one on a trigger switch and the other on a front handle knob.
- Keep all cords clear of sanding area during use.
- Clean dust from a motor and vents at regular intervals.
- Do not use a sander without an exhaust system or a dust collector present that is in good working order. Empty the collector when 1/4 full. The dust created when sanding can be a fire and explosion hazard. Proper ventilation is essential.
- Do not exert excessive pressure on a moving sander. The weight of the sander supplies adequate pressure for the job.
- Do not work on unsecured stock unless it is heavy enough to stay in place. Clamp the stock into place or use a "stop block" to prevent movement.
- Do not overreach. Always keep proper footing and balance.
- Do not cover the air vents of the sander.

## 5.5.5 Drills

- Wear safety glasses.
- Keep drill air vents clear to maintain adequate ventilation.
- Keep drill bits sharp always.
- Keep all cords clear of the cutting area during use. Inspect for frays or damage before each use.
- Disconnect power supply before changing or adjusting bit or attachments.
- Tighten the chuck securely. Remove chuck key before starting drill.
- Secure workpiece being drilled to prevent movement.
- Slow the rate of feed just before breaking through the surface.
- Drill a small "pilot" hole before drilling large holes.
- For small pieces, clamp stock so work will not twist or spin. Do not drill with one hand while holding the material with the other.
- Do not use a bent drill bit.
- Do not exceed the manufacturer's recommended maximum drilling capacities.
- Do not use a hole saw cutter without the pilot drill.
- Do not use high speed steel (HSS) bits without cooling or using lubrication.
- Do not attempt to free a jammed bit by starting and stopping the drill. Unplug the drill and then remove the bit from the work piece.

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- Do not reach under or around stock being drilled.
- Do not overreach. Always keep proper footing and balance.
- Do not raise or lower the drill by its power cord.

## 5.5.6 Planers

- Wear safety glasses.
- Disconnect the planer from the power supply before making any adjustments to the cutter head or blades.
- Use blades of the same weight and set at the same height.
- Ensure that the blade-locking screws are tight.
- Remove adjusting keys and wrenches before turning on power.
- Support the material (stock) in a comfortable position that will allow the job to be done safely and accurately.
- Check stock thoroughly for staples, nails, screws, or other foreign objects before using a planer.
- Start a cut with the infeed table (front shoe) resting firmly on the stock and with the cutter head slightly behind the edge of the stock.
- Use two hands to operate a planer one hand on the trigger switch and the other on a front handle.
- Do not put your finger or any object in a deflector to clean out chips while a planer is running.
- Disconnect the power supply when stopping to dump out chips.
- Do not set a planer down until blades have stopped turning.
- Keep all cords clear of cutting area.

## 5.5.7 Routers

- Wear safety glasses.
- Disconnect the power supply before making any adjustments or changing bits.
- Ensure that the bit is securely mounted in the chuck and the base is tight.
- Put the base of the router on the work, template or guide. Make sure that the bit can rotate freely before switching on the motor.
- Secure stock. Never rely on yourself or a second person to support or hold the material. Sudden torque or kickback from the router can cause damage and injury.
- Before using a router, check stock thoroughly for staples, nails, screws or other foreign objects.
- Keep all cords clear of cutting area.
- Hold both hands on router handles always, until a motor has stopped. Do not set the router down until the exposed router bit has stopped turning.
- Do not overreach. Keep proper footing and balance.
- When inside routing, start the motor with the bit above the stock. When the router reaches full power, lower the bit to two times the required depth.
- When routing outside edges, guide the router counter clockwise around the work.
- When routing bevels, moldings and other edge work, make sure the router bit is in contact with the stock to the left of a starting point and is pointed in the correct cutting direction.
- Feed the router bit into the material at a firm, controlled speed.
- With softwood, you can sometimes move the router as fast as it can go. With hardwood, knotty and twisted wood, or with larger bits, cutting may be very slow.

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- The sound of the motor can indicate safe cutting speeds. When the router is fed into the material too slowly, the motor makes a high-pitched whine. When the router is pushed too hard, the motor makes a low growling noise.
- When the type of wood or size of the bit requires going slow, make two or more passes to prevent the router from burning out or kicking back.
- To decide the depth of cut and how many passes to make, test the router on scrap lumber similar to the work.

## 5.5.8 Circular Saws

- Wear safety glasses and hearing protection.
- Check the retracting lower blade guard to make certain it works freely.
- Ensure that the blade that you have selected is sharp enough to do the job. Sharp blades work better and are safer.
- Check the saw for proper blade rotation.
- Set the depth of the blade, while the saw is unplugged, and lock it at a depth so that the lowest tooth does not extend more than about 1/8 inch beneath the wood.
- Keep all cords clear of cutting area.
- Circular saws are designed for right-hand operation; left-handed operation will demand more care to operate safely.
- Check the retracting lower blade guard frequently to make certain it works freely. It should enclose the teeth as completely as possible, and cover the unused portion of the blade when cutting.
- Check that the retracting lower blade guard has returned to its starting position before laying down the saw.
- Keep upper and retracting lower blade guard clean and free of sawdust.
- Disconnect power supply before adjusting or changing the blade.
- Allow the saw to reach full power before starting to cut.
- Use two hands to operate saws one on a trigger switch and the other on a front knob handle.
- Keep the motor free from accumulation of dust and chips.
- Select the correct blade for stock being cut and allow it to cut steadily. Do not force it.
- Secure work being cut to avoid movement.
- Do not hold or force the retracting lower guard in the open position.
- Do not place your hand under the shoe or guard of the saw.
- Do not over tighten the blade-locking nut.
- Do not twist the saw to change, cut or check alignment.
- Do not use a saw that vibrates or appears unsafe in any way.
- Do not force the saw during cutting.
- Do not cut materials without first checking for obstructions or other objects such as nails and screws.
- Do not carry the saw with a finger on the trigger switch.
- Do not overreach. Keep proper footing and balance.
- Do not rip stock without using a wedge or guide clamped or nailed to the stock.

## 5.5.9 Other Saws

- Wear safety glasses.
- Disconnect power supply before changing or adjusting blades.
- Use lubricants when cutting metals.
- Keep all cords clear of cutting area.
- Position the saw beside the material before cutting and avoid entering the cut with a moving blade.
- Make sure guards, if present, are installed and are working properly.
- Remember sabre saws cut on the upstroke.
- Secure and support stock as close as possible to the cutting line to avoid vibration.
- Keeps the base or shoe of the saw in firm contact with the stock being cut.
- Select the correct blade for the material being cut and allow it to cut steadily. Do not force it. Clean and sharp blades operate best.
- Set the blade to go no further than 1/8 to 1/4 inch deeper than the material being cut.
- Do not start cutting until the saw reaches its full power.
- Do not force a saw along or around a curve. Allow the machine to turn with ease.
- Do not insert a blade into or withdraw a blade from a cut or lead hole while the blade is moving.
- Do not put down a saw until the motor has stopped.
- Do not reach under or around the stock being cut.
- Maintain control of the saw always. Avoid cutting above shoulder height.
- External Cuts:
  - Make sure that the blade is not in contact with the material or the saw will stall when the motor starts.
  - Hold the saw firmly down against the material and switch the saw on.
  - Feed the blade slowly into the stock, maintaining an even forward pressure.
- Internal Cuts:
  - Drill a lead hole slightly larger than the saw blade. With the saw switched off, insert the blade in the hole until the shoe rests firmly on the stock.
  - Do not let the blade touch the stock until the saw has been switched on.

## 5.6 PNEUMATIC TOOLS

## 5.6.1 General Requirements

- Wear safety glasses.
- Ensure that the compressed air supplied to the tool is clean and dry. Dust, moisture, and corrosive fumes can damage a tool. An in-line regulator filter and lubricator increases tool life.
- Keep tools clean and lubricated, and maintain them according to the manufacturers' instructions.
- Use only the attachments that the manufacturer recommends for the tools you are using.
- Be careful to prevent hands, feet, or body from injury in case the machine slips or the tool breaks.
- Reduce physical fatigue by supporting heavy tools with a counter-balance wherever possible.
- Use the proper hose and fittings of the correct diameter.
- Use hoses specifically designed to resist abrasion, cutting, crushing and failure from continuous flexing.

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- Choose air-supply hoses that have a minimum working pressure rating of 150 psig or 150% of the maximum pressure produced in the system, whichever is higher.
- Check hoses regularly for cuts, bulges and abrasions. Tag and replace, if defective.
- Blow out the air line before connecting a tool. Hold hose firmly and blow away from yourself and others.
- Make sure that hose connections fit properly and are equipped with a mechanical means of securing the connection (e.g., chain, wire, or positive locking device).
- Install quick disconnects of a pressure-release type rather than a disengagement type. Attach the male end of the connector to the tool, NOT the hose.
- Do not operate the tool at a pressure above the manufacturer's rating.
- Turn off the air pressure to the hose when not in use or when changing power tools.
- Do not carry a pneumatic tool by its hose.
- Avoid creating trip hazards caused by hoses laid across walkways or curled underfoot.
- Do not use compressed air to blow debris or to clean dirt from clothes.

#### 5.6.2 Pneumatic Nailing and Stapling Tools

- Permit only experienced and trained persons to operate pneumatic nailing and stapling tools.
- Wear safety glasses or face a shield and, where necessary, use hearing protection.
- Inspect a tool before connecting it to air supply:
- Check tool safety mechanisms if applicable.
- Tighten securely all screws and cylinder caps.
- Check correct air supply and pressure before connecting a tool.
- Check that the tool is correctly and securely connected to the air supply hose and that it is in good working order, with the safety mechanism operative, before using.
- Always handle a tool as if it loaded with fasteners (nails, staples, etc.).
- Equip tools with a work-contacting element that limits the contact area to one that is as small as practical.
- Make sure that the mechanical linkage between the work-contacting element and trigger is enclosed.
- Disconnect a tool from the air supply when the tool is unattended and during cleaning or adjustment. Before clearing a blockage, be sure that depressing the trigger exhausts all air from the tool.
- Use only fasteners recommended by the manufacturer.
- Permit only properly trained people to carry out tool maintenance.
- Do not operate at a pressure above the manufacturers' rating.
- Do not depress the trigger unless the nosepiece of tool is directed onto a safe work surface.
- Do not carry a tool with the trigger depressed.
- Do not load a tool with fasteners while the trigger is depressed.
- Do not overreach. Keep proper footing and balance.
- Do not use compressed air to blow debris or to clean dirt from clothes.



## 5.7 MANUAL HAND TOOLS

#### 5.7.1 Hammers

- Hammers are designed according to the intended purpose. Select a hammer that is comfortable for you and that is the proper size and weight for the job. Misuse can cause the striking face to chip, possibly causing a serious injury.
- Choose a hammer with a striking face diameter approximately ½ inch larger than the face of the tool being struck (e.g., chisels, punches, wedges, etc.).
- Ensure that the head of the hammer is firmly attached to the handle.
- Replace loose, cracked or splintered handles.
- Discard any hammer with mushroomed or chipped face or with cracks in the claw or eye sections.
- Strike a hammer blow squarely with the striking face parallel to the surface being struck. Always avoid glancing blows and over and under strikes. (Hammers with beveled faces are less likely to chip or spall).
- Look behind and above you before swinging the hammer.
- Watch the object you are hitting.
- Hold the hammer with your wrist straight and your hand firmly wrapped around the handle.
- Do not use a hammer with a loose or damaged handle.
- Do not use handles that are rough, cracked, broken, splintered, sharp-edged or loosely attached to the head.
- Do not use any hammer head with dents, cracks, chips, mushrooming, or excessive wear.
- Do not use a hammer for any purpose for which it was not designed or intended.
- Do not use one hammer to strike another hammer, other hard metal objects, stones or concrete.
- Do not redress, grind, weld or reheat-treat a hammer head.
- Do not strike with the side or cheek of the hammer.

## 5.7.2 Pipe Tools (Wrenches, Cutters, Reamers, and Threaders)

- Pipe tools are made in various shapes and sizes and for many uses. Always use the correct tool for the job.
- Select a pipe wrench with sufficient capacity and leverage to do the job.
- Use a pipe wrench to turn or hold a pipe. Never use a pipe wrench to bend, raise or lift a pipe.
- Adjust the pipe wrench grip to maintain a gap between the back of the hook jaw and the pipe. This concentrates the pressure at the jaw teeth, producing the maximum gripping force. It also aids the ratcheting action.
- Inspect pipe wrenches periodically for worn or unsafe parts and replace them (e.g., check for worn threads on the adjustment ring and movable jaw).
- Keep pipe wrench teeth clean and sharp.
- Face a pipe wrench forward. Turn wrench so pressure is against heel jaw.
- Pull, rather than push on the pipe wrench handle. Maintain a proper stance with feet firmly placed to hold your balance.
- Do not use a pipe wrench as a hammer, or strike a pipe wrench with a hammer.
- Do not use pipe wrenches on nuts and bolts.
- Do not use a pipe extender for extra leverage. Get a larger pipe wrench.
- Replace pipe cutter wheels which are nicked or otherwise damaged.

- Use a 3- or 4-wheeled cutter, if there is not enough space to swing the single wheel pipe cutter completely around the pipe.
- Choose a cutting wheel suitable for cutting the type of pipe material required:
  - Thin wheel for cutting ordinary steel pipe.
  - Stout wheel for cutting cast iron.
  - Other wheels for cutting stainless steel, plastic and other materials.
- Select the proper hole diameter and correct tap size to tap a hole. The hole should be sized so that the thread cut by the tap will be about 75% as deep as the thread on the tap.
- Use a proper tap wrench (with a "T" handle) for turning a tap.
- Use lubricant or machine cutting fluid with metals other than cast iron.
- Do not permit chips to clog flutes (groves in the tap that allow metal chips to escape from the hole). The chips may prevent the tap from turning this may result in the tap breaking if you continue to apply pressure.
- Do not use a conventional adjustable wrench for turning a tap it will cause uneven pressure on the tap that may cause it to break.
- Do not attempt to thread hardened steel. This can chip or damage the die.
- Do not thread any rod or other cylindrical object that is larger in diameter than the major diameter of the die thread.
- Do not use a spiral reamer on a rotating pipe. The reamer may snag and cause serious injury.

#### 5.7.3 Pliers and Wire Cutters

- Pliers are made in various shapes and sizes and for many uses. Use the correct pliers or wire cutters for the job.
- Choose pliers or wire cutters that have a grip span of  $2\frac{1}{2} 3\frac{1}{2}$  inches to prevent your palm or fingers from being pinched when the tools are closed.
- Use adjustable pliers that allow you to grip the work piece firmly while maintaining a comfortable handgrip (i.e., hand grasp is not too wide).
- Use tools only if they are in good condition.
- Make sure that the cutting edges are sharp. Dull and worn-down cutting edges require many times more force for cutting.
- Make sure that the toothed jaws are clean and sharp. Greasy or worn-down jaws can result in compromised safety. Such tools also require increased force to hold the work piece which, in turn, increases the risk of muscular fatigue and repetitive strain injuries.
- Oil pliers and wire cutters regularly. A drop of oil on the hinge will make the tools easier to use.
- Pull on the pliers; do not push away from you when applying pressure. If the tool slips unexpectedly, you may lose your balance or injure your hand.
- Cut at right angles. Never rock the cutting tool from side to side or bend wire back and forth against the cutting edges.
- Do not cut hardened wire unless the pliers or wire cutters are specifically manufactured for this purpose.
- Do not expose pliers or wire cutters to excessive heat.
- Do not bend stiff wire with light pliers. Needle-nose pliers can be damaged by using the tips to bend large wire. Use a sturdier tool.
- Do not use pliers as a hammer.

- Do not hammer on pliers or wire cutters to cut wires or bolts.
- Do not extend the length of handles to gain greater leverage. Use a larger pair of pliers for gripping or a bolt cutter for cutting.
- Do not use cushion grip handles for jobs requiring tools with electrically-insulated handles. Cushion grips are for comfort primarily and do not protect against electric shock.
- Do not use pliers on nuts and bolts; use a wrench.

## 5.7.4 Screwdrivers

- Screwdrivers are made in various shapes and sizes and for many uses. Use the correct screwdriver for the job.
- Choose contoured handles that fit the shank tightly, with a flange to keep the hand from slipping off the tool.
- Use a slot screwdriver with a blade tip width that is the same as the width of the slotted screw head.
- For cross-head screws, use the correct size and type of screwdriver; a Phillips screwdriver may slip out of a screw head designed for use with the slightly flatter-tipped Pozi-driv screwdriver.
- Use a vise or clamp to hold the stock if the piece is small or moves easily.
- Keep the screwdriver handle clean. A greasy handle could cause an injury or damage from unexpected slippage.
- If work must be carried out on "live" electrical equipment, use screwdrivers that have insulated handles designed for electrical work and a non-conducting shaft. Remember, most plastic handles are designed for grip and comfort.
- Use non-magnetic tools when working near strong magnets (e.g., in some laboratories).
- Use a screw-holding screwdriver (with screw-holding clips or magnetic blades) to get screws started in awkward, hard-to-reach areas. Square-tipped screwdrivers (e.g., Robertson) that hold screws with recessed square holes are also useful in such situations.
- Use an offset screwdriver in close quarters where a conventional screwdriver cannot be used.
- Use a screwdriver that incorporates the following features when continuous work is needed:
  - A pistol grip to provide for a straighter wrist and better leverage.
  - A "Yankee drill" mechanism (spiral ratchet screwdriver or push screwdriver) which rotates the blade when the tool is pushed forward.
  - A ratchet device to drive hard-to-move screws efficiently, or use a powered screwdriver.
- File a rounded tip square making sure the edges are straight. A dull or rounded tip can slip out of the slot and cause hand injury or damage to materials.
- Store screwdrivers in a rack or partitioned pouch so that the proper screwdriver can be selected quickly.
- Do not lean or push on a screwdriver with any more force than necessary to keep contact with the screw. A screw properly piloted and fitted will draw itself into the right position when turned. Keep the shank directly over the screw being driven.
- Do not hold the stock in one hand while using the screwdriver with the other. If the screwdriver slips out of the slot you may cut your hand.
- Do not hammer screws that cannot be turned.
- Do not grind the tip to fit another size screw head.
- Do not try to use screwdrivers on screw heads for which they are not designed (e.g., straight blade screwdrivers on Phillips, clutch head, Torx or multi-flutted spline screw heads).

- Do not use defective screwdrivers (e.g., ones with rounded or damaged edges or tips; split or broken handles; or bent shafts).
- Do not use a screwdriver for prying, punching, chiseling, scoring, scraping or stirring paint.
- Do not use pliers on the handle of a screwdriver for extra turning power. A wrench should be used only on the square screwdriver shank designed for that purpose.
- Do not expose a screwdriver blade to excessive heat. Heat can affect the temper of the metal and weaken the tool.
- Do not use a screwdriver to check if an electrical circuit is live. Use a suitable meter or other circuit testing device.
- Do not carry screwdrivers in your pockets.

#### 5.7.5 Snips

- Wear safety glasses and protective gloves when working with snips. Small pieces of metal may go flying in the air and cut edges of metal are sharp.
- Snips are made in various shapes and sizes for various tasks. The handle can be like those on scissors
  with finger and thumb holes or like plier handles. Models are available for cutting in straight lines and in
  curves to the left or right.
- Universal snips can cut in both straight and wide curves.
- Straight snips and duckbill snips (flat blade, "perpendicular" to the handle, with pointed tips) are generally designed to cut in straight lines; some duckbill snips are designed for cutting curved lines.
- Hawk's bill snips (with crescent-shaped jaws) are used for cutting tight circles.
- Aviation snips have compound leverage that reduces the effort required for cutting.
- Offset snips have jaws that are set at an angle from the handle.
- Select the right size and type of snips for the job; check the manufacturer's specifications about the intended use of the snips (e.g., type of cut straight, wide curve, tight curve, right or left, and maximum thickness and kind of metal or other material that can be cut).
- Use only snips that are sharp and in good condition.
- Use snips for cutting soft metal only. Hard or hardened metal should be cut with tools designed for that purpose.
- Use ordinary hand pressure for cutting. If extra force is needed, use a larger tool.
- Cut so that the waste is on the right if you are right-handed or on the left if you are left-handed.
- Avoid springing the blades. This results from trying to cut metal that is too thick or heavy for the snips you are using.
- Keep the nut and the pivot bolt properly adjusted at all times.
- Oil the pivot bolt on the snips occasionally.
- Do not try to cut sharp curves with straight cut snips.
- Do not cut sheet metal thicker than the manufacturer's recommended upper limit (e.g., cuts up to 16gauge cold, rolled steel or 18-gauge stainless steel). Do not extend the length of handles to gain greater leverage.
- Do not hammer or use your foot to exert extra pressure on the cutting edges.
- Do not use cushion grip handles for tasks requiring insulated handles. They are for comfort primarily and not for protection against electric shocks.
- Do not attempt to re-sharpen snips in a sharpening device designed for scissors, garden tools, or cutlery.



- Wear safety glasses.
- Wood chisels are made in various shapes and sizes and for many uses. Use the correct chisel for the job.
- Use the right size of chisel for the job.
- Choose smooth, rectangular handles that have no sharp edges and are attached firmly to the chisel.
- Ensure that the cutting edge is sharp. Dull chisels can be difficult to control and require more effort to do the job.
- Check stock thoroughly for knots, staples, nails, screws, or other foreign objects before chiseling.
- Clamp stock so it cannot move.
- Adjust your stance so that you do not lose your balance if the tool slips.
- Chip or cut away from yourself.
- Keep your hands and body behind the cutting edge.
- Use a wooden or plastic mallet with a large striking face on all chisels. Only heavy-duty or framing chisels are made of a solid or molded handle that can be struck with a steel hammer.
- Make finishing or paring cuts with hand pressure alone.
- Place chisels safely within the plastic protective caps to cover cutting edges when not in use.
- Replace any chisel that is bent or shows dents, cracks, chips, or excessive wear.
- Store chisels in a "storage roll," a cloth or plastic bag with slots for each chisel, and keep them in a drawer or tray.
- Replace broken or splintered handles.
- Sharpen cutting edges as often as necessary.
- Do not use a wood chisel as a pry or a wedge.
- Do not use a wood chisel on metal.
- Do not use an all-steel chisel with a mushroomed face or a chipped edge. Redress with a file or whetstone.
- Do not use a grinder to redress heat-treated tools. Use a whetstone.
- Do not use a dull chisel.

## 5.7.7 Wrenches

- Use the correct wrench for the job pipe wrenches for pipes and plumbing fittings, and general-use wrenches for nuts and bolts.
- Discard any damaged wrenches (e.g., open-ended wrenches with spread jaws or box wrenches with broken or damaged points).
- Select the correct jaw size to avoid slippage.
- Position your body in a way that will prevent you from losing balance and hurting yourself if the wrench slips or something (e.g., a bolt) suddenly breaks.
- Use a box or socket wrench with a straight handle, rather than an off-set handle, when possible.
- Ensure that the jaw of an open-ended wrench is in full contact (fully seated, "flat," not tilted) with the nut or bolt before applying pressure.
- Face an adjustable wrench "forward," adjust tightly and turn the wrench so pressure is against the permanent or fixed jaw.

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- Ensure that the teeth of a pipe wrench are sharp and free of oil and debris and that the pipe or fitting is clean to prevent unexpected slippage and possible injuries.
- Apply a small amount of pressure to a ratchet wrench initially to ensure that the ratchet wheel (or gear) is engaged with the pawl (a catch fitting in the gear) for the direction you are applying pressure.
- Support the head of the ratchet wrench when socket extensions are used.
- Pull on a wrench using a slow, steady pull; do not use fast, jerky movements.
- Stand aside when work is done with wrenches overhead.
- Make sure adjustable wrenches do not "slide" open during use.
- Keep tools well maintained (cleaned and oiled).
- Clean and place tools and wrenches in a tool box, rack or tool belt after use.
- Do not push on a wrench losing your balance is more likely if the wrench slips.
- Do not use a wrench that is bent or damaged.
- Do not use worn adjustable wrenches. Inspect the knurl, jaw and pin for wear.
- Do not pull on an adjustable wrench that is loosely adjusted.
- Do not use pipe wrenches on nuts or bolts.
- Do not use pipe wrenches for lifting or bending pipes.
- Do not use a wrench on moving machinery.
- Do not use the wrong tools for the job. For example, never use pliers instead of a wrench or a wrench as a hammer.
- Do not use a makeshift wrench.
- Do not insert a shim in a wrench for better fit.
- Do not strike a wrench (except a "strike face" wrench) with a hammer or similar object to gain more force.
- Do not increase the leverage by adding sleeved additions (e.g., a pipe) to increase tool handle length.
- Do not expose a wrench to excessive heat (like from a blow torch) that could affect the temper of the metal and ruin the tool.

#### 5.7.8 Files/Rasps

- Personnel will not use a file as a pry bar, hammer, screwdriver, or chisel.
- When using a file or a rasp, grasp the handle in one hand and the toe of the file in the other.
- Personnel will not hammer on a file.

#### 5.7.9 Chisels

- Personnel will not use a chisel that has a dull cutting edge.
- Personnel will not use chisels that have "mushroomed" striking heads.
- Hold a chisel by using a tool holder if possible.
- Clamp small work pieces in the vise and chip towards the stationary jaw when working with a chisel.

#### 5.7.10 Vises

- When clamping a long work piece in a vise, support the far end of the work piece by using an adjustable pipe stand, saw horse or box.
- Position the work piece in the vise so that the entire face of the jaw supports the work piece.

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- Personnel will not use a vise that has worn or broken jaw inserts, or has cracks or fractures in the body of the vise.
- Personnel will not slip a pipe over the handle of a vise to gain extra leverage.

#### 5.7.11 Clamps

- Personnel will not use the C-clamp for hoisting materials.
- Personnel will not use the C-clamp as a permanent fastening device.

#### 5.7.12 Jacks

- Personnel will not exceed the jack's rated lifting capacity as noted on the label of the jack.
- Clear all tools, equipment and any other obstructions from under the vehicle before lowering the jack.

#### 6.0 REFERENCE MATERIAL

SH&E SOP 601 – General Electrical Safety

#### 7.0 ATTACHMENTS

None

#### **8.0 REVISION HISTORY**

| Revision   | Date            | Change |
|------------|-----------------|--------|
| Original   | October 5, 2009 | N/A    |
| Revision 1 |                 |        |

|    | ΔΕζΟΜ  | SH&E No.: | 616             |
|----|--|-----------|-----------------|
|    | AECOM  | Rev:      | Original        |
| He | eat Stress Prevention Program                  | Data      | October 5, 2000 |
| AE | COM Safety, Health and Environmental Procedure | Date.     | October 5, 2009 |

# 1.0 PURPOSE

Establishes a heat stress prevention program to help assure that employees know and recognize the symptoms of heat stress-related illnesses and are prepared to take appropriate corrective action.

# 2.0 SCOPE

This procedure applies to all AECOM U.S.-based employees and operations.

# 3.0 DEFINITIONS

**Acclimated** – Workers who have developed physiological adaptation to hot environments characterized by increased sweating efficiency, circulation stability, and tolerance of high temperatures without stress. Acclimatization occurs after 7 to 10 consecutive days of exposure to heat and much of its benefit may be lost if exposure to hot environments is discontinued for a week.

**Chemical Protective Clothing (CPC)** – Apparel that is constructed of relatively impermeable materials intended to act as a barrier to physical contact of the worker with potentially hazardous materials in the workplace. Such materials include: Tyvek<sup>®</sup> coveralls (*all types*) and polyvinyl chloride (PVC) coveralls and rain suits.

**Un-acclimated** – Workers who have not been exposed to hot work conditions for one week or more, or who have become heat-intolerant due to illness or other reasons.

**Heat Cramps** – A form of heat stress brought on by profuse sweating and the resultant loss of salt from the body.

**Heat Exhaustion** – A form of heat stress brought about by the pooling of blood in the vessels of the skin and in the extremities.

**Heat Stress** – The combination of environmental and physical work factors that constitute the total heat load imposed on the body.

**Heat Stroke** – The most serious form of heat stress which involves a profound disturbance of the body's heat regulating mechanism.

#### 4.0 ROLES AND RESPONSIBILITIES

#### 4.1 PROJECT MANAGERS/FIELD TASK MANAGERS

- Evaluate the need for heat stress prevention measures and incorporate as appropriate into the Health and Safety Plan.
- Implement heat stress prevention measures, as applicable, at each work site
- Develop/coordinate a work-rest schedule, as applicable
- Ensure heat stress hazard assessments/evaluations were completed for the planned activities
- Assign personnel physically capable of performing the assigned tasks
- Ensure personnel are properly trained in the recognition of heat stress-related symptoms

- Provide heat stress awareness training
- Assist project teams develop appropriate work-rest schedules
- Conduct/support incident investigations related to potential heat stress-related illnesses

# 4.3 SITE SUPERVISORS

- Identify those tasks which may be most impacted by heat stress and communicate the hazard to the assigned employees
- Ensure employees have been trained on the recognition of heat stress-related illness
- Ensure that adequate supplies of appropriate fluids are readily available to employees
- Ensure that a proper rest area is available
- Conduct heat stress monitoring, as applicable
- Implement the work-rest schedule
- Ensure that first aid measures are implemented once heat stress symptoms are identified
- Ensure personnel are physically capable of performing the assigned tasks and are not in a physicallycompromised condition
- Report all suspected heat stress-related illnesses

# 4.4 EMPLOYEES

- Observe each other for the early symptoms of heat stress-related illnesses
- Maintain an adequate intake of available fluids
- Report to work in a properly vested condition
- Report all suspected heat stress-related illnesses

# 5.0 PROCEDURE

# 5.1 GENERAL REQUIREMENTS

Heat stress can be a significant field site hazard, especially for workers wearing CPC. The workforce will gradually work up to a full workload under potentially stressful conditions to allow for proper acclimation. Site personnel must be instructed in the recognition of heat stress symptoms, the first-aid treatment procedures for severe heat stress, and the prevention of heat stress injuries. Workers must be encouraged to immediately report any heat stress that they may experience or observe in fellow workers. Supervisors must use such information to adjust the work-rest schedule to accommodate such problems.

Wherever possible, a designated break area should be established in an air conditioned space, or in shaded areas where air conditioning is impractical. The break area should be equipped to allow workers to loosen or remove protective clothing, and sufficient seating should be available for all personnel. During breaks, workers must be encouraged to drink plenty of water or other liquids, even if not thirsty, to replace lost fluids and to help cool off. Cool water should be available at all times in the break area, and in the work area itself unless hygiene/chemical exposure issues prevent it.

Workers who exhibit ANY signs of significant heat stress (e.g., profuse sweating, confusion and irritability, pale, clammy skin), shall be relieved of all duties at once, made to rest in a cool location, and provided with large amounts of cool water. Anyone exhibiting symptoms of heat stroke (red, dry skin, or unconsciousness) must be taken immediately to the nearest medical facility, taking steps to cool the person during transportation (clothing

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removal, wet the skin, air conditioning, etc.). Severe heat stress (heat stroke) is a life-threatening condition that must be treated by competent medical authority.

#### 5.2 WORK-REST SCHEDULE

The prevention of heat stress is best performed through supervisor observation of employees and routine heat stress awareness training activities. However, it is also necessary to implement a work routine that incorporates adequate rest periods to allow workers to remove protective clothing, drink fluids (*vital when extreme sweating is occurring*), rest and recover. The frequency and length of work breaks must be determined by the work supervisor based upon the ambient temperature, amount of sunshine, humidity, the amount of physical labor being performed, the physical condition of the workers (e.g., acclimated/not), and protective clothing being used.

#### 5.2.1 Establishing a Work-Rest Schedule

AECOM permits the use of either of two techniques to initially determine an appropriate daily work-rest schedule. These methods are:

- <u>Wet Bulb Globe Thermometer (WBGT) Method</u> This method is preferred, if a WBGT meter is available.
- <u>Adjusted Temperature Method</u> This method should be used only if WBGT data is not available.

Either procedure will provide the work supervisor with a recommended routine; however, adjustments to this routine may be required to accommodate the specific daily conditions at the work site.

#### 5.2.2 WBGT Work-Rest Schedule Guidelines

Table 1, the *Non-CPC Activities WBGT Chart*, is intended for use where personnel are not utilizing CPC. Where workers are required to utilize CPC, Table 2, the *CPC Activities WBGT Chart*, will be used.

WBGT readings (in degrees Fahrenheit - <sup>o</sup>F) are compared directly with the values the applicable WBGT Chart for the applicable work rate (where light work corresponds to minimal physical activity besides standing/watching; very heavy work corresponds to significant, continuous physical labor) to determine the work-rest frequency.

|                     |            | <sup>o</sup> F–W | /BGT       |                    |
|---------------------|------------|------------------|------------|--------------------|
| Work-Rest Regimen   | Light Work | Moderate Work    | Heavy Work | Very Heavy<br>Work |
| Continuous Work     | 85         | 81               | 78         |                    |
| 75% Work – 25% Rest | 86         | 83               | 81         |                    |
| 50% Work – 50% Rest | 88         | 85               | 83         | 81                 |
| 25% Work – 75% Rest | 90         | 87               | 86         | 85                 |

Table 1. Non-CPC Activities WBGT Chart

Modified from ACGIH's 2002 Threshold Limit Values for Chemical Substances and Physical Agents, for acclimatized workers

|                     |            | <sup>o</sup> F–W | /BGT       |                    |
|---------------------|------------|------------------|------------|--------------------|
| Work-Rest Regimen   | Light Work | Moderate Work    | Heavy Work | Very Heavy<br>Work |
| Continuous Work     | 74         | 70               | 67         |                    |
| 75% Work – 25% Rest | 75         | 72               | 70         |                    |
| 50% Work – 50% Rest | 77         | 74               | 72         | 70                 |
| 25% Work – 75% Rest | 79         | 76               | 75         | 74                 |

#### Table 2. CPC Activities WBGT chart

Modified from ACGIH's 2002 Threshold Limit Values for Chemical Substances and Physical Agents, for acclimatized workers

#### 5.2.3 Adjusted Temperature Work-Rest Schedule Guidelines

This method can be utilized where WBGT data is not available, and requires only that the ambient temperature (*in degrees Fahrenheit* -  $^{\circ}F$ ) be known. Adjustment factors are applied to the ambient temperature to account for departures from ideal conditions (sunny conditions, light winds, moderate humidity and a fully acclimated work force). The adjustments will be made by addition or subtraction to the ambient temperature reading, or changes in table position, as indicated in Table 3. Adjustments are independent and cumulative, all applicable adjustments should be applied. The result is the *Adjusted Temperature*, which can be compared with the values in Table 4 for the applicable work rate (*where light work corresponds to minimal physical activity besides standing/watching; very heavy work corresponds to significant, continuous physical labor*) to determine the work-rest schedule.

| Time of Day   |      |  |  |  |
|---|------|--|--|--|
|   |      |  |  |  |
| Before daily temperature peak                                 | +2°F |  |  |  |
| 10 am – 2 pm (peak sunshine)                                  | +2°F |  |  |  |
| Sunshine  |      |  |  |  |
| No clouds   | +1°F |  |  |  |
| Partly Cloudy (3/8 – 5/8 cloud cover)                         | -3°F |  |  |  |
| Mostly Cloudy (5/8 – 7/8 cloud cover)                         | -5°F |  |  |  |
| Cloudy (>7/8 cloud cover)                                     | -7°F |  |  |  |
| Indoor or nighttime work                                      | -7°F |  |  |  |
| Wind (ignore if indoors or wearing CP                         | C)   |  |  |  |
| Gusts greater than 5 miles per hour at least once per minute  | -1°F |  |  |  |
| Gusts greater than 10 miles per hour at least once per minute | -2°F |  |  |  |
| Sustained greater than 5 miles per hour                       | -3°F |  |  |  |
| Sustained greater than 10 miles per hour                      | -5°F |  |  |  |
| Humidity (ignore if wearing CPC)                              |      |  |  |  |
| Relative Humidity greater than 90%                            | +5°F |  |  |  |
| Relative Humidity greater than 80%                            | +2°F |  |  |  |
| Relative Humidity less than 50%                               | -4°F |  |  |  |
| Chemical Protective Clothing (CPC)                            |      |  |  |  |
| Modified Level D (coveralls, no respirator)                   | +5°F |  |  |  |
| Level C (coveralls w/o hood, full-face respirator)            | +8°F |  |  |  |
|   |      |  |  |  |

#### **Table 3. Temperature Adjustment Factors**

<sup>&</sup>lt;sup>1</sup> This adjustment accounts for temperature rise during the day. If the temperature has already reached its daytime peak it can be ignored.

| Level C (coveralls with hood, full-face respirator) | +10°F                                   |
|---|---|
| Level B with airline system                         | +9°F                                    |
| Level B with SCBA                                   | +9°F and right one column <sup>2</sup>  |
| Level A   | +14°F and right one column <sup>2</sup> |
| Other   | Specified in the HASP                   |
| Miscellaneous                                       |   |
| Unacclimated work force                             | +5°F                                    |
| Partially acclimated work force                     | +2°F                                    |
| Working in shade                                    | -3°F                                    |
| Breaks taken in air conditioned space               | -3°F                                    |

Table 4. Work-Rest Schedule Based on Adjusted Temperature

|   |            | Adjusted Terr | nperature (°F) |                    |
|---|------------|---------------|----------------|--------------------|
| Work-Rest Regimen                           | Light Work | Moderate Work | Heavy Work     | Very Heavy<br>Work |
| No specified requirements                   | < 80       | < 75          | < 70           | < 65               |
| 15 minute break every<br>90 minutes of work | 80 – 90    | 75 - 85       | 70 - 80        | 65 – 75            |
| 15 minute break every<br>60 minutes of work | >90 – 100  | > 85 - 95     | >80 - 85       | >75 - 80           |
| 15 minute break every<br>45 minutes of work | >100 – 110 | >95 - 100     | >85 - 90       | >80 - 85           |
| 15 minute break every<br>30 minutes of work | >110 - 115 | >100 - 105    | >90 - 95       | >85 - 90           |
| 15 minute break every<br>15 minutes of work | >115 - 120 | >105 - 110    | >95 -100       | >90 - 95           |
| Stop Work                                   | >120       | >110          | >100           | >95                |

Note: Time spent performing decontamination or donning/doffing CPC should not be included in calculating work or break time lengths.

#### 5.3 WORK-REST SCHEDULE PRACTICES

- Intake of fluid will be increased beyond that which satisfies thirst, and it is important to avoid "fluid debt," which will not be made up as long as the individual is sweating
- Two 8-ounce glasses of water should be taken prior to beginning work, then up to 32 oz. per hour during the work shift; fluid replacement at frequent intervals is most effective
- The best fluid to drink is water; liquids like coffee or soda do not provide efficient hydration and may increase loss of water
- If commercial electrolyte drinks (e.g., Gatorade) are used, the drink should be diluted with water, or 8 ounces of water should be taken with each 8 ounces of electrolyte beverage
- Additional salt is usually not needed and salt tablets should not be taken
- Replacement fluids should be cool, but not cold

<sup>&</sup>lt;sup>2</sup> Locate the proper column based on work rate, then move one column to the right (next higher work rate) before locating the corresponding adjusted temperature.

- Breaks will be taken in a cool, shaded location, and any impermeable clothing should be opened or removed
- Dry clothing or towels will be available to minimize chills when taking breaks;
- Manual labor will not be performed during breaks, other than paperwork or similar light tasks;
- Other controls that may be used include:
  - Scheduling work at night or during the cooler parts of the day (6 am 10 am, 3 pm 7 pm)
  - Erecting a cover or partition to shade the work area
  - Cooling devices such as vortex tubes or cooling vests can be worn beneath protective garments. If cooling devices are worn, only physiological monitoring will be used to determine work activity

# 5.4 EVALUATING THE WORK-REST SCHEDULE'S EFFECTIVENESS

Once a work-rest schedule is established, the work supervisor must continually evaluate its effectiveness through observation of workers for signs/symptoms of heart stress. Measurement of each worker's vitals (e.g., pulse, blood pressure, and temperature) can provide additional information in determining if the schedule is adequate, and is accomplished as follows:

At the start of the workday each worker's baseline pulse rate (in beats per minute – bpm) is determined by taking a pulse count for 15 seconds and multiplying the result by four or an automated pulse count device may be utilized. Worker pulse rates can then be measured at the beginning and end of each break period to determine if the rest period allows adequate cooling by applying the following criteria:

- Each worker's maximum heart rate at the start of any break should be less than [180 minus workers age] bpm. If this value is exceeded for any worker, the duration of the following work period will be decreased by at least 10 minutes
- At the end of each work period all workers' heart rates must have returned to within +10% of the baseline pulse rate. If any worker's pulse rate exceeds this value the break period will be extended for at least 5 minutes, at the end of which pulse rates will be re-measured and the end-of-break criteria again applied

Use a clinical thermometer or similar device to measure the oral/ear temperature at the beginning (before drinking liquids) and end of each break period and apply the following criteria:

- If the oral temperature exceeds 99.6 °F, shorten the next work cycle by one-third without changing the rest period
- If the oral temperature still exceeds 99.6 °F at the beginning of the next rest period, shorten the following work cycle by one-third

Use of an automated or similar blood pressure device will be used to assess each employee's blood pressure at the beginning and end of each break period to determine if the rest period allows adequate cooling by applying the following criteria:

• If the blood pressure of an employee is outside of 90/60 to 150/90, then the employee will not be allowed to begin or resume work; extend the break period by at least five minutes, at the end of which blood pressure rates will be re-measured and the end-of-break criteria again applied

All physiological monitoring of heat stress will be documented using Attachment 1, *Heat/Cold Stress Monitoring Log*.

#### 5.5 HEAT STRESS-RELATED ILLNESS SYMPTOMS

#### 5.5.1 Heat Cramps

- Muscle spasms
- Pain in the hands, feet, and abdomen

#### 5.5.2 Heat Exhaustion

- Pale, cool, moist skin
- Heavy sweating
- Dizziness
- Nausea
- Fainting

#### 5.5.3 Heat Stroke

- Red, hot, usually dry skin
- Lack of or reduced perspiration
- Nausea
- Dizziness and confusion
- Strong rapid pulse
- Coma

#### 5.6 RECOMMENDED TREATMENT FOR HEAT STRESS-RELATED ILLNESSES

#### 5.6.1 Heat Cramps

- Move victim to a cool place
- Administer drinks of cool water
- Apply manual pressure to cramped muscles
- Seek medical attention if symptoms are not alleviated or if more serious problems are indicated

#### 5.6.2 Heat Exhaustion

- Move the victim to a cool place
- Remove as much clothing as possible
- Administer drinks of cool water
- Seek medical attention

#### 5.6.3 Heat Stroke

- Treat as a true medical emergency. Seek medical help immediately
- Reduce body temperature quickly
- Douse with cool water (not cold water)
- Wrap in wet sheet
- If available, use cold packs under arms, neck, and ankles
- Protect from injury during convulsion
- Assure an open airway for breathing
- Transfer to a medical facility

#### 5.7 TRAINING

Those personnel potentially exposed to heat stress will receive training including, but not limited to:

- Sources of heat stress, influence of protective clothing, and importance of acclimatization
- How the body handles heat

#### SH&E 616: Heat Stress Prevention Program

- Recognition of heat-related illness symptoms
- Preventative/corrective measures
  - Employees will be informed of the harmful effects of excessive alcohol consumption in the prevention of heat stress
  - All employees will be informed of the importance of adequate rest and proper diet in the prevention of heat stress
- First aid procedures for heat stress-related illnesses.

#### 6.0 REFERENCE MATERIAL

None

#### 7.0 ATTACHMENTS

Attachment 1 – Heat/Cold Stress Monitoring Log

#### 8.0 **REVISION HISTORY**

| Revision   | Date            | Change |
|------------|-----------------|--------|
| Original   | October 5, 2009 | N/A    |
| Revision 1 |                 |        |

|   |                                |                             |                                    | Hea                           | t/Cold                                  | Stres                       | s Mor                        | <u>itoring</u>               | <u>a Log</u>                       |                          |                                 |                            |                       | _               |             |
|---|--------------------------------|-----------------------------|------------------------------------|-------------------------------|---|-----------------------------|------------------------------|------------------------------|------------------------------------|--------------------------|---------------------------------|----------------------------|-----------------------|-----------------|-------------|
| The purpose of this form is to track supervisor-in-charge to ensure that  | entry into<br>: each per       | hot zon<br>son ente         | es wearing<br>ring the hc          | chemica<br>ot zone co         | Illy-protectiv<br>ompletes the          | e clothine<br>e required    | g and mc<br>I informa        | nitor emplc<br>tion. Vital s | yees for h                         | eat stress<br>oe taken l | -related illnes<br>y a competer | s. It is the<br>nt person. | responsibility        | of the fore     | eman or     |
| Project Name:   |                                |                             | Forema                             | an/Supe                       | rvisor:                                 |                             |                              |                              | Wo                                 | rk/Rest                  | schedule1:                      |                            | IN (min)              | OUT             | (min)       |
| Date:   | Pro                            | ater<br>vided <sup>2</sup>  | Acclim                             | lated <sup>3</sup>            | Initial<br>Vitals <sup>3</sup>          |                             |                              |                              | Vita                               | I Signs                  | and Time In                     | /Out <sup>4</sup>          |                       |                 |             |
| Employee Name   | Yes                            | No                          | Yes                                | No                            | Vitals                                  | Ч                           | Out                          | Vitals                       | Ц                                  | Out V                    | itals In                        | Out                        | Vitals                | 드               | Out         |
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| <ol> <li>Please refer to SH&amp;E 609, <i>Heat Stre</i></li> <li>Each employee should be provided i</li> <li>Δ worker is "archimeteal" if helch be a</li> </ol> | ess Preventi<br>a sufficient a | on Program.<br>Imount of wa | Section 5.2 pl<br>ater or sports d | rovides spec<br>rink before e | ific details on ho<br>ntering the hot z | w to develop<br>one. Drinks | a work-rest<br>such as coffe | schedule.<br>e and cola sho  | ould be discour.<br>a worker is no | aged.<br>t acclimated    | and "And" and re                | duce the "Min              | In" hv 50% for that   | ni eevolame     | ht the 7_10 |
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A worker is "acclimated" if he/she has worked in a hot environment for at least 7-10 consecutive days. If a worker is acclimated, check "Ves." If a worker is not acclimated, check "No" and reduce the "Min In" by 50% for that employee until the 7-10 day period is reached. "Vitals" refers to employee vital signs (e.g., pulse [P], blood pressure [BP], body temperature [Temp], etc.). Initial vitals must be taken and recorded before the start of work operations in the hot zone. Each time the employee exits the hot zone, vitals must be taken and vectore the start of work operations in the hot zone. Each time the employee exits the hot zone, vitals must be taken and vectore the start of work operations in the hot zone. Each time the employee exits the hot zone, vitals body temperature vital signs will be recorded in "F. 4

5.

# AECOM

|          | λεζομ   | SH&E No.: | 701             |
|----------|---|-----------|-----------------|
|          | AECOM   | Rev:      | Original        |
| Ha<br>Re | zardous Waste Operations and Emergency sponse (HAZWOPER) Activities | Date:     | October 5, 2009 |
| AE       | COM Safety, Health and Environmental Procedure                      |           |                 |

# 1.0 PURPOSE

Provides requirements for AECOM operations pertaining to hazardous waste and emergency response (HAZWOPER) services covered by 29 CFR 1910.120 (and equivalent state regulations).

# 2.0 SCOPE

This procedure applies to all AECOM U.S.-based employees and operations.

#### 3.0 DEFINITIONS

**Emergency Response** – A response effort by employees from outside the immediate release area or by other designated responders (i.e., mutual-aid groups, local fire departments, etc.) to an occurrence which results, or is likely to result, in an uncontrollable release of a hazardous substance. Responses to incidental release of hazardous substances where the substance can be absorbed, neutralized, or otherwise controlled at the time of release by employees in the immediate release area, or by maintenance personnel are not considered to be emergency responses within the scope of the HAZWOPER standard. Responses to releases of hazardous substances where there is no potential safety or health hazard are not considered to be emergency responses.

**Health and Safety Plan** – A document prepared for each project that contains site specific information including the Emergency Response Plan for the project.

**Incident Command System (ICS)** – ICS is a standardized on-scene incident management concept designed specifically to allow responders to adopt an integrated organizational structure equal to the complexity and demands of any single incident or multiple incidents without being hindered by jurisdictional boundaries. In the ICS the first person responding to an incident becomes the Incident Commander and turns that title and duties over to more qualified responders as they arrive on scene.

**First Responder** – First responders are individuals who are likely to witness or discover a hazardous substance release, injury, fire, or other incident and who have been trained to initiate an emergency response sequence by notifying the proper authorities of the release. They would take no further action beyond first aid, initial control of the incident, and notifying the authorities and others of the incident.

**Hazardous Materials Specialist** – Hazardous materials specialists are individuals who respond with and provide support to hazardous materials technicians. Their duties parallel those of the hazardous materials technician, however, those duties require a more directed or specific knowledge of the various substances they may be called upon to contain. The hazardous materials specialist would also act as the site liaison with federal, state, local, and other government authorities in regards to site activities.

**Hazardous Materials Technician** – Hazardous materials technicians are individuals who respond to releases or potential releases for the purpose of stopping the release. They assume a more aggressive role than a first responder in that they will approach the point of release in order to plug, patch, or otherwise stop the release of a hazardous substance.

**Incident Commander** – The Incident Commander (IC) is responsible for all aspects of the response, including developing incident objectives and managing all incident operations. The title and responsibilities are typically assumed by a qualified IC from the client or public sector.

# 4.0 ROLES AND RESPONSIBILITIES

# 4.1 REGIONAL OPERATIONS MANAGERS AND DISTRICT MANAGERS

- Provide support to the implementation of Health and Safety Plans and Emergency Action Plans
- Assure that there is no reprimand or reprisal associated with the initiation of a Stop Work Order

# 4.2 PROJECT MANAGERS

- Responsible for preparation and or requesting a HASP for every AECOM project
- Verifying all personnel working on the project are qualified
- Requesting client's emergency response procedures
- Appointing a SSO for each project
- Communicating the site-specific emergency response details to all employees assigned to a field project
- Assuring that the necessary communications equipment for the project is available
- Assuring that an accident/incident investigation is performed and a report filed

# 4.3 REGIONAL SH&E MANAGERS

- Provide technical guidance for the development and implementation of Health and Safety Plans and Emergency Action Plans
- Preparing emergency action plans as part of project HASPs and emergency reference sheets
- Interfacing with the local emergency responders when necessary
- Interfacing with clients regarding facility emergency response procedures
- Reviewing accident investigation reports

# 4.4 SITE SAFETY OFFICER

- Verifying a HASP is available for the project
- Communicating the site-specific emergency response details to all employees assigned to a field project
- Stopping work and initiating emergency response procedures
- Accounting for all AECOM and subcontractor employees after site evacuation
- Conducting pre-entry briefing and daily tailgate meeting and reviewing facility and site-specific emergency
  procedures
- Briefing on-site and off-site responders in the event of an emergency; and
- Completing accident/incident investigation reports

# 4.5 EMPLOYEES

- Maintain HAZWOPER training
- Following the HASP and emergency procedures prepared for the project
- Initiating emergency response via verbal communications or the alarm system if first to encounter the emergency

# 5.0 PROCEDURE

All personnel (e.g., AECOM employees, general laborers, equipment operators, chemists, supervisors, etc.) performing activities at hazardous waste sites which expose or potentially expose them to hazardous wastes and health hazards are considered HAZWOPER site workers and must meet the training and medical surveillance

#### SH&E 701: Hazardous Waste Operations (HAZWOPER) Activities

requirements specified in 29 CFR 1910.120(e) and (f), respectively. Additional training may be required based on site activities including related exposures and risks (e.g., confined space entry, excavations, fall protection, other materials [lead], etc.). These additional training requirements are to be outlined in the project- or site-specific health and safety plan (HASP).

#### 5.1 PERSONNEL QUALIFICATIONS – MEDICAL SURVEILLANCE AND TRAINING

HAZWOPER-qualified employees will participate in the following medical surveillance and training requirements.

#### 5.1.1 Medical Surveillance

- Specific HAZWOPER medical examination protocols have been developed by AECOM's Corporate Medical Provider (CMP) to meet the requirements of 29 CFR 1910.120(f). To be medically qualified to perform HAZWOPER work, employees receive the following medical examinations:
  - Initial (Baseline) Examination The initial examination is part of pre-employment requirements and must be completed (with results received) prior to the employee's start of work date.
  - Annual Examination HAZWOPER-qualified employees will complete a medical examination once each year. Medical qualification expires on the anniversary date of the last examination completed. There will be no "grace period" exemptions beyond this date without the express approval of the Regional SH&E Manager. At the recommendation of the SH&E Department, the CMP may approve an alternate examination frequency, at periods of up to two years (biennial), in cases where the worker's exposures to environmental contaminants are infrequent and typically well below any occupational exposure limits (e.g., senior management personnel).
  - Termination Examination When re-assigned to non-HAZWOPER duties, or at the conclusion of employment at AECOM, HAZWOPER-qualified personnel will be provided with the opportunity to receive a termination medical examination.
  - Special Examinations The SH&E Department and the CMP will jointly determine the need for special examinations due to:
    - Unusual exposure conditions.
    - In response to possible overexposures.
- The CMP will determine the medical protocol elements for each of these examinations based on exposure information provided by the SH&E Department. The CMP will evaluate the results of each employee's examination, and will provide a written statement of medical clearance clearly stating medical compliance with the HAZWOPER regulatory standard (29 CFR 1910.120(f)), and approval of the employee to perform unrestricted HAZWOPER activities. For Initial and Annual examinations, the CMP will also evaluate the employee for the use of air purifying and supplied air respiratory protection. The written evaluation from these examinations will indicate the CMP's approval/limitations on the employee's use of respiratory protection.

#### 5.1.2 AECOM Training

All personnel assigned to work at a hazardous waste site must participate in training meeting the requirements of 29 CFR 1910.120(e).

- Initial 40-Hour Training Before being assigned to a HAZWOPER site, AECOM employees must complete 40 hours of off-site training meeting the requirements of 29 CFR 1910.120(e)(3)(i). At the conclusion of training, personnel will receive a written certification of course completion, signed by the instructor, which indicates the course of instruction (40-hour HAZWOPER) and training dates. A copy of this certification must be provided to the employee's SH&E Coordinator. Employees are responsible for maintaining their own copy of this certificate and for presenting it to the site supervisor when working on any HAZWOPER site.
- <u>In addition to the initial 40 hour training</u>, the employee must receive three days of actual supervision by a trained experienced supervisor.
  - Available Training Sources:

#### SH&E 701: Hazardous Waste Operations (HAZWOPER) Activities

- On-site training provided by the SH&E Department
- Outsourced training providers approved by the SH&E Department
- <u>Refresher 8-Hour Training</u> To remain qualified to perform on-site HAZWOPER work activities, each AECOM employee will complete 8 hours of HAZWOPER refresher training meeting the requirements of 29 CFR 1910.120(e)(8) at yearly intervals following completion of Initial 40-hour training. At the conclusion of training, personnel will receive written certification of course completion, signed by the instructor, which indicates the course of instruction (8-hour HAZWOPER Refresher) and the training date. A copy of this certification must be provided to the employee's SH&E Coordinator. Employees are responsible for maintaining their own copy of this certificate and for presenting it to the site supervisor when working on any HAZWOPER site.
  - Available Training Sources:
    - Internet-based training approved by SH&E Department
    - On-site training provided by the SH&E Department
    - Outsourced training providers approved by the SH&E Department
  - <u>Supervisor 8-Hour Training</u> Any AECOM employee acting in a management capacity for HAZWOPER activities (e.g., project management personnel, field managers/foremen, site safety officers, etc.) must complete an additional 8 hours of HAZWOPER Supervisor training meeting the requirements of 29 CFR 1910.120(e)(4). While this training is required only once, supervisors must maintain their overall HAZWOPER qualification through annual completion of Refresher training. At the conclusion of Supervisor 8-Hour Training personnel will receive written certification of course completion, signed by the instructor, which indicates the course of instruction and the training date. A copy of this certification must be provided to the employee's SH&E Coordinator. Employees are responsible for maintaining their own copy of this certificate and for presenting it to the senior site supervisor when working on any HAZWOPER site.

• Available Training Sources:

- On-site training provided by the SH&E Department
- Outsourced training providers approved by the SH&E Department
- <u>24-Hour HAZWOPER Training</u> Site support contractors and site visitors may qualify to substitute 24hour HAZWOPER training in place of 40-hour training, as specified in 29 CFR 1910.120(e)(3)(ii). Personnel potentially qualifying for this alternative training include:
  - Site support personnel who will not work in any Exclusion Zone areas
  - Subcontractors and site visitors whose duties will not entail significant exposure to site contaminants defined as not working in any areas where airborne contaminant concentrations exceed one-half of any applicable occupational exposure limit, and no contact or exposure to materials with site contaminant concentrations exceeding natural background levels.

The Regional SH&E Manager or SH&E Department designee must approve the substitution of 24hour training for Initial 40-hour training. Persons qualifying for 24-hour training must provide written certification of course completion prior to beginning work on site. Persons completing 24-hour training must complete 8 hours of annual refresher training at the required interval to maintain eligibility for on-site work, and must provide proof of this training (as necessary to demonstrate retraining) prior to beginning work on site.

#### 5.1.3 Subcontractor Personnel

Any subcontractor organization whose employees will support AECOM operations at a HAZWOPER site will:

• Provide the AECOM Project Manager with a copy of their written HAZWOPER medical surveillance and training program requirements. The elements of the program(s) must be similar to those for AECOM's own program, as detailed above.

- Provide the Project Manager with written certification of a physician's approved medical clearance for each employee who will work on the site. Certification can be demonstrated by:
  - A copy of the physician's signed medical clearance for each employee (preferred), or
  - A letter identifying the medical status and clearance expiration date of every employee, signed by the company's safety director or an officer of the company.
- A copy of the each employee's training certifications, which <u>must</u> include:
  - The Initial 40-hour training certificate (24-hour training may be substituted with SH&E Department approval).
  - The most current Refresher training certificate (must be current within the previous one-year period).
  - A copy of the Supervisor training certificate for each person serving in a site supervisory capacity (e.g., field managers/foremen, site safety officers, etc.).

#### 5.2 PROJECT SH&E DOCUMENTATION – HEALTH AND SAFETY PLANS

The project SH&E documentation prepared for HAZWOPER activities is referred to as a site-specific Health and Safety Plan (HASP), and must meet the requirements presented in 29 CFR 1910.120(b)(4). The required plan elements include:

- 1. A description of the work location, the site history, and a summary of any information available concerning site hazards (including both physical hazards and contamination conditions).
- 2. A summary of the work activities to be performed under AECOM's scope of activities.
- 3. A safety and health risk or hazard analysis for each on-site task which will be performed. Identified risks must include both chemical and physical hazards to which personnel may be exposed during the conduct of the work task.
- 4. Protective measures for each work task to prevent or mitigate the potential hazards identified in the hazard analyses.
- 5. Personal protective equipment (PPE) requirements for each work task.
- 6. Frequency and types of air monitoring, personal monitoring, and environmental sampling techniques and instrumentation to be used.
- 7. Site control measures.
- 8. Decontamination procedures.
- 9. An emergency response plan (Attachment 4) addressing actions to be taken in the event of each type of credible incident which might result during the performance of planned work activities, including minor and major injuries, and chemical release and fire. Response plans must address the means for coordinating the evacuation of all on-site personnel in the event of a catastrophic incident.

Responsibility for development of each AECOM HASP will be coordinated between the Project Manager and the Regional SH&E Manager or SH&E Department designee as part of project initiation. Regardless of where the HASP is developed, it will be reviewed and approved by the SH&E Department prior to submission to any agency outside of AECOM.

#### **Contractors and Subcontractors**

AECOM Health and Safety Plans shall be generated to describe the measures to protect the health and safety of AECOM employees during their activities on site. The health and safety of any contractor's or subcontractor's employees is solely the responsibility of that contractor or subcontractor, who shall evaluate the hazards and potential hazards to their own employees and shall adhere to their own Health and Safety Plan. In addition, all AECOM subcontractors' Health and Safety Plans will, at a minimum conform to the requirements of the AECOM

#### SH&E 701: Hazardous Waste Operations (HAZWOPER) Activities

Health and Safety Plan. The AECOM Health and Safety Plan does not, nor is it intended to, address procedures of contractors or subcontractors during their site activities.

#### 5.3 FIELD EMERGENCY RESPONSE PLANS

AECOM employees are not expected to take action or participate in rescues or responses to chemical releases beyond the initial discovery of the release and immediate mitigation actions such as closing a valve, placing absorbents, and notifying the client and or public emergency response system (911.) If AECOM employees are to participate in the response to a chemical release beyond the initial reaction, there must be a contractual provision for this response and the employees must be specifically trained for this response. This document is designed to provide guidelines on how to prepare a written plan that will assure prompt and proper response to an emergency situation that arises during field investigations and to outline the duties of AECOM employees during a field emergency and the associated training requirements.

Site specific health and safety plans that are prepared to comply with the HAZWOPER standard (29 CFR 1910.120) must address emergency response. This standard specifically outlines the elements that must be contained in an emergency response plan. However, the definition of emergency response, as written in 29 CFR 1910.120, focuses on emergencies involving the uncontrolled release of hazardous substances. Under 29 CFR 1910.120, an employer can opt to evacuate their employees from the danger area when such an emergency occurs. AECOM does not expect its employees to actively assist in the handling of uncontrollable chemical releases that may occur during the implementation of field programs. As such, and as provided by the HAZWOPER standard, AECOM is exempt from the emergency response plan requirements of the standard as long as it provides an emergency action plan within the HASP that complies with 29 CFR 1910.38 (a). Therefore, all emergency response plans required under 29 CFR 1910.120 will be written to comply with 29 CFR 1910.38 (a).

The HAZWOPER standard does not prohibit AECOM employees from performing limited response activities. AECOM employees can provide response assistance by placing absorbent pillows or vermiculite around a small, contained spill that occurs during sampling efforts. AECOM's SH&E SOP 203 – *Spill Containment Program*, describes the specific procedures that AECOM will follow when responding to an incidental chemical spill.

#### 5.3.1 Field Project Preparation

Every HASP that is prepared by AECOM will contain an emergency response section in which the required elements of an emergency action plan will be contained. For all projects that do not require a HASP, an emergency reference sheet will be prepared that minimally lists the telephone numbers of the local emergency responders and the local hospital and provides directions to the local hospital. When AECOM is working at an operating facility, the emergency response procedures of the facility will be appended to the HASP or the emergency reference sheet.

There are two types of emergency situations that AECOM personnel must be prepared for and that must be addressed in the emergency action plan. These include:

- Emergencies related to the operations of our clients at the facility where AECOM is working
- Emergencies related to our own on-site activities/investigations

AECOM employees are typically not expected to take action or participate in responses to chemical releases beyond the initial discovery of the release and immediate mitigation actions such as closing a valve, placing absorbents, and notifying the client and or public emergency response system (911.)

AECOM employees are not to accept the role of Incident Commander without specific authority from the Regional SH&E Manager and the General Operations Manager responsible for the project. Assuming the role of the Incident Commander requires training beyond the scope of this Procedure.

#### 5.3.2 Client Facility Emergency Response Procedures

AECOM implements field programs on active properties, including manufacturing facilities. These facilities have typically developed an emergency response plan that is specific to facility-related emergencies. If AECOM is working at an operating facility, emergency procedures established by the facility must be followed in the event of a facility catastrophe. AECOM personnel must be aware of, and familiar with, the alarm signals used at the facility

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to alert personnel to an emergency. AECOM personnel must also know where to assemble in the event of a facility evacuation as the facility must be able to account for all personnel, including subcontractors such as AECOM in the event of an evacuation.

The first priority in AECOM's preparation of a project emergency action plan is to ensure that the responsibilities under the client's emergency response plan are fully understood. Due to the nature of their business, many of our clients have in-house fire brigades, medical staff, and hazardous materials teams that can assist AECOM in the event of an emergency related to our field activities. In many instances, our clients prefer or require that subcontractors seek emergency assistance through their facility first before calling outside responders to the site.

A copy of the facility's procedures must be made available to AECOM so that the information can be incorporated into the HASP or attached to the emergency reference sheet. If this information is not available to AECOM prior to arriving on site, the Site Safety Officer (SSO) must meet with client representatives upon arrival to the facility to review procedures in the event of an emergency related to plant operations.

#### 5.3.3 Emergency Action Plan

As a minimum, each emergency action plan must contain the following topics as required by 29 CFR 1910.38 (a):

- Procedures and contact information for reporting emergencies to public service responders and on-site (client or host employer) emergence control centers
- Emergency escape procedures and emergency escape route assignments
- Procedures to be followed by employees who remain to operate critical site operations before they evacuate
- Procedures to account for all employees after emergency evacuation is complete
- Rescue and medical duties for those employees who are to perform them
- Preferred means of reporting fires and other emergencies
- Personal Protective Equipment to protect employees from expected exposures and potential exposures during an emergency
- Names of persons or departments who can be contacted for further information (i.e. emergency reference sheet)
- Availability of medical surveillance for workers who might have been exposed to chemicals, bloodborne pathogens, or other biological agents as a result of project work or emergency response

In addition, each plan must establish the specific alarm system that will be used on site to warn employees of an AECOM emergency. The chosen alarm signals should not conflict with alarm signals already in place at the facility.

#### 5.3.4 Escape Routes and Procedures

Prior to the commencement of on-site activities, the SSO must determine how AECOM employees will evacuate each AECOM work area of the site. Two or more routes that are separate or remote from each other for each work area must be identified. Multiple routes are necessary in case one is blocked by fire or chemical spill. These routes must not overlap because if a common point were obstructed, all intersecting routes would be blocked.

Prominent wind direction should also be considered when designating escape routes and assembly areas. Escape routes and assembly areas should be upwind of the site whenever possible.

Upon arrival to the site, the SSO must verify that the selected routes are appropriate for evacuation. During an emergency, the quickest and most direct route should be selected. However, when working at an operating facility, the established escape routes of the facility should be used whenever possible. In the event of a facility-related emergency, all AECOM employees must meet at the facility's assembly area so the client can verify that AECOM has evacuated the property.

# 5.3.5 Accounting Method for All Employees after Evacuation

The SSO is responsible for determining that all AECOM employees have been successfully evacuated from the work area(s). It is the responsibility of each AECOM subcontractor to verify that all of their employees evacuated the site and report this information to the AECOM SSO. All employees must meet at the designated assembly area. The counting-of-heads method is an acceptable way to determine complete evacuation when the field team is of small size. The site log-in book should be referenced when attempting to account for more than 10 people. In the event of a facility-related emergency, the SSO must notify facility representatives that all AECOM employees and AECOM subcontract employees have successfully evacuated the work area(s). The SSO must notify emergency responders if any employee is unaccounted for and where on the site they were last seen.

In the event of a project-related emergency, the SSO will provide off-site emergency responders or on-site HAZMAT teams or fire brigades (Incident Commander) with all available knowledge about the emergency situation upon their arrival to the scene.

# 5.3.6 Employees Who Remain to Operate Critical Site Operations Before They Evacuate

All equipment and operations are required to cease in accordance with the established alarm signal procedures. The only exception will be related to health and safety. The SSO must determine at the time of the emergency if health and safety will be jeopardized by immediate stoppage of any particular piece of equipment. If such a determination is made, personnel involved in critical operations must be minimized. Once it is determined that the operation is no longer needed or the threat to the operators is imminent, operations will cease and the operators will immediately evacuate.

# 5.3.7 Rescue and Medical Duties

Only currently trained individuals will administer first aid or CPR. If the injury is life threatening, the Emergency Medical System (EMS) should be called (911.) Depending on the procedures established for the project, the SSO would contact an emergency responder directly or notify the facility representatives for medical assistance. If the employee needs medical attention that can not be provided on-site, the SSO shall escort the individual to the local hospital identified on the emergency reference sheet and remain with the person until release or admittance is determined. The escort will relay all appropriate medical information to the Project Manager and Regional SH&E Manager.

# 5.3.8 Preferred Means of Reporting

Unless facility representatives specifically indicate that they prefer AECOM personnel to notify them first of an emergency, the SSO will directly contact the appropriate emergency responders listed on the emergency reference sheet.

# 5.3.9 Alarm Signals

An emergency communication system must be in effect at all sites. The most simple and effective emergency communication system in many situations will be direct verbal communications. However, verbal communications must be supplemented any time voices cannot be clearly perceived above ambient noise levels and any time a clear line-of-sight can not be easily maintained amongst all AECOM personnel because of distance, terrain or other obstructions.

Portable two-way radio communications may be used when employees must work out of the line-of-sight of other workers.

When verbal communications must be supplemented, the following emergency signals shall be implemented using hand-held portable air-horns, whistles, or similar devices. Signals must be capable of being perceived above ambient noise by all employees in the affected portions of the workplace.

- One Blast: General Warning A relatively minor and localized, yet important ,event on-site. An example of this type of an event would be a minor chemical spill where there is no immediate danger to life or health yet personnel working on the site should be aware of the situation so unnecessary problems can be avoided. If one horn blast is sounded, personnel must stop all activity and equipment on-site and await further instructions from the SSO.
- Three Blasts: Medical Emergency A medical emergency where immediate first aid or emergency medical care is required. If three horn blasts are sounded, all first aid and/or CPR trained personnel

should respond as appropriate. All other activity and equipment should stop and personnel should await further instructions from the SSO.

- Three Blasts Followed by One Continuous Blast: Immediate Threat to Life and Health A situation that could present an immediate danger to life and health of personnel onsite. Examples include fires, explosions, large hazardous chemical release, severe weather-related emergencies, or security threats. If three horn blasts followed by a continuous blast are sounded, all activity and equipment must stop. All personnel must evacuate the site and meet in the designated assembly area where the SSO will account for all employees. The SSO will arrange for other emergency response actions if necessary. Information concerning the need to follow decontamination procedures during an emergency evacuation will be addressed in the emergency action plan.
- The SSO or his designate will acknowledge the distress signal with two short blasts on the air-horn or whistle.
- One Continuous Blast Following Any of the Above: All Clear/Return to Work Personnel who sound the initial alarm are required to send an all clear signal when the emergency is over.

#### 5.3.10 Emergency Reference Sheet

An emergency reference sheet (see Attachment 4) must be prepared for projects not requiring a HASP. Each emergency reference sheet must list the following:

- Emergency phone numbers for local police, fire, and ambulance service
- In-house facility extensions for reporting an emergency (applies to operating facilities only)
- · Phone number and address of closest hospital with an emergency room to the site
- Directions to the hospital from the site
- Map highlighting the site-to-hospital route
- Phone number for the Poison Control Center
- Names and phone numbers of AECOM representatives and facility representatives

#### 5.3.11 On-site and Off-site Communications

Regardless of the size or location of AECOM's field projects, it is extremely important that both on-site and offsite communications be maintained so that in the event of an emergency, employees can contact each other or place a phone call immediately with the appropriate responder(s).

Walkie-talkies are required when members of the field team are working in separate areas of the site and verbal communications are no longer effective due to distance. A walkie-talkie must be available for each team that is working in a separate area of the site.

When AECOM is working at an occupied facility, access to a telephone may not be a problem. When AECOM is working on abandoned properties or when there is no access to a phone, a cellular telephone must be brought to the work location.

#### 5.3.12 Evacuation

Although emergency evacuation procedures are included in AECOM's initial 40-hour HAZWOPER training, emergency procedures at each site will be different. Therefore, employees must be instructed about the specifics of the emergency procedures developed for the site during the site-specific pre-entry briefing that must be held daily prior to the commencement of field activities. Update training is required anytime escape routes or procedures change. An evacuation drill will be conducted for projects that are scheduled for one month or longer. Visitors and untrained employees shall not be allowed into the project area until they receive a safety briefing including evacuation alarms and procedures.

#### 5.3.13 First Responder

First responders shall have sufficient training or have had sufficient experience to objectively demonstrate competency in the following areas:

- An understanding of what hazardous substances are, and the risks associated with them in an incident
- An understanding of the potential outcomes associated with an emergency
- The ability to recognize the presence of hazardous substances and physical hazards in an emergency
- An understanding of the role of the first responder
- The ability to realize the need for additional resources, and to make appropriate notifications to the communication center

#### 5.3.14 First Responder HAZWOPER Operations Level

First responders at the operations level are individuals who respond to releases or potential releases of hazardous substances as part of the initial response to the site for the purpose of protecting nearby persons, property, or the environment from the effects of the release. They are trained to respond in a defensive fashion without actually trying to stop the release. Their function is to contain the release from a safe distance, keep it from spreading, and prevent exposures. First responders at the operational level shall have received at least eight hours of training or have had sufficient experience to objectively demonstrate competency in the following areas in addition to those listed for the awareness level and the employer shall so certify:

- Knowledge of the basic hazard and risk assessment techniques
- Know how to select and use proper personal protective equipment provided to the first responder operational level
- An understanding of basic hazardous materials terms
- Know how to perform basic control, containment, and/or confinement operations within the capabilities of the resources and personal protective equipment available with their unit
- Know how to implement basic decontamination procedures
- An understanding of the relevant standard operating procedures and termination procedures

#### 5.3.15 Hazardous Materials Technician

Hazardous materials technicians shall have received at least 24 hours of training equal to the first responder operations level and in addition have competency in the following areas and the employer shall so certify:

- Know how to implement the employer's emergency response plan
- Know the classification, identification, and verification of known and unknown materials by using field survey instruments and equipment
- Be able to function within an assigned role in the Incident Command System
- Know how to select and use proper specialized chemical personal protective equipment provided to the hazardous materials technician
- Understand hazard and risk assessment techniques
- Be able to perform advance control, containment, and/or confinement operations within the capabilities of the resources and personal protective equipment available with the unit
- Understand and implement decontamination procedures
- Understand termination procedures
- Understand basic chemical and toxicological terminology and behavior

#### 5.3.16 Hazardous Materials Specialist

Hazardous materials specialists shall have received at least 24 hours of training equal to the technician level and in addition have competency in the following areas and the employer shall so certify:

• Know how to implement the local emergency response plan

- Understand classification, identification, and verification of known and unknown materials by using advanced survey instruments and equipment
- Know the state emergency response plan
- Be able to select and use proper specialized chemical personal protective equipment provided to the hazardous materials specialist
- Understand in-depth hazard and risk techniques
- Be able to perform specialized control, containment, and/or confinement operations within the capabilities of the resources and personal protective equipment available
- Be able to determine and implement decontamination procedures
- Have the ability to develop a site safety and control plan
- Understand chemical, radiological, and toxicological terminology and behavior

#### 5.4 PERSONAL PROTECTIVE EQUIPMENT (PPE) ENSEMBLES

Defined HAZWOPER PPE ensembles are specified for general use on all AECOM HAZWOPER operations. The project HASP may specify modifications to these requirements to meet site-specific conditions.

#### 5.4.1 Level D Ensemble

The Level D ensemble provides a minimal level of skin protection (primarily against physical rather than chemical hazards) and no respiratory protection. Level D PPE is the minimum work uniform which will be used on HAZWOPER sites. Its use is appropriate when there is no significant potential for encountering hazardous substances or health hazards while working in controlled work areas.

#### Level D Equipment List

- Hard hat
- Eye protection
- Safety-toe work boots
- Shirts with sleeves and long pants (shorts are unacceptable for use)
- Hearing protection (as required)

#### 5.4.2 Modified Level D Ensemble

The Modified Level D ensemble provides moderate skin protection against contact with hazardous substances, but no respiratory protection. Its use is appropriate where there is a moderate-to-low potential for skin contact with known hazardous substances and health hazards, but no significant inhalation hazard is anticipated. The Modified Level D ensemble will consist of the Level D ensemble, supplemented by the addition of one or more of the following items:

#### Modified Level D Equipment List

- Chemical-resistant disposable outer coveralls
- Chemical-resistant outer gloves taped to outer coveralls<sup>1</sup>
- Chemical-resistant inner gloves<sup>1</sup>
- Chemical-resistant safety-toe boots (taped to outer coveralls)

#### 5.4.3 Level C Ensemble

The Level C ensemble provides moderate skin protection against contact with hazardous substances and moderate respiratory protection. Its use is appropriate where there is the potential for skin contact with known

<sup>&</sup>lt;sup>1</sup> Selection of specific glove types/materials will be provided in the project HASP based on consideration of the contaminants and the physical conditions of the work.

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hazardous substances and health hazards, together with a limited and well-defined potential for exposure via inhalation.

#### Level C Equipment List

- Full-face air-purifying respirator (APR) equipped with cartridge types as designated in the project HASP<sup>2</sup>
- Chemical-resistant disposable outer coveralls
- Chemical-resistant outer gloves taped to outer coveralls<sup>3</sup>
- Chemical-resistant inner gloves<sup>3</sup>
- Hard hat
- Safety-toe boots taped to coveralls; the use of boot covers (e.g., booties) or chemical-resistant boots may be specified
- Hearing protection (as required)

#### 5.4.4 Level B Ensemble

The Level B ensemble provides both the highest level of inhalation exposure protection, and considerable skin contact protection. Its use is appropriate where there are significant known or suspected hazardous substances and health hazards, involving both skin and inhalation exposure (up to and including Immediately Dangerous to Life or Health [IDLH] conditions), or where adverse atmospheric conditions cannot be mitigated by use of air purifying respirators (e.g., oxygen deficient atmospheres or chemicals with poor warning properties). The use of Level B PPE requires prior approval by the Regional SH&E Manager.

#### Level B Equipment List

- Supplied air respirator (SCBA or air line system with Grade D or better breathing air)
- Chemical-resistant disposable outer coveralls
- Chemical-resistant outer glove taped to outer coveralls<sup>3</sup>
- Chemical-resistant inner gloves<sup>3</sup>
- Hard hat
- Chemical resistant safety-toe boots taped to coveralls
- Hearing protection (as required)

#### 5.4.5 Level A Ensemble

The Level A ensemble provides the highest level of both respiratory and skin protection, up to and including protection against skin contact with vapor-phase contaminants. <u>The use of Level A PPE requires prior approval by the Corporate SH&E Director</u>.

Specific Level A ensemble components will be determined on a case-by-case basis by the SH&E Department.

#### 5.5 EMPLOYEE EXPOSURE MONITORING

Exposure monitoring at HAZWOPER sites will be conducted to determine explosive and oxygen levels, monitor and control employee exposures to airborne contaminants, and to determine and regulate controlled work area boundaries (e.g., support zone, contamination reduction zone, and exclusion zone) for the protection of non-HAZWOPER workers and the general public.

<sup>&</sup>lt;sup>2</sup> Selection of specific cartridges will be made by the SH&E Department (or Competent Person – Respiratory Protection as designated by the DSM) based on contaminants present. A cartridge change-out frequency will also be specified in the HASP based on the manufacturer's cartridge performance data

<sup>&</sup>lt;sup>3</sup> Selection of specific glove types/materials will be provided in the project HASP based on consideration of the contaminants and the physical conditions of the work.

# 5.5.1 Direct Reading Exposure Monitoring Requirements

Explosive levels, oxygen levels, and airborne contaminants present potential hazards to HAZWOPER personnel working within controlled work areas, and to non-HAZWOPER workers and the general public present outside the controlled work areas. On-site exposure monitoring will be utilized to assess the magnitude of these hazards, and provide indications of any necessary control procedures to mitigate unacceptable hazards. Attachment 1 will be used to record all monitoring efforts using direct reading instruments, and will remain part of the project file.

Specific exposure monitoring requirements will be established in individual HASPs and implemented by the project team(s) subject to the following requirements:

| Direct Reading Instrument   | Example Trade Names                 | Use  |
|---|-------------------------------------|--|
| Flame Ionization Detector (FID)   | OVA                                 | Detection of select organic vapors   |
| Photo ionization detector (PID)   | miniRAE, Micro-TIP                  | Detection of select organic vapors   |
| Portable gas chromatograph  | OVA                                 | Detection of select organic vapors   |
| Explosive meter   | MSA ALTAIR, QRAE II, BW<br>GasAlert | Determine explosiveness (as a percent<br>of the Lower Explosive Limit [LEL])       |
| Oxygen monitor  | MSA ALTAIR, QRAE II, BW<br>GasAlert | Determine oxygen concentration (in percent)  |
| Single gas meters (mono-tox) <ul> <li>Hydrogen sulfide</li> <li>Carbon monoxide</li> <li>Oxides of nitrogen</li> <li>Cyanide</li> </ul> |                                     | Determine airborne concentrations of selected contaminants (in parts per million)  |
| Colorimetric Detector Tubes   | Drager                              | Determine airborne concentrations of selected contaminants (in parts per million)  |
| Aerosol monitor   | Mini-RAM                            | Determine airborne particulate<br>concentration (in milligrams per cubic<br>meter) |

• Direct reading instrumentation will be used in accordance with the following Table:

Selected instruments will be capable of discriminating contaminant concentrations to concentrations of at least one-half of the HASP-specified exposure limit. All direct-reading instrumentation will be calibrated daily as directed by the manufacturer. Attachment 2 will be used to record instrument calibrations.

#### 5.5.2 Work Area Exposure Monitoring

- Work area exposure monitoring will include breathing zone readings for the maximum exposed worker(s)
- Results will be used to determine adequacy of PPE (especially respiratory protection). Specific criteria for upgrade/downgrade will be established in the HASP

#### 5.5.3 Perimeter Exposure Monitoring

- Perimeter air samples will be collected when the potential exists for airborne contaminants to migrate offsite
- Perimeter exposure monitoring will be conducted at locations downwind from the project activities at a minimum (also upwind if the potential exists for offsite contamination to migrate onto the site)
- Results will be used to determine if the existing controlled work area boundaries are adequate, and/or if work operations present unwarranted hazards to off-site personnel

# 5.5.4 Personal Exposure Monitoring

- Personal exposure monitoring will be conducted to determine individual exposures, as specified in the HASP or as directed by the SH&E Department
- Sample results will be recorded in a log book or on the sample log form provided in Attachment 3
- Records will indicate individual name, SSN (last 4 digits is acceptable), and job/operation at the time of sample collection
- Samples sent out for independent laboratory analysis will follow chain of custody requirements
- Exposure results will be posted on site and explained in a safety briefing
- Employees will receive a written statement of results within 15 days of receipt from the laboratory
- Results of all personal exposure monitoring will be provided to the SH&E Department for inclusion in the employee medical records

#### 6.0 REFERENCE MATERIAL

29 CFCR 1910.120, Hazardous Waste Operations and Emergency Response

- 29 CFR 1910.38, Emergency Action Plans
- SH&E 109 SH&E Training Programs
- SH&E 114 Respiratory Protection Program
- SH&E 115 Personal Protective Equipment (PPE)
- SH&E 301 Project SH&E Planning Documentation
- SH&E 401 Medical Monitoring
- SH&E 404 Employee Notification of Exposure Monitoring Results

Federal Emergency Management Agency – FEMA: Incident Command System

# 7.0 ATTACHMENTS

- Attachment 1 Direct Reading Instrument Monitoring Log
- Attachment 2 Instrument Calibration Log
- Attachment 3 Personal Sampling Data Sheet
- Attachment 4 Emergency Information and Hazard Assessment

# **8.0 REVISION HISTORY**

| Revision   | Date            | Change |
|------------|-----------------|--------|
| Original   | October 5, 2009 | N/A    |
| Revision 1 |                 |        |

# Direct Read Instrument Monitoring Log

| Project:         |          | Job No.:        |                          |  |  |  |
|------------------|----------|-----------------|--------------------------|--|--|--|
| Date:            |          | Operator:       |                          |  |  |  |
| Instrument:      |          | Calibration     | :                        |  |  |  |
|                  |          |                 | (Amt, Component, Date)   |  |  |  |
| Sampling Technie | que:     |                 |                          |  |  |  |
|                  |          |                 |                          |  |  |  |
| Sample Interval: |          |                 |                          |  |  |  |
| Background Read  | ling:    |                 |                          |  |  |  |
| Action Level/Res | sponse:  |                 | [                        |  |  |  |
| Time             | Location | Reading (units) | Detection Limits (Scale) |  |  |  |
|                  |          |                 |                          |  |  |  |
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|                  |          |                 |                          |  |  |  |

# **Instrument Calibration Log**

| Inst                      | rument Information  |
|---------------------------|---------------------|
| Instrument Name:          | Manufacturer:       |
| Serial Number:            | Last Service Date:  |
| Parameter(s):             | Calibration Gas:    |
| Calibration Procedure:    |                     |
|                           |                     |
|                           |                     |
| <br>Daily                 | Calibration Results |
| Date: Calibration Result: |                     |
| Name: Signature:          |                     |
| Notes:                    |                     |
|                           |                     |
| Date: Calibration Result: |                     |
| Name: Signature:          |                     |
| Notes:                    |                     |
|                           |                     |
| Date: Calibration Result: |                     |
| Name: Signature:          |                     |
| Notes:                    |                     |
| Date: Calibration Result: |                     |
| Name: Signature:          |                     |
| Notes:                    |                     |
|                           |                     |
| Proiect:                  | Job No.:            |
| Date:                     | Operator:           |
| Instrument:               | Calibration:        |

| Client:   |          |          |            |           |               |              |               | Metho              | <del>]</del> :        |      |                |                                  |   |
|-----------|----------|----------|------------|-----------|---------------|--------------|---------------|--------------------|-----------------------|------|----------------|----------------------------------|---|
| Site Loci | ation: _ |          |            |           |               |              |               | Job No             |                       |      | ŭ              | ampling Mee                      | lia:  |
| Sample    | Pump     | Air Flow | Calibratio | n (L/min) | Start<br>Time | Stop<br>Time | Total<br>Time | Volume<br>(Liters) | Sampler's<br>Initials | Date | Re             | sults                            | Remarks                                       |
| 1         |          | Pre      | Post       | Average   |               |              | Minutes       |                    |                       |      | Amount<br>(mg) | Conc. ppm ,<br>mg/m <sup>3</sup> | (Location of sampling, Employee<br>name, SSN) |
|           |          |          |            |           |               |              |               |                    |                       |      |                |                                  |   |
|           |          |          |            |           |               |              |               |                    |                       |      |                |                                  |   |
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|           |          |          |            |           |               |              |               |                    |                       |      |                |                                  |   |

### **EMERGENCY INFORMATION AND HAZARD ASSESSMENT**

#### EMERGENCY REFERENCES

| Ambulance: | 911 |
|------------|-----|
| Fire:      | 911 |
| Police:    | 911 |
|            |     |

Medical Services/

Regional Hospital (including a internet map is advisable):

#### **Poison Control Center**

http://www.aapcc.org/poison4.htm

#### **Emergency Muster Point**

In case of a site/facility emergency, please meet at

The escape route from the site and an emergency muster point will be determined and provided to all workers during the project mobilization.

."

| Client Contacts: |        |      |  |  |
|------------------|--------|------|--|--|
|                  | Office | Cell |  |  |
|                  |        |      |  |  |
|                  |        |      |  |  |

AECOM Project Representatives: Office Mobile

#### AECOM Medical Records and Medical Consultant WorkCare

Anaheim, CA 94502 Telephone: 800-455-6155

|                                      | ΔΕζΟΜ  | SH&E No.: | 702             |
|--------------------------------------|--|-----------|-----------------|
|                                      | AECOM  | Rev:      | Original        |
| Working at RCRA-Regulated Facilities |  | Data      | October 5, 2000 |
| AE                                   | COM Safety, Health and Environmental Procedure | Date:     | October 5, 2009 |

# **1.0 PURPOSE**

AECOM employees who conduct activities under the Resource Conservation and Recovery Act (RCRA) at treatment, storage and disposal (TSD) facilities regulated by 40 CFR Parts 264 and 265 pursuant to RCRA or by agencies under agreement with the United States Environmental Protection Agency (EPA) to implement RCRA regulations, that their activities conform to the requirements including enumerated at 29 CFR 1910.120 (p) of the standard.

# 2.0 SCOPE

This procedure applies to all AECOM U.S.-based employees and operations.

#### 3.0 DEFINITIONS

None

#### 4.0 ROLES AND RESPONSIBILITIES

#### 4.1 PROJECT MANAGER/FIELD TASK MANAGER/SUPERVISOR

Project Managers are required to identify whether their projects are regulated under RCRA and working with their local Safety, Health, and Environment (SH&E) Manager, to determine the applicability of this procedure to their projects.

#### 4.2 REGIONAL SH&E MANAGER

Provides technical guidance as to this procedure

#### 4.3 EMPLOYEES

Are responsible for abiding by this procedure

#### 5.0 PROCEDURE

The project manager, working with their local SH&E manager, will develop and implement a written projectspecific, health and safety program (HASP) for AECOM employees involved in RCRA hazardous waste operations. All project-specific HASPs shall be available for inspection by AECOM employees, their representatives and OSHA personnel. The project-specific HASP shall be designed to identify, evaluate and control safety and health hazards at the project site for the purpose of employee protection, to provide for emergency response meeting the requirements of paragraph (p) (8) of this section and to address as appropriate site analysis, engineering controls, maximum exposure limits, hazardous waste handling procedures and uses of new technologies as appropriate.

#### 5.1 HAZARD COMMUNICATION (SEE SH&E SOP 504 – HAZARD COMMUNICATION PROGRAM)

On all projects where chemical use is regulated under 29 CFR Hazard Communication, the following procedure will be implemented along with conformance with AECOM SOP SH&E 501:

#### SH&E 702: Working at RCRA Regulated Sites

- 1. Compile and maintain a list of the hazardous chemicals brought to or used at a specific site subject to the requirements or 29 CFR 1910.1200.
- 2. Have readily available, a MSDS for each item regulated under 29 CFR 1910.1200.
- 3. Inform all employees of the hazards of non-routine tasks involving regulated items that they may be asked to perform.
- 4. Inform employees of the hazards associated with chemicals contained in unlabeled pipes, vessels, process lines, etc. in their work areas.
- 5. On multi-employer worksites, provide other employers with information about labeling systems and precautionary measures where their employees are exposed to chemicals brought on site by AECOM.
- 6. Make the written program available to employees and their designated representatives.

#### 5.2 MEDICAL SURVEILLANCE (SEE SH&E SOP 401 – MEDICAL SURVEILLANCE PROGRAM)

The medical surveillance program, where applicable, shall be instituted by AECOM for the following employees:

- 1. All employees who are or may be exposed to hazardous substances or health hazards at or above the established permissible exposure limit, above the published exposure levels for these substances, without regard to the use of respirators, for 30 days or more a year.
- 2. All employees who wear a respirator for 30 days or more a year or as required by 1910.134.
- 3. All employees who are injured, become ill or develop signs or symptoms due to possible overexposure involving hazardous substances or health hazards from an emergency response or hazardous waste operation.
- 4. Members of HAZMAT teams.

All costs associated with medical surveillance of AECOM personnel will be borne by AECOM.

#### 5.3 DECONTAMINATION

- 1. AECOM will develop a decontamination procedure on a project-specific basis. This procedure will be communicated to employees and implemented before any employees or equipment may enter areas on site where there may be potential for exposure to hazardous substances.
- 2. Standard operating procedures to minimize employee contact with hazardous substances or with equipment that has contacted hazardous substances are available on the Health and Safety Department's intranet.
- 3. All employees leaving a contaminated area (hot zone) shall be appropriately decontaminated.
- 4. All contaminated clothing and equipment leaving a contaminated area shall be appropriately disposed of or decontaminated.
- 5. Unauthorized employees will be restricted from the decontamination areas and change rooms.
- 6. Decontamination procedures shall be monitored by the site safety and health supervisor to determine their effectiveness. When such procedures are found to be ineffective, appropriate steps shall be taken to correct any deficiencies.

#### 5.3.1 Location

Decontamination shall be performed in geographical areas that will minimize the exposure of uncontaminated employees or equipment to contaminated employees or equipment.

#### 5.3.2 Equipment and solvents

All equipment and solvents used for decontamination shall be decontaminated or disposed of properly.

#### 5.3.3 Personal protective clothing and equipment

- 1. Protective clothing and equipment shall be decontaminated, cleaned, laundered, maintained or replaced as needed to maintain its effectiveness.
- 2. Employees whose non-impermeable clothing becomes wetted with hazardous substances shall immediately remove that clothing and proceed to the decontamination shower.
- 3. The clothing shall be disposed of or decontaminated before it is removed from the work zone.

#### 5.3.4 Unauthorized employees

Unauthorized employees shall not remove protective clothing or equipment from change rooms.

#### 5.3.5 Commercial laundries or cleaning establishments

Commercial laundries or cleaning establishments that decontaminate protective clothing or equipment shall be informed of the potentially harmful effects of exposures to hazardous substances.

#### 5.3.6 Showers and Change Rooms

Where the decontamination procedure indicates a need for regular showers and change rooms outside of a contaminated area, they shall be provided and they shall meet the requirements of 29 CFR 1910.141. If temperature conditions prevent the effective use of water, then other effective means for cleaning shall be provided and used.

#### 5.4 NEW TECHNOLOGY PROGRAM

To the extent feasible, AECOM will employ effective new technologies and equipment developed for the improved protection of employees working with hazardous waste clean-up operations. The same technologies shall be implemented as part of the site health and safety program to assure that employee protection is being maintained.

New technologies, equipment or control measures available to the industry such as the use of foams, absorbents, neutralizers, or other means to suppress the level of air contaminants while excavating the site or for spill control, will be evaluated by AECOM. Such an evaluation will be done to determine the effectiveness of the new methods, materials, or equipment before implementing their use on a large scale for enhancing employee protection. Information and data from manufacturers or suppliers may be used as part of the evaluation effort.

#### 5.5 TRAINING

AECOM has developed and implemented a training program which is part of our health and safety program for employees exposed to health hazards or hazardous substances at TSD operations to enable the employees to perform their assigned duties and functions in a safe and healthful manner so as not to endanger themselves or other employees. The initial training shall be for at least 24 hours and refresher training shall be for eight hours annually. Employees who have received the initial training will be given a wallet-size, laminated certificate attesting that they have successfully completed the necessary training. The certificate will include: the employee's name; the expiration date; and, the respirator size and model on which the employee was fit-tested. NT will indicate no respirator training.

AECOM employees with previous work experience and/or training that is equivalent to the initial training required by the standard will be considered as meeting the initial training requirements of the standard as to that employee. Equivalent training includes the training that existing employees might have already received from actual site work experience. Current employees shall receive eight hours of refresher training annually. They will be given a wallet-size, laminated certificate attesting that they have successfully completed the necessary refresher training. The certificate will include: the employee's name; the expiration date; and, the respirator size and model on which the employee was fit-tested. The SH&E Department will keep an employee matrix indicating which employees are currently certified to conduct HAZWOPER/RCRA activities.



All third-party training vendors or internal AECOM trainers who teach initial and refresher training subjects have satisfactorily completed a training course for teaching the subjects they are expected to teach or they have the academic credentials and instruction experience necessary to demonstrate a good command of the subject matter of the courses and competent instructional skills.

#### 5.6 EMERGENCY RESPONSE

An emergency response plan will be developed for each project site and will be included as a separate section of the site –specific health and safety plan. The emergency response plan will address, at a minimum, the following elements:

- 1. Pre-emergency planning and coordination with outside parties.
- 2. Personnel roles, lines of authority, training, and communication.
- 3. Emergency recognition and prevention.
- 4. Safe distances and places of refuge.
- 5. Site security and control.
- 6. Evacuation routes and procedures.
- 7. Decontamination procedures.
- 8. Emergency medical treatment and first aid.
- 9. Emergency alerting and response procedures.
- 10. Critique of response and follow-up.
- 11. PPE and emergency equipment.

#### **6.0 REFERENCE MATERIAL**

29 CFR 1910.120, Hazardous Waste Operations and Emergency Response

SH&E SOP 401 – *Medical Surveillance Program* 

SH&E SOP 504 – Hazard Communications Program

#### 7.0 ATTACHMENTS

None

#### **8.0 REVISION HISTORY**

| Revision   | Date            | Change |
|------------|-----------------|--------|
| Original   | October 5, 2009 | N/A    |
| Revision 1 |                 |        |

|                          | ΔΕζΟΜ  | SH&E No.: | 716             |
|--------------------------|--|-----------|-----------------|
|                          | AECOM  | Rev:      | Original        |
| Drilling and Boring Work |  | Data      | October 5, 2000 |
| AE                       | COM Safety, Health and Environmental Procedure | Date.     | October 5, 2009 |

# 1.0 PURPOSE

Provides the minimum requirements to be followed when drilling and boring work are performed.

# 2.0 SCOPE

This procedure applies to all AECOM U.S.-based employees and operations.

#### 3.0 DEFINITIONS

None

#### 4.0 ROLES AND RESPONSIBILITIES

#### 4.1 SITE MANAGEMENT

**Project Manager** or Resident Engineer is responsible to see that sound principles of safety, training, inspection, maintenance and operation consistent with all resource data available from the manufacturer, OSHA, and ANSI is provided to the operator and users by the Contractor or operating entity.

Site Safety Coordinator (SSC) shall assist the Project Manager in compliance with the requirements of this procedure.

#### 4.2 SH&E DEPARTMENT

The SH&E Department shall assist site management with guidance about this procedure.

#### 4.3 ALL EMPLOYEES

AECOM employees engaged in project field activities shall be cognizant of contractor activities that may affect their safety and follow these procedures.

#### 4.4 AECOM EQUIPMENT OPERATOR

In cases where drilling and boring equipment is owned and operated by AECOM, the lead equipment operator is responsible for the maintenance and safe operation of equipment under their control consistent with those responsibilities of a Contractor.

#### 4.5 CONTRACTORS

Contractors have direct control over the application and operation of all drilling and boring equipment owned by their organization.

It is the Equipment Contractor operator's responsibility to implement safe work practices provided by the Contractor project management or supervision supplemented by good judgment, safe control, and caution whenever operating drilling and boring equipment.

Safety Representative – The Contractor's responsible person for safety for the drill crew will, in most cases, be the drill rig operator. The safety person's responsibilities are to:

- Consider the "responsibility" for safety and the "authority" to enforce safety to be a matter of first importance.
- Be the leader in using proper personal protective equipment and set an example in following the rules that are being enforced on others.
- Enforce the use of proper safety equipment and take appropriate corrective action when proper personal protective safety equipment is not being used.
- Understand that proper maintenance of tools and equipment and general "housekeeping" on the drill rig will provide the environment to promote and enforce safety.
- Ensure that the operator has had adequate training and is thoroughly familiar with the drill rig, its controls and its capabilities prior to commencement of drilling activities.
- Inspect the drill rig at least daily for structural damage, loose bolts and nuts, proper tension in chain drives, loose or missing guards or protective covers, fluid leaks, damaged hoses and/or damaged pressure gauges and pressure relief valves. A Drill Rig Inspection Form has been provided in Attachment 1 for use in performing inspections when the Contractor does not have their own.
- Check and test all safety devices such as emergency shutdown switches at least daily and preferably at the start of a drilling shift. Drilling should not be permitted until all emergency shutdown and warning systems are working correctly. Wiring around, bypassing or removal of an emergency device is not permitted.
- Check that all gauges, warning lights and control levers are functioning properly and listen for unusual sounds on each starting of an engine.
- Ensure that all new drill rig workers are informed of safe operating practices on and around the drill rig. Provide each new drill rig worker with a copy of the organization's drilling operations safety procedures and when appropriate, the drill rig manufacturer's operations and maintenance manual. The safety person should assure that each new employee reads and understands the safety procedures.
- Ensure first-aid kit and fire extinguishers are available and properly maintained on each drill rig and on each additional vehicle.
- Be well trained and capable of using first-aid kits, fire extinguisher and all other safety devices and equipment.
- Maintain a list of addresses and telephone numbers of emergency assistance units (ambulance services, police, hospitals, etc.) and inform other members of the drill crew of its location.
- See that new workers are instructed in drilling safety and observe the new worker's progress towards understanding safe operating practices.
- Observe the mental, emotional and physical capability of workers to perform the assigned work in a proper and safe manner. Dismiss any worker from the drill site whose mental and physical capabilities might cause injury to the worker or co-workers.
- Drilling Crew and Other Field Personnel Those employees involved in fieldwork. All personnel engaged in site activities are required to become thoroughly familiar with, and to conform to, the provisions of AECOM's safety plan, procedures, and such other safety directives as may be considered appropriate by Project Managers, Safety Officers, and Supervisors.
- Drill Rig Workers Personnel are encouraged to offer ideas, suggestions or recommendations regarding any operational condition, procedure or practice, that may enhance the safety of site personnel or the public. Their primary responsibilities will be:
  - Perform all required work safely.
  - Familiarize them selves with and understand the plan, including proper use of personal protective equipment.
  - Report any unsafe conditions to supervisory personnel.

 $\circ$  Be aware of signs and symptoms of thermal stress.

#### 5.0 PROCEDURE

#### 5.1 PERSONAL PROTECTIVE EQUIPMENT

- For most geotechnical, mineral and/or groundwater drilling projects, individual personal protective equipment should include:
  - Hard hat Hard hats shall be worn by everyone working at a drilling/boring site. Hats should meet the requirements of ANSI Z89 and be kept clean and in good repair with the headband and crown straps properly adjusted for the employee.
  - Safety shoes Safety shoes or boots shall be worn by all drilling personnel and all visitors to the drill site that observe drilling operations within close proximity of the drill rig. Safety shoes or boots should meet the requirements of ANSI Z4 1.1.
  - Safety glasses All drilling personnel shall wear safety glasses meeting the requirements of ANSI Z87.1.
  - High Visibility Class II Safety Vest shall be worn by all AECOM employees.
  - Close fitting gloves and clothing All drilling personnel should wear gloves for hand protection against cuts and abrasions which could occur while handling wire rope or cable and from contact with sharp edges and burrs on drill rods and other drilling or sampling tools. Gloves should be close fitting and not have large cuffs or loose ties which can catch on rotating or translating components of the drill rig.
- Other protective equipment For some drilling operations, the project may dictate use of other protective equipment. The management of the drilling contractor and its safety person must determine the requirements. Such equipment might include face or ear protection or reflective clothing. The design and composition of the protective equipment and clothing should be determined as a joint effort of management and the client.
- Each drill rig worker should wear noise reducing ear protectors around equipment based on noise levels.
- When drilling is performed in chemically or radiological contaminated ground, special protective equipment and clothing will probably be required.
- The clothing of the individual drill rig worker is not generally considered protective equipment; however, clothing should be close fitting and comfortable without loose ends, straps, draw strings or belts or otherwise unfastened parts that might catch on some rotating or translating component of the drill rig. Rings and jewelry should not be worn during a work shift.

#### 5.2 HOUSEKEEPING

A key requirement for safe field operations is that the Contractor safety person understands and fulfills the responsibility for maintenance and "housekeeping" on and around the drill rig, including the following:

- Suitable storage locations should be provided for all tools, materials and supplies so that tools, materials and supplies can be conveniently and safely handled without hitting or falling on a member of the drill crew or a visitor.
- Storage or transporting tools, materials or supplies within or on the mast (derrick) of the drill rig should be avoided.
- Pipe, drill rods, casing augers and similar drilling tools should be orderly stacked on racks or sills to prevent spreading, rolling or sliding.
- Penetration or other driving hammers should be placed at a safe location on the ground or be secured to prevent movement when not in use.
- Work areas, platforms, walkways, scaffolding and other accesses should be kept free of materials, debris
  and obstructions and substances such as ice, grease or oil that could cause a surface to become slick or
  otherwise hazardous.
- All controls, control linkages, warning and operation lights and lenses should be kept free of oil, grease and/or ice.
- Do not store gasoline in any portable container other than a non-sparking, red safety container with a flame arrester in the fill spout and having the word "gasoline" easily visible.

#### 5.3 TRAFFIC CONTROL

The Contractor responsible for the operator of the drilling and boring rig near public vehicular and pedestrian traffic shall take every precaution necessary to see that the work zone is properly established, identified and isolated from both moving traffic and passerby pedestrians.

All traffic control devices shall be installed, placed and maintained by the Contractor in accordance with the Traffic Control Plan, client specifications and the Manual of Uniform Traffic Control Devices (MUTCD). Traffic control devices shall consist of and not be limited to:

- Directional and informational signage;
- Barricades, cones or barrels consistent with the site;
- Lighting; and
- Other equipment and devices as required.

## 5.4 MAINTENANCE & INSPECTION

Good maintenance and thorough inspection will make drilling operations safer. Also, maintenance tasks should be done safely by a qualified maintenance person. Inspection and maintenance tasks include, but are not limited to:

- Inspections shall be completed at the beginning of each day by the equipment operator and in the presence of an AECOM employee when the equipment is not owned and operated by AECOM. A Drill Rig Inspection Form is provided in Attachment A for use in performing inspections.
- Safety glasses should be worn when performing maintenance on a drill rig or on drilling tools.
- The drill rig engine should be shut down to make repairs or adjustments to a drill rig or to lubricate fittings (except repairs or adjustments that can only be made with the engine running).
- Precautions should be taken to prevent accidental starting of an engine during maintenance by removing or tagging the ignition key.
- Wheels or the lowering of leveling jacks or both should be blocked ("zero energy state") and hand brakes set before working under a drill rig.
- When possible and appropriate, all pressure on the hydraulic systems should be released as well as the drilling fluid system and the air pressure systems of the drill rig prior to performing maintenance. In other words, reduce the drill rig and operating systems to a "zero energy state" before performing maintenance. Use extreme caution when opening drain plugs and radiator caps and other pressurized plugs and caps.
- Personnel shall not touch an engine or the exhaust system of an engine following its operation until the engine and exhaust system have adequate time to cool.
- Welding and cutting shall not occur on or near a fuel tank.

- Wire rope safety factors shall be in accordance with American National Standards Institute B 30.5-1968 or SAE J959-1966.
- Gasoline or other volatile or flammable liquids shall not be used as a cleaning agent on or around a drill rig.
- The manufacturer's recommendations should be followed for applying the proper quantity and quality of lubricants, hydraulic oils and/or coolants.
- All caps, filler plugs, protective guards, panels, high-pressure hose clamps, chains or cables should be replaced that have been removed for maintenance.

#### 5.5 HAND TOOLS

There are almost an infinite number of hand tools that can be used on or around a drill rig and in repair shops and more than an equal number of instructions for proper use. "Use the tool for its intended purpose" is the most important rule. Additionally, equipment operators and assistants should not use their hand in place of the proper tool; work shall be stopped until the correct tool can be found. The following are a few specific and some general suggestions which apply to safe use of several hand tools that are often used on and around drill rigs:

- When a tool becomes damaged, either repair it before using it again or get rid of it.
- When using a hammer, any kind of hammer for any purpose, wear safety glasses and require all others around you to wear safety glasses.
- When using a chisel, any kind of chisel, for any purpose, wear safety glasses and require all others around you to wear safety glasses.
- Keep all tools cleaned and orderly stored when not in use.
- Use wrenches on nuts don't use pliers on nuts.
- Use screwdrivers with blades that fit the screw slot.
- When using a wrench on a tight nut first use some penetrating oil, use the largest wrench available that fits the nut, when possible pull on the wrench handle rather than pushing, and apply force to the wrench with both hands when possible and with both feet firmly placed. Don't push or pull with one or both feet on the drill rig or the side of a mud pit or some other blocking-off device. Always assume that you may lose your footing check the place where you may fall for sharp objects.
- Keep all pipe wrenches clean and in good repair. The jaws of pipe wrenches should be wire brushed frequently to prevent an accumulation of dirt and grease which would otherwise build up and cause wrenches to slip. Replace hook and heel jaws when they become visibly worn.
- Never use pipe wrenches in place of a rod-holding device.
- When breaking tool joints on the ground or on a drilling platform, position your hands so that your fingers will not be smashed between the wrench handle and the ground or the platform, should the wrench slip or the joint suddenly let go.

#### 5.6 CLEARING WORK AREAS

Prior to drilling, adequate site clearing and leveling should be performed to accommodate the drill rig and supplies and provide a safe working area. Clearing the site includes clearing the intended drilling area of underground utilities in accordance with SH&E SOP 803 – *Identifying Underground Utilities*. Drilling should not be commenced when tree limbs, unstable ground or site obstructions cause unsafe tool handling conditions.

#### 5.6.1 Start-Up

• All drill rig personnel and visitors should be instructed to "stand clear" of the drill rig immediately prior to and during starting of an engine.



- Make sure all gear boxes are in neutral, all hoist levers are disengaged, all hydraulic levers are in the neutral-actuating positions and the cathead rope is not on the cathead before starting a drill rig engine.
- Start all engines according to the manufacturer's manual.

### 5.6.2 Drilling Operations

Safety requires the attention and cooperation of every worker and site visitor.

- Do not drive the drill rig from hole to hole with the mast (derrick) in the raised position.
- Before raising the mast (derrick) look up to check for overhead obstructions. Refer to SH&E SOP 726 Identifying Underground Utilities and SHE SOP 727 – Overhead Electrical Lines.
- Before raising the mast (derrick), all drill rig personnel (with the exception of the operator) and visitors should be cleared from the areas immediately to the rear and the sides of the mast. All drill rig personnel and visitors should be informed that the mast is being raised prior to raising it.
- Before the mast (derrick) of a drill rig is raised and drilling is commenced, the drill rig must be first leveled and stabilized with leveling jacks and/or solid cribbing. The drill rig should be reveled if it settles after initial set up. Lower the mast (derrick) only when the leveling jacks are down and do not raise the leveling jack pads until the mast (derrick) is lowered completely.
- Before starting drilling operations, secure and/or lock the mast (derrick) if required according to the drill manufacturer's recommendations.
- The operator of a drill rig should only operate a drill rig from the position of the controls. If the operator of the drill rig must leave the area of the controls, the operator should shift the transmission controlling the rotary drive into neutral and place the feed control lever in neutral. The operator should shut down the drill engine before leaving the vicinity of the drill.
- Throwing or dropping tools will not be permitted. All tools should be carefully passed by hand between personnel or a hoist line should be used.
- Do not consume alcoholic beverages or other depressants or chemical stimulants prior to starting work on a drill rig or while on the job.
- If it is necessary to drill within an enclosed area, make certain that exhaust fumes are conducted out of the area. Exhaust fumes can be toxic and some cannot be detected by smell.
- Clean mud and grease from your boots before mounting a drill platform and use hand holds and railings. Watch for slippery ground when dismounting from the platform.
- During freezing weather, do not touch any metal parts of the drill rig with exposed flesh. Freezing of moist skin to metal can occur almost instantaneously.
- All air and water lines and pumps should be drained when not in use if freezing weather is expected.
- All unattended bore holes must be adequately covered or otherwise protected to prevent drill rig
  personnel, site visitors or animals from stepping or falling into the hole. All open bore holes should be
  covered, protected or backfilled adequately and according to local or state regulations on completion of
  the drilling project.

- "Horsing around" within the vicinity of the drill rig and tool and supply storage areas should never be allowed, even when the drill rig is shut down.
- When using a ladder on a drill rig, face the ladder and grasp either the side rails or the rungs with both hands while ascending or descending. Always use adequate fall protection and a full body harness when climbing above six feet of the ground. Do not attempt to use one or both hands to carry a tool while on a ladder. Use a hoist line and a tool "bucket" or a safety hook to raise or lower hand tools.

#### 5.6.3 Elevated Derrick Platforms

The following precautions should be used:

- When working on a derrick platform, use a full body harness and fall protection. The harness should fit snugly but comfortably. The lifeline when attached to the derrick should be less than 6 feet (2 m) long and attached to a fall arrester. The harness and lifeline should be strong enough to withstand the dynamic force of a 250-pound (115 kg) weight (contained within the belt) falling 6 feet (2 m).
- When climbing to a derrick platform that is higher than 6 feet (am), a fall arresting device must be used.
- When a rig worker is on a derrick platform, the lifeline should be fastened to the derrick just above the derrick platform and to a structural member that is not attached to the platform or to other lines or cables supporting the platform.
- When a rig worker first arrives at a derrick platform, the platform should immediately be inspected for broken members, loose connections and loose tools or other loose materials.
- Tools should be securely attached to the platform with safety lines. Do not attach a tool to a line attached to your wrist or any other part of your body.
- When you are working on a derrick platform, do not guide drill rods or pipe into racks or other supports by taking hold of a moving hoist line or a traveling block.
- Loose tools and similar items should not be left on the derrick platform or on structural members of the derrick.
- A derrick platform over 4 feet (1.2 m) above ground surface should have toe boards and safety railings that are in good condition.
- Workers on the ground or the drilling floor should avoid being under rig workers on elevated platforms, whenever possible.

#### 5.6.4 Lifting Heavy Objects

- Before lifting any object without using a hoist, make sure that the load is within your personal lifting capacity. If it is too heavy, ask for assistance.
- Before lifting a relatively heavy object, approach the object by bending at the knees, keeping your back vertical and un-arched while obtaining a firm footing. Grasp the object firmly with both hands and stand slowly and squarely while keeping your back vertical and un-arched. In other words, perform the lifting with the muscles in your legs, not with the muscles in your lower back.
- If a heavy object must be moved some distance without the aid of machinery, keep your back straight and un-arched. Change directions by moving your feet, not by twisting your body.



• Move heavy objects with the aid of handcarts or lifting devices whenever possible.

Drilling operations will be terminated during an electrical storm and all crew members will move away from the rig. If lightning is observed, shutdown all rig operations immediately.

#### 5.6.5 Use of Wire Line Hoists, Wire Rope and Hoisting Hardware

The use of wire line hoists, wire rope and hoisting hardware should be as stipulated by the American Iron Steel Institute, Wire Rope Users Manual.

- All wire ropes and fittings should be visually inspected during use and thoroughly inspected at least once a week for: abrasion, broken wires, wear, reduction in rope diameter, reduction in wire diameter, fatigue, corrosion, damage from heat, improper revving, jamming, crushing, bird caging, kinking, care protrusion and damage to lifting hardware. Wire ropes should be replaced when inspection indicates excessive damage according to the Wire Rope Users Manual. All wire ropes that have not been used for a period of a month or more should be thoroughly inspected before being returned to service.
- End fittings and connections consist of spliced eyes and various manufactured devices. All manufactured end fittings and connections should be installed according to the manufacturer's instructions and loaded according to the manufacturer's specifications.
- If a ball-bearing type hoisting swivel is used to hoist drill rods, swivel bearings should be inspected and lubricated daily to assure that the swivel freely rotates under load.
- If a rod-slipping device is used to hoist drill rods, do not drill through or rotate drill rods through the slipping device; do not hoist more than 1 foot (.3 m) of the drill rod column above the top of the mast (derrick); and, do not hoist a rod column with loose tool joints while the rod column is being supported by a rod slipping device. If drill rods should slip back into the bore hole, do not attempt to break the fall of the rods with your hands or by applying tension to the slipping device.
- Most sheaves on exploration drill rigs are stationary with a single part line. The number of parts of line should never be increased without first consulting with the manufacturer of the drill rig.
- Wire ropes must be properly matched with each sheave if the rope is too large, the sheave will pinch the wire rope if the rope is too small, it will groove the sheave. Once the sheave is grooved, it will severely pinch and damage larger-sized wire ropes and therefore must be replaced.

The following procedures and precautions must be understood and implemented for safe use of wire ropes and rigging hardware.

- Use tool-handling hoists only for vertical lifting of tools (except when angle hole drilling). Do not use toolhandling hoists to pull on objects always from the drill rig; however, drills may be moved using the main hoist if the wire rope is spooled through proper sheaves according to the manufacturer's recommendations.
- When struck tools or similar loads cannot be raised with a hoist, disconnect the hoist line and connect the stuck tools directly to the feed mechanism of the drill. Do not use hydraulic leveling jacks for added pull to the hoist line or the feed mechanism of the drill.
- When attempting to pull out a mired down vehicle or drill rig carrier, only use a winch on the front or rear of the vehicle and stay as far as possible away from the wire rope. Do not attempt to use tool hoists to pull out a mired down vehicle or drill rig carrier.
- Minimize shock loading of a wire rope apply loads smoothly and steadily. Avoid sudden loading in cold weather.

- Never use frozen ropes.
- Protect wire rope from sharp corners or edges.
- Replace faulty guides and rollers.
- Replace damaged safety latches on safety hooks before using.
- Know the safe working load of the equipment and tackle being used. Never exceed this limit.
- Clutches and brakes of hoists should be periodically inspected and tested.
- Know and do not exceed the rated capacity of hooks, rings, links, swivels, shackles and other lifting aids.
- Always wear gloves when handling wire ropes.
- Do not guide wire rope on hoist drums with your hands.
- Following the installation of a new wire rope, first lift a light load to allow the wire rope to adjust.
- Never carry out any hoisting operations when the weather conditions are such that hazards to personnel, the public or property are created.
- Never leave a load suspended in the air when the hoist is unattended.
- Keep your hands away from hoists, wire rope, hoisting hooks, sheaves and pinch points as slack is being taken up and when the load is being hoisted.
- Never hoist the load over the head, body or feet of any personnel. Never use a hoist line to "ride" up the mast (derrick) of a drill rig.
- Replacement wire ropes should conform to the drill rig manufacturer's specifications.

## 5.6.6 Use of Cathead and Rope Hoists

The following safety procedures should be employed when using a cathead hoist.

- Keep the cathead clean and free of rust and oil and/or grease. The cathead should be cleaned with a wire brush if it becomes rusty.
- Check the cathead periodically, when the engine is not running, for rope wear grooves. If a rope groove forms to a depth greater than 1/8 inches (3 mm), the cathead should be replaced.
- Always use a clean, dry, sound rope. A wet or oily rope may "grab" the cathead and cause drill tools or other items to be rapidly hoisted to the top of the mast.
- Should the rope "grab" the cathead or otherwise become tangled in the drum, release the rope and sound an appropriate alarm for all personnel to rapidly back away and stay clear. The operator should also back away and stay clear. If the rope "grabs" the cathead, and tools are hoisted to the sheaves at the top of the mast, the rope will often break, releasing the tools. If the rope does not break, stay clear of the drill rig until the operator cautiously returns to turn off the drill rig engine and appropriate action is taken to release the tools. The operator should keep careful watch on the suspended tools and should quickly back away after turning off the engine.



- The rope should always be protected from contact with all chemicals. Chemicals can cause deterioration of the rope that may not be visibly detectable.
- Never wrap the rope from the cathead (or any other rope, wire rope or cable on the drill rig) around a hand, wrist, arm, foot, ankle, leg or any other part of your body.
- Always maintain a minimum of 18 inches of clearance between the operating hand and the cathead drum when driving samplers, casing or other tools with the cathead and rope method. Be aware that the rope advances toward the cathead with each hammer blow as the sampler or other drilling tool advances into the ground.
- Never operate a cathead (or perform any other task around a drill rig) with loose unbuttoned or otherwise unfastened clothing or when wearing gloves with large cuffs or loose straps or lacings.
- Do not use a rope that is any longer than necessary. A rope that is too long can form a ground loop or otherwise become entangled with the operator's legs.
- Do not use more rope wraps than are required to hoist a load.
- Do not leave a cathead unattended with the rope wrapped on the drum. Position all other hoist lines to prevent contact with the operating cathead rope.
- When using the cathead and rope for driving or back driving, make sure that all threaded connections are tight and stay as far away as possible from the hammer impact point.
- The cathead operator must be able to operate the cathead standing on a level surface with good, firm footing conditions without distraction or disturbance.

#### 5.6.7 Use of Augers

The following general procedures should be used when starting a boring with continuous flight of hollow-stem augers:

- Prepare to start an auger boring with the drill rig level, the clutch or hydraulic rotation control disengaged, the transmission in low gear, and the engine running at low RPM.
- Apply an adequate amount of down pressure prior to rotation to seat the auger head below the ground surface.
- Look at the auger head while slowly engaging the clutch or rotation control and starting rotation. Stay clear of the auger.
- Slowly rotate the auger and auger head while continuing to apply down pressure. Keep one hand on the clutch or the rotation control at all times until the auger has penetrated about one foot or more below ground surface.
- If the auger head slides out of alignment, disengage the clutch or hydraulic rotation control and repeat the hole starting process.
- An auger guide can facilitate the starting of a straight hole through hard ground or a pavement.
- The operator and tool handler should establish a system of responsibility for the series of various activities required for auger drilling, such as connecting and disconnection auger sections, and inserting

and removing the auger fork. The operator must assure that the tool handler is well away from the auger column and that the auger fork is removed before starting rotation.

- Only use the manufacturer's recommended method of securing the auger to the power coupling. Do not touch the coupling or the auger with your hands, a wrench or any other tools during rotation.
- Whenever possible, use tool hoists to handle auger sections.
- Never place hands or fingers under the bottom of an auger section when hoisting the auger over the top of the auger section in the ground or other hard surfaces such as the drill rig platform.
- Never allow feet to get under the auger section that is being hoisted.
- When rotating augers, stay clear of the rotating auger and other rotating components of the drill rig. Never reach behind or around a rotating auger for any reason.
- Use a long-handled shovel to move auger cuttings away from the auger. Never use your hands or feet to move cuttings away from the auger.
- Do not attempt to remove earth from rotating augers. Augers should be cleaned only when the drill rig is in neutral and the augers are stopped from rotating.

#### 5.6.8 Rotary and Core Drilling

- Rotary drilling tools should be safety checked prior to drilling:
  - Water swivels and hoisting plugs should be lubricated and checked for "frozen" bearings before use.
  - Drill rod chuck jaws should be checked periodically and replaced when necessary.
  - The capacities of hoists and sheaves should be checked against the anticipated weight to the drill rod string plus other expected hoisting loads.
- Special precautions that should be taken for safe rotary or core drilling involve chucking, joint break, hoisting and lowering of drill rods:
  - Only the operator of the drill rig should brake or set a manual chuck so that rotation of the chuck will
    not occur prior to removing the wrench from the chuck.
  - Drill rods should not be braked during lowering into the hole with drill rod chuck jaws. Drill rods should not be held or lowered into the hole with pipe wrenches.
  - If a string of drill rods are accidentally or inadvertently released into the hole, do not attempt to grab the falling rods with your hands or a wrench.
  - In the event of a plugged bit or other circulation blockage, the high pressure in the piping and hose between the pump and the obstruction should be relieved or bled down before breaking the first tool joint.
  - When drill rods are hoisted from the hole, they should be cleaned for safe handling with a rubber or other suitable rod wiper. Do not use your hands to clean drilling fluids from drill rods.
  - If work must progress over a portable drilling fluid (mud) pit, do not attempt to stand on narrow sides or cross members. The mud pit should be equipped with rough-surfaced, fitted cover panels of adequate strength to hold drill rig personnel.
  - Drill rods should not be lifted and leaned unsecured against the mast. Either provide some method of securing the upper ends of the drill rod sections for safe vertical storage or lay the rods down.

#### 5.7 SITE MOVEMENT OF EQUIPMENT

The individual who transports a drill rig on and off a drilling site should:

- Be properly licensed and should only operate the vehicle according to federal, state and local regulations.
- Know the traveling height (overhead clearance), width, length and weight of the drill rig with carrier and know highway and bridge load, width and overhead limits, making sure these limits are not exceeded with and adequate margin.
- Never move a drill rig unless the vehicle brakes are in sound working order.
- Allow for mast overhand when cornering or approaching other vehicles or structures.
- Be aware that the canopies of service stations and motels are often too low for a drill rig mast to clear with the mast in the travel position.
- Watch for low hanging electrical lines, particularly at the entrances to drilling sites or restaurants, motels other commercial sites.
- Never travel on a street, road, highway with the mast (derrick) of the drill rig in the raised or partially raised position.
- Remove all ignition keys if rig is left unattended.

#### 5.7.1 Loading and Unloading

- Use ramps of adequate design that are solid and substantial enough to bear the weight of the drill rig with carrier including tools.
- Load and unload on level ground.
- Use the assistance of someone on the ground as a guide.
- Check the brakes on the drill rig carrier before approaching loading ramps.
- Distribute the weight of the drill rig, carrier and tools on the trailer so that the center of eight is approximately on the centerline of the trailer and so that some of the trailer load is transferred to the high of the pulling vehicle. Refer to the trailer manufacturer's weight distribution recommendations.
- The drill rig and tools should be secured to the hauling vehicle with ties, chains and/or load binders of adequate capacity.

#### 5.7.2 Off-Road Movement

The following safety suggestions relate to off-road movement:

- Before moving a drill rig, first walk the route of travel, inspecting for depressions, stumps, gullies, ruts and similar obstacles.
- Always check the brakes of a drill rig carrier before traveling, particularly on rough, uneven or hilly ground.
- Check the complete drive train of a carrier at least weekly for loose or damaged bolts, nuts, studs, shafts and mountings.

- Discharge all passengers before moving a drill rig on rough or hilly terrain.
- Engage the front axle (for 4 x 4, 6 x 6, etc. vehicles or carriers) when traveling off highway on hilly terrain.
- Use caution when traveling side-hill. Conservatively evaluate side-hill capability of drill rigs, because the arbitrary addition of drilling tools may raise the center of mass. When possible, travel directly uphill or downhill. Increase tire pressures before traveling in hilly terrain (do not exceed rated tire pressure).
- Attempt to cross obstacles such as small logs and small erosion channels or ditches squarely, not at an angle.
- Use the assistance of someone on the ground as a guide when lateral or overhead clearance is close.
- After the drill has been moved to a new drilling site, set all brakes and/or locks. Always block/chock the wheels.

#### 5.7.3 Tires, Batteries and Fuel

- Tires on the drill rig must be checked daily for safety and during extended travel for loss of air and they
  must be maintained and/or repaired in a safe manner. If tires are deflated to reduce ground pressure for
  movement on soft ground, the tires should be inflated to normal pressures before movement on firm or
  hilly ground or on streets, roads and highways. Under-inflated tires are not as stable on firm ground as
  properly inflated tires. Air pressures should be maintained for travel on streets, roads and highways
  according to the manufacturer's recommendations. During air pressure checks, inspect for:
  - Missing or loose wheel lugs.
  - Objects wedged between dual or embedded in the tire casing. Damaged or poorly fitting rims or rim flanges.
  - Abnormal wear, cuts, breaks or tears in the casing.
  - The repair of truck and off-highway tires should only be made with required special tools and following the recommendations of a tire manufacturer's repair manual.
- Batteries contain strong acid. Use extreme caution when servicing batteries.
- Batteries should only be serviced in a ventilated area while wearing safety glasses.
- When a battery is removed from a vehicle or service unit, disconnect the battery ground clamp first.
- When installing a battery, connect the battery ground clamp last.
- When charging a battery with a battery charger, turn off the power source to the battery before either connecting or disconnecting charger leads to the battery posts. Cell caps should be loosened prior to charging to permit the escape of gas.
- Spilled battery acid can burn your skin and damage your eyes. Spilled battery acid should be immediately flushed off of your skin with lots of water. Should battery acid get into someone's eyes, flush immediately with large amounts of water and see a physician at once.
- To avoid battery explosions, keep the cells filled with electrolyte; use a flashlight (not an open flame) to check electrolyte levels and avoid creating sparks around the battery by shorting across a battery terminal. Keep lighted smoking materials and flames away from batteries.

#### SH&E 716: Drilling and Boring

Special precautions must be taken for handling fuel and refueling the drill rig or carrier. Only use the type and quality of fuel recommended by the engine manufacturer.

- Refuel in a well-ventilated area.
- Do not fill fuel tanks while the engine is running. Turn off all electrical switches. Do not spill fuel on hot surfaces. Clean any spillage before starting an engine. Wipe up spilled fuel with cotton rags or cloths do not use wool or metallic cloth.
- Keep open lights, lighted smoking materials and flames or sparking equipment well away from the fueling area.
- Turn off heaters in carrier cabs when refueling the carrier or the drill rig.
- Do not fill portable fuel containers completely full to allow expansion of the fuel during temperature changes.
- Keep the fuel nozzle in contact with the tank being filled to prevent static sparks from igniting the fuel.
- Do not transport portable fuel containers in the vehicle or carrier cab with personnel.
- Fuel containers and hoses should remain in contact with a metal surface during travel to prevent the buildup of static charge.

#### 5.8 FIRST AID (SEE SH&E SOP 405 RELATING TO MEDICAL SERVICES AND FIRST AID)

- At least one member of the drill crew, and if only one preferably the drilling and safety supervisor, should be trained to perform first aid. First aid is taught on a person-to-person basis, not by providing or reading a manual. Manuals should only provide continuing reminders and be used for reference. It is suggested that courses provided or sponsored by the American Red Cross or a similar organization would best satisfy the requirements of first aid training for drill crews.
- For drilling operations it is particularly important that the individual responsible for first aid should be able to recognize the symptoms and be able to provide first aid for electrical shock, heart attack, stroke, broken bones, eye injury, snake bite and cuts or abrasions to the skin. Again, first aid for these situations is best taught to drill crewmembers by instructors qualified by an agency such as the American Red Cross.
- A first aid kit should be available and well maintained on each drill site. The contents of the first aid kit shall be placed in a weatherproof container with individual sealed packages for each type of item.

#### 5.9 DRILL RIG UTILIZATION

- Do not attempt to exceed manufacturers' ratings of speed, force, torque, pressure, flow, etc.
- Only use the drill rig and tools for the purposes that they are intended and designed.

#### 5.9.1 Drill Rig Alterations

Alterations to a drill rig or drilling tools should only be made by qualified personnel and only after consultation with the manufacturer.

## 6.0 REFERENCE MATERIAL

SH&E SOP 726 – Identifying Underground Utilities SH&E SOP 727 – Overhead Electrical Lines Drilling Safety Guide, National Drilling Federation, 1985.

## 7.0 ATTACHMENTS

Attachment 1 – Drill Rig Inspection Form

Attachment 2 – Subsurface Investigation Checklist

## **8.0 REVISION HISTORY**

| Revision   | Date            | Change |
|------------|-----------------|--------|
| Original   | October 5, 2009 | N/A    |
| Revision 1 |                 |        |

# **Drill Rig Inspection Form**

| Project Name: | Project Number:          |
|---------------|--------------------------|
| Date:         | Subcontractor Inspected: |

Site Manager:\_\_\_\_\_

| General Safety   |       |      |  |  |
|--|-------|------|--|--|
| Safety Officer Designated for Job:                         | □ Yes | □ No |  |  |
| Name:  |       |      |  |  |
| Safety Meeting Performed (Daily)                           | □ Yes | □ No |  |  |
| Personal Protective Equipment (                            | PPE)  |      |  |  |
| Hard Hats  | □ Yes | □ No |  |  |
| Safety Glasses   | □ Yes | □ No |  |  |
| Steel Toed Boots   | □ Yes | □ No |  |  |
| Hearing Protection   | □ Yes | □ No |  |  |
| Work Gloves  | □ Yes | □ No |  |  |
| Orange Work Vests  | □ Yes | □ No |  |  |
| Traffic Cones and Signs                                    | □ Yes | □ No |  |  |
| Other  | □ Yes | □ No |  |  |
| Disposal of PPE in Proper Waste Containers (if applicable) | □ Yes | □ No |  |  |
| Comments:  |       |      |  |  |
|  |       |      |  |  |
| Daily Inspections of Drill Rig                             | :     |      |  |  |
| Structural Damage, Loose Bolts                             | □ Yes | □ No |  |  |
| Proper Tension in Chain Drives                             | □ Yes | □ No |  |  |
| Loose or Missing Guards, Fluid Leaks                       | □ Yes | □ No |  |  |
| Damaged Hoses and/or Damaged Pressure                      | □ Yes | □ No |  |  |
| Gages and Pressure Relief Valves                           | □ Yes | □ No |  |  |
| Comments:  |       |      |  |  |

| CHECK AND TEST ALL SAFETY DEVICES SUCH AS:  |       |      |
|---|-------|------|
| Emergency shutdown switches, at least daily   | □ Yes | □ No |
| All gauges and warning lights, and ensure control levers are functioning properly     | □ Yes | □ No |
| First Aid and fire extinguishers on drill rig   | □ Yes | □ No |
| Back up alarm functioning properly  | □ Yes | □ No |
| Comments:   |       |      |
| DRILL CREW TRAINING REQUIREMENTS:   |       |      |
| 40-hour OSHA Training   | □ Yes | □ No |
| 8-hour Annual Refresher Training  | □ Yes | □ No |
| Drill Rig Training/Safe Operating Practices   | □ Yes | □ No |
| First Aid/CPR   | □ Yes | □ No |
| Emergency Procedures  | □ Yes | □ No |
| Emergency Phone Numbers Posted  | □ Yes | □ No |
| Site Orientation  | □ Yes | □ No |
| Health and Safety Plan Review   | □ Yes | □ No |
| Comments:   |       |      |
| HOUSEKEEPING:   |       |      |
| Suitable storage for tools, materials, and supplies                                   | □ Yes | □ No |
| Pipes, drill rods, casing, and augers stacked on racks to prevent rolling and sliding | □ Yes | □ No |
| Platforms and other work areas free of debris materials and obstructions              | □ Yes | □ No |
| Comments:   |       |      |

| HAND TOOLS:   |       |      |
|---|-------|------|
| Tools in good condition   | □ Yes | □ No |
| Broken tools discarded and replaced   | □ Yes | □ No |
| Right tool used for the right job   | □ Yes | □ No |
| Comments:   |       |      |
| DRILLING OPERATIONS:  |       |      |
| Mast or derrick down when moving rig  | □ Yes | □ No |
| Overhead obstructions identified before mast is raised  | □ Yes | □ No |
| Drill rig stabilized using leveling jacks or solid cribbing   | □ Yes | □ No |
| Secure and lock derrick   | □ Yes | □ No |
| OVERHEAD AND BURIED UTILITIES:  |       |      |
| Buried utilities identified and marked  | □ Yes | □ No |
| Safe distance of drill rig from overhead power lines  | □ Yes | □ No |
| Comments:   |       |      |
| WIRE LINE HOISTS, WIRE ROPE AND HARDWARE:   |       |      |
| Inspection for broken wires where reduction in rope diameter,<br>wire diameter, fatigue, corrosion, damage from gear jamming,<br>crushing, bird caging, kinking | □ Yes | □ No |
| Inspect and lubricate parts daily   | □ Yes | □ No |
| Comments:   |       |      |

#### Auger Operations - What to look for:

- A system of responsibility between the operator and the tool handler when connecting and disconnecting auger sections and inserting and removing auger fork.
- During connecting and disconnecting auger sections and inserting auger for the tool, handler should position himself away from the auger column while it is rotating.
- When securing the auger to the power coupling, pin should be inserted and tapped into place using a hammer or other similar device.
- Tool hoist should be used to lower second section of auger into place.
- Both operators should be clear of auger as it is being lifted into place.
- Long-handled shovel should be used to move dirt away from auger.

#### **Overall Summary:**

## SUBSURFACE INVESTIGATIONS CHECKLIST

|         | Name of Contractor:  |   |
|---------|--|---|
|         | Location:  | Project #:  |
| Date:   | Time:  | Weather:  |
|         | Person Conducting Inspection:  | Title:  |
| Note: A | Is you conduct your inspection you should any question is <b>NO,</b> this deficier | — be able to answer each question with a YES. If the answer to acy should be corrected as soon as possible. |
|         |  | $\sim$  |

|  |     | De<br>Co | ficien<br>rrecte | cy<br>d? |
|--|-----|----------|------------------|----------|
|  | YES | NO       | ок               | N/A      |
| <ol> <li>Do on-site personnel have required level PPE (steel toe boots,<br/>safety vests, hard hats, safety glasses, &amp; gloves)?</li> </ol>               |     |          |                  |          |
| 2. Is there a copy of HASP and EAP available at each drill rig location?   |     |          |                  |          |
| <ol><li>Are there a PID, multi-gas meter, and a colorimetric pump<br/>available at each drill rig location?</li></ol>  |     |          |                  |          |
| 4. HAS THE FIELD SCREENING EQUIPMENT BEEN CALIBRATED IN<br>THE MORNING?  |     |          |                  |          |
| 5. Are calibration gases available at the site?  |     |          |                  |          |
| 6. Are drilling fluids contained in the mud tub?   |     |          |                  |          |
| 6a.Does mud tub set-up provide adequate splash guards to protect public?   |     |          |                  |          |
| 6b.Does set-up present five (5) feet of walk space for public?   |     |          |                  |          |
| 6c. Will mud tub be emptied at end of day?   |     |          |                  |          |
| 6d. Explain how the mud tub will be covered to prevent an accident   |     |          |                  |          |
| 6e.Are adequate containment practices being implemented to prevent<br>mud tub liquids from being released to pedestrian walkways?                            |     |          |                  |          |
| <ol><li>Is the drill rig properly grounded?</li></ol>  |     |          |                  |          |
| 8. Is there a DOT permit available on-site at each drill rig location?   |     |          |                  |          |
| 8a. Are operations in compliance with DOT permit?  |     |          |                  |          |
| 9. Is there an orange snow fence with appropriate warning signage erected as a site barrier around the drill rig to keep-off the pedestrians from work area? |     |          |                  |          |
| 10. Are hydrant water hoses out of the pedestrian side walk?   |     |          |                  |          |

|  | YES | NO | ΟΚ | N/A |
|--|-----|----|----|-----|
| 11. Is there smoking and eating prohibited in the immediate work area?   |     |    |    |     |
| 12. Does each drill rig have a fire extinguisher, absorbent materials to cleanup a spill, and a first aid kit? |     |    |    |     |
| 13. Is the waste from mud tub properly contained into 55-gallon drums?   |     |    |    |     |
| 13a. Are drums properly labeled?   |     |    |    |     |
| 14. Is there proper housekeeping to avoid slips, trips, and falls?   |     |    |    |     |
| 15. Are decontamination/hand washing capabilities available at the site?                                       |     |    |    |     |
|  |     |    |    |     |

COMMENTS:

|  | AECOM | SH&E No.: | 721             |
|--|-------|-----------|-----------------|
|  |       | Rev:      | Original        |
| Competent Person Designation<br>AECOM Safety, Health and Environmental Procedure |       | Data      | October 5, 2009 |
|  |       | Date.     |                 |

## 1.0 PURPOSE

Outlines the process and minimum requirements necessary for classifying an AECOM employee as a "competent person" (competent person as defined by OSHA) in one or more activity areas:

- 1. Asbestos
- 2. Blasting & Explosives
- 3. Concrete & Masonry Construction
- 4. Confined Spaces
- Control of Hazardous Energy (Lockout-Tagout)
- 6. Cranes & Derricks
- 7. Demolition
- 8. Electrical Wiring Design & Protections
- 9. Excavations
- 10. Fall Protection
- 11. Hearing Protection

- 12. Heavy Equipment
- 13. Ionizing Radiation
- 14. Lead
- 15. Material Hoists & Personnel Hoists
- 16. Stairways & Ladders
- 17. Respiratory Protection
- 18. Rigging Equipment
- 19. Scaffolds
- 20. Steel Erection
- 21. Trench & Excavations
- 22. Underground Construction
- 23. Welding & Cutting

## 2.0 SCOPE

This procedure applies to all AECOM U.S.-based employees and operations where AECOM is self-performing the above activities and where AECOM controls projects performing the above activities requiring a competent person. Client-mandated requirements may apply on a project-specific basis and shall be addressed in supplemental documents (e.g. HASP).

## **3.0 DEFINITIONS**

**Competent Person** – One who is capable of identifying existing and predictable hazards in the surroundings or working conditions which are unsanitary, hazardous, or dangerous to employees, and who has authorization to take prompt corrective measures to eliminate them.

**HASP** – project Health and Safety Plan

## 4.0 ROLES AND RESPONSIBILITIES

A competent person in AECOM is an employee who functions in a supervisory role when either AECOM selfperforms associated field work (above) or oversees the work of contractors.

## 4.1.1 PROJECT MANAGER/FIELD TASK MANAGER/SUPERVISOR

Managers and Supervisors are responsible for ensuring that all assigned personnel, including personnel utilized from other offices to support their operations, comply with the requirements of this procedure. The Project Manager shall:

- Designate the Competent Person based on the work activity using Attachment 1, Competent Person Designation form
- Implement corrective actions when employees fail to meet training requirements

- Identify supplemental employee training needs based on local/client requirements
- Ensure competent person training requirements are reviewed with each employee, based upon current and anticipated job functions and past performance on a routine basis.
- Identify additional employees requiring competent person training based on this procedure
- For projects controlled by AECOM, when these activities are contracted to another party, the Project Manager shall secure the identity of Contractor's competent person(s).

#### 4.2 SH&E DEPARTMENT

The Regional SH&E Manager or designee will work with operations to assess the competency of all designated persons based on specific requirements outlined in this procedure. With the PM or designee determining the work-specific competent person, the Regional SH&E Manager provides guidance as needed. The SH&E Department (i.e., Regional SH&E Manager) with operations is responsible for:

- Establishing competent person training/experience requirements and communicating these requirements to line management
- Monitoring the overall implementation of this SOP
- Monitor field compliance of this procedure
- Providing technical assistance/support as requested by Regional and District managers
- Performing internal safety training classes as requested by Regional and District Managers
- Supporting PM in establishing minimum competent person requirements for regulated job activities (Section 1) based on individual job descriptions, applicable regulatory requirements, operational considerations, and management directives
- Review and approve as requested by designated operations representatives the competent person's qualifications for AECOM employees
- Develop and maintain a process to track employee training compliance and anniversary dates.

#### 4.3 AECOM COMPETENT PERSONS

Any AECOM employee considered for designation as a "competent person" shall, with their Supervisor under the guidance of the Regional SH&E Manager, complete a Training Needs Assessment (TNA) regarding competent persons requirements. Employees are also required to obtain approval from their Supervisor prior to enrolling in any AECOM-sponsored safety competent person training program. In addition, each employee is expected to track his or her own training anniversary dates and arrange for appropriate refresher training at least 30 days prior to expiration of certification.

The Designated Competent Person Form (Attachment I) shall be used on all projects for documenting Competent Person designations. It must be filled out completely and updated as necessary by the contractor.

#### 4.4 CONTRACTOR COMPETENT PERSONS

- Unless AECOM is self-performing, the Contractor is responsible for determining the safe means and methods of its work activities.
- The Contractor is responsible for designating its competent person(s) for each category of work it undertakes as required above.
- The Contractor's competent person is responsible for technically supporting the Contractor's site operations for the safe execution of its activities.
- The Contractor's competent person must be knowledgeable about the work activities, compliance with the associated safety and health regulations, identifying and removing any attendant field hazards and the Contractor's work practices and procedures.
- For work AECOM controls, the Project Manager shall see that the Contractor designates a competent person(s) for its activities. Attachment 1, Competent Person Designation form or the equivalent may be use for this purpose.

## 5.0 PROCEDURE

The AECOM competent person field functions are dependent on the project activities and AECOM's field function. Refer to each SH&E SOP for the activities listed above and associated OSHA standard to determine the details of responsibility. Generally, it is the competent person's responsibility to be onsite at all times when AECOM staff are performing work governed by this SOP, make daily inspections of the conditions and work activities, and take actions to control any hazards associated with those activities.

Documentation as to daily inspections and corrective measures by the AECOM competent persons shall be maintained in the project file.

## 6.0 REFERENCE MATERIAL

None

## 7.0 ATTACHMENTS

Attachment 1 – Competent Person Designation Form

## **8.0 REVISION HISTORY**

| Revision   | Date            | Change |
|------------|-----------------|--------|
| Original   | October 5, 2009 | N/A    |
| Revision 1 |                 |        |

| ATTACHMENT 1 : DESIGNATED                    | COMPE        | ENT PERSON   | J      |          |
|--|--------------|--------------|--------|----------|
| Project Location:                            | Job          | Number:      |        |          |
| Designated Competent Person:                 |              | ID Numb      | er:    |          |
| Check and provide name of Competent Person(s | s) next to e | ach activity |        |          |
| Asbestos                                     |              |              |        |          |
| Otner<br>(Explain)                           |              |              |        |          |
| Date: Designated                             | by:          | (Name,       | Title, | Company) |
|  |              |              |        |          |

|  | ΔΕζΟΜ |       | 727             |
|--|-------|-------|-----------------|
|  | AECOM | Rev:  | Original        |
| Overhead Electrical Lines                        |       | Deter | October 5, 2000 |
| AECOM Safety, Health and Environmental Procedure |       | Date. | October 5, 2009 |

## **1.0 PURPOSE**

Provides the safe work requirements to be observed where overhead power lines are present on a job site.

## 2.0 SCOPE

This procedure applies to all US AECOM-personnel and operations.

## 3.0 DEFINITIONS

None

## 4.0 ROLES AND RESPONSIBILITIES

None

## 5.0 PROCEDURE

Operation of heavy equipment and cranes in areas with overhead power lines represents a significant hazard to all personnel on the job site. Accidental contact with an energized line or arcing between a high power line and grounded equipment can cause electrocution of equipment operators or nearby ground personnel, and damage to power transmission and operating equipment. While maintaining a safe distance from all energized lines is the preferred means for control of this hazard, site conditions may not always accommodate this. If work will (or may) occur within 50 feet of any energized line, the procedures outlined below will be observed.

Overhead power lines will be identified on each job site before the work commences. For each identified line, the Project Manager must determine whether it is energized (and the operating voltage for energized lines), and whether work operations will require that activities with heavy equipment (excavators, loaders, cranes, etc.) will occur within 50 feet of the line. Unless verified, it will be assumed that all lines are energized.

Safe working distance is the minimum distance which must be maintained between any energized electrical line and any part of the operating equipment to maintain adequate safety margins, and is based on the line voltage of the power line. The following safe working distance criteria will be applied for all AECOM operations:

| Line Voltage (Kilovolts) | Minimum Safe Working Distance |
|--------------------------|-------------------------------|
| 0 – 50                   | 10 feet                       |
| >50 – 200                | 15 feet                       |
| >200 – 350               | 20 feet                       |
| >350 – 500               | 25 feet                       |
| >500 – 750               | 35 feet                       |
| >750 – 1000              | 45 feet                       |

Source: American National Standards Institute, Publication B30.5



#### 5.1 ACCEPTABLE SAFETY PROCEDURES

Where any work task will not allow the minimum safe working distance to be maintained at all times, an alternate means of protection must be identified and approved by the SH&E Department. In order of preference, acceptable procedures are:

- De-energize the power line(s)
- Install insulated sleeves on power lines
- Assign line spotters to assist the equipment operator

#### 5.1.1 De-Energize Power Lines

Elimination of electrical power provides the most acceptable means of ensuring safety of personnel. While temporary site power lines are under the control of the site manager (and can be de-energized locally), electrical distribution and transmission lines can be de-energized only by the owner of the line (generally the local electrical utility). Therefore, de-energizing of a line requires advance coordination with the line owner – generally at least one week advance notice should be provided.

#### 5.1.2 Install Insulating Sleeves

Insulating sleeves can be placed over power lines to provide a contact and arcing barrier if work must occur closer to the power lines than the accepted safe work distance. Although not as desirable as line de-energizing, the use of these sleeves can provide an acceptable alternative where electrical lines are required to remain in service.

As with de-energizing of distribution and transmission lines, placement of insulating sleeves can be performed only by the line owner. This requires advance coordination with the line owner – generally at least one week advance notice should be provided. To install the sleeves, representatives of the line owner will require access to the job site.

#### 5.1.3 Assign Line Spotters

A line spotter is a person located at ground level who is assigned to observe equipment operations, with the specific duty of assisting the equipment operator to ensure that no part of the equipment gets too close to an energized, unprotected electrical line.

Persons assigned to act as line spotters must meet the following requirements:

- While acting as a line spotter, no other duties may be performed (e.g., the line spotter cannot also act as the load spotter during a lifting operations).
- The spotter will have a radio or other direct means of communicating with the equipment operator at all times.
- The spotter will be positioned at a right angle to the equipment operator's line of sight to maximize the sight angles between the personnel.

Under no circumstances will any portion of a piece of equipment pass closer than 10 feet to any energized, un-insulated electrical line.

#### 5.2 ADDITIONAL SAFETY MEASURES

The following additional safety measures can be implemented as needed when working around energized power lines:

- <u>Provide equipment with proximity warning devices</u> These provide an audible alarm if any part of the equipment gets too close to a line.
- Install ground safety stops These prevent vehicles from accidentally entering hazardous areas.
- Equip cranes with a boom-cage guard This prevents the boom from becoming energized if an electrical line is contacted.

#### SH&E 727: Overhead Electrical Lines

• <u>Utilize insulated links and polypropylene tag lines</u> - These prevent transmission of electricity to loads or tag line handlers if an electrical line is contacted.

<u>NOTE:</u> These additional safeguards are intended as supplemental protection. Use of these measures is not permissible as a substitute for maintaining the safe working distance or implementation of the procedures in Section 4.1.

#### If an electrical power line is hit or an electrical arc occurs:

- All ground personnel must evacuate IMMEDIATELY to a distance of at least 50 feet. DO NOT attempt to rescue any injured person until the line can be de-energized.
- The operator should remain in the cab until the line can be de-energized, and carefully try to extricate the equipment from the power line. This may not be possible where melting of insulator material or metal has occurred.
- Contact the line owner to report the line contact and request that the line be de-energized immediately.
- Once the line has been confirmed to be de-energized, the operator can safely evacuate the cab and rescue can commence for any injured personnel.
- Contact the SH&E Department to report the incident and implement any instructions provided.

If the operator must evacuate while the line is still energized (due to fire or other life-threatening condition) he/she should jump clear of the equipment (<u>making sure</u> to avoid touching the equipment and the ground simultaneously), and land upright and with feet together. Once on the ground, proceed in a direct line away from the equipment using a short, shuffling gait (feet touching, sliding each foot no more than 1 foot forward at a time) to minimize shock hazard from electrical energy being transmitted through the ground.

## 6.0 REFERENCE MATERIAL

SH&E SOP 601 – General Electrical Safety

SH&E SOP 712 – Hazardous Energy Control (Lockout-Tagout)

## 7.0 ATTACHMENTS

None

## **8.0 REVISION HISTORY**

| Revision   | Date            | Change |
|------------|-----------------|--------|
| Original   | October 5, 2009 | N/A    |
| Revision 1 |                 |        |

AECOM Job No. 60138541

Health and Safety Plan Cintas-Former RUS

## Attachment E – Safety Certifications, Field Forms, & Material Safety Data Sheets

# **Drill Rig Inspection Form**

| Project Name: | Project Number:          |
|---------------|--------------------------|
| Date:         | Subcontractor Inspected: |

Site Manager:\_\_\_\_\_

| General Safety   |   | and and an an an and an and an and an and an |
|--|---|--|
| Safety Officer Designated for Job:                         | □ Yes   | 🗆 No   |
| Name:  |   |  |
| Safety Meeting Performed (Daily)                           | □ Yes   | □ No   |
| Personal Protective Equipment (F                           | PPE)  |  |
| Hard Hats  | □ Yes   | □ No   |
| Safety Glasses   | □ Yes   | □ No   |
| Steel Toed Boots   | □ Yes   | 🗆 No   |
| Hearing Protection   | □ Yes   | 🗆 No   |
| Work Gloves  | □ Yes   | □ No   |
| Orange Work Vests  | 🗆 Yes   | □ No   |
| Traffic Cones and Signs                                    | 🗆 Yes   | □ No   |
| Other  | □ Yes   | □ No   |
| Disposal of PPE in Proper Waste Containers (if applicable) | 🗆 Yes   | □ No   |
| Comments:  |   |  |
|  | an a  |  |
| Daily inspections of Drill Rig:                            |   |  |
| Structural Damage, Loose Bolts                             |   | □ No   |
| Proper Tension in Chain Drives                             | □ Yes   | □ No   |
| Loose or Missing Guards, Fluid Leaks                       | □ Yes   | 🗆 No   |
| Damaged Hoses and/or Damaged Pressure                      | 🗆 Yes   | □ No   |
| Gages and Pressure Relief Valves                           | 🗆 Yes   | □ No   |
| Comments:  | 107 A 4779 A 478 A 478 A 479 A 47 |  |

| Emergency shutdown switches, at least daily   | □ Yes  | 🗆 No |
|---|--|------|
| All gauges and warning lights, and ensure control levers are functioning properly     | □ Yes  | 🗆 No |
| First Aid and fire extinguishers on drill rig   | □ Yes  | 🗆 No |
| Back up alarm functioning properly  | □ Yes  | 🗆 No |
| Comments:   |  |      |
| DRILL CREW TRAINING REQUIREMENTS:   |  |      |
| 40-hour OSHA Training   | □ Yes  | 🗆 No |
| 8-hour Annual Refresher Training  | □ Yes  | 🗆 No |
| Drill Rig Training/Safe Operating Practices   | □ Yes  | 🗆 No |
| First Aid/CPR   | □ Yes  | 🗆 No |
| Emergency Procedures  | □ Yes  | 🗆 No |
| Emergency Phone Numbers Posted  | □ Yes  | 🗆 No |
| Site Orientation  | □ Yes  | 🗆 No |
| Health and Safety Plan Review   | □ Yes  | □ No |
| Comments:   |  |      |
| HOUSEKEEPING:   |  |      |
| Suitable storage for tools, materials, and supplies                                   | □ Yes  | 🗆 No |
| Pipes, drill rods, casing, and augers stacked on racks to prevent rolling and sliding | □ Yes  | 🗆 No |
| Platforms and other work areas free of debris materials and                           | □ Yes  | □ No |
| obstructions  | and the second |      |

| c.  |  |  |
|---|--|--|
| HAND TOOLS:   |  |  |
| Tools in good condition   | □ Yes                                    | 🗆 No   |
| Broken tools discarded and replaced   | □ Yes                                    | 🗆 No   |
| Right tool used for the right job   | □ Yes                                    | 🗆 No   |
| Comments:   |  |  |
|   |  |  |
|   | aana ay ay garta ah                      |  |
| DRILLING OPERATIONS:  |  |  |
| Mast or derrick down when moving rig  |  |  |
| Overhead obstructions identified before mast is raised  | □ Yes                                    | □ No   |
| Drill rig stabilized using leveling jacks or solid cribbing   | □ Yes                                    | 🗆 No   |
| Secure and lock derrick   | □ Yes                                    | 🗆 No   |
| Contributes.  |  |  |
|   |  |  |
| OVERHEAD AND BURIED UTILITIES:  |  |  |
| Buried utilities identified and marked  | □ Yes                                    | 🗆 No   |
| Safe distance of drill rig from overhead power lines  | □ Yes                                    | □ No   |
| Comments:   |  | · · · · · · · · · · · · · · · · · · ·  |
|   |  |  |
|   |  | den vinnen med men in die metzen. Die ofder ein die staar die verste die aan die die beseer                      |
| WIRE LINE HOISTS, WIRE ROPE AND HARDWARE:   |  |  |
| Inspection for broken wires where reduction in rope diameter,<br>wire diameter, fatigue, corrosion, damage from gear jamming,<br>crushing, bird caging, kinking | □ Yes                                    | 🗆 No   |
| Inspect and lubricate parts daily   | □ Yes                                    | 🗆 No   |
| Comments:   |  | An add a construction of the second |
|   |  |  |
|   | a an | 1  |

#### Auger Operations - What to look for:

- A system of responsibility between the operator and the tool handler when connecting and disconnecting auger sections and inserting and removing auger fork.
- During connecting and disconnecting auger sections and inserting auger for the tool, handler should position himself away from the auger column while it is rotating.
- When securing the auger to the power coupling, pin should be inserted and tapped into place using a hammer or other similar device.
- Tool hoist should be used to lower second section of auger into place.
- Both operators should be clear of auger as it is being lifted into place.
- Long-handled shovel should be used to move dirt away from auger.

#### **Overall Summary:**

## SUBSURFACE INVESTIGATIONS CHECKLIST

|       | Name of Contractor:           |            |
|-------|-------------------------------|------------|
|       | Location:                     | Project #: |
|       |                               |            |
| Date: | Time:                         | Weather:   |
|       | Person Conducting Inspection: | Title:     |

Note: As you conduct your inspection you should be able to answer each question with a **YES**. If the answer to any question is **NO**, this deficiency should be corrected as soon as possible.

|  |     | Co |    | cy<br>d? |   |
|--|-----|----|----|----------|---|
|  | YES | NO | ок | N/A      |   |
| <ol> <li>Do on-site personnel have required level PPE (steel toe boots,<br/>safety vests, hard hats, safety glasses, &amp; gloves)?</li> </ol>               |     |    |    |          |   |
| 2. Is there a copy of HASP and EAP available at each drill rig location?   |     |    |    |          |   |
| <ol><li>Are there a PID, multi-gas meter, and a colorimetric pump<br/>available at each drill rig location?</li></ol>  |     |    |    |          |   |
| 4. HAS THE FIELD SCREENING EQUIPMENT BEEN CALIBRATED IN THE MORNING?   |     |    |    |          |   |
| 5. Are calibration gases available at the site?  |     |    |    |          |   |
| 6. Are drilling fluids contained in the mud tub?   |     |    |    |          |   |
| 6a.Does mud tub set-up provide adequate splash guards to protect public?   |     |    |    |          |   |
| 6b.Does set-up present five (5) feet of walk space for public?   |     |    |    |          |   |
| 6c. Will mud tub be emptied at end of day?   |     |    |    |          |   |
| 6d. Explain how the mud tub will be covered to prevent an accident   |     |    |    |          |   |
| 6e.Are adequate containment practices being implemented to prevent<br>mud tub liquids from being released to pedestrian walkways?                            |     |    |    |          | 8 |
| 7. Is the drill rig properly grounded?   |     |    |    |          |   |
| 8. Is there a DOT permit available on-site at each drill rig location?   |     |    |    |          |   |
| 8a. Are operations in compliance with DOT permit?  |     |    |    |          |   |
| 9. Is there an orange snow fence with appropriate warning signage erected as a site barrier around the drill rig to keep-off the pedestrians from work area? |     |    |    |          |   |
| 10. Are hydrant water hoses out of the pedestrian side walk?   |     |    |    |          |   |

|  | YES | NO | OK | N/A |
|--|-----|----|----|-----|
| 11. Is there smoking and eating prohibited in the immediate work area?   |     |    |    |     |
| 12. Does each drill rig have a fire extinguisher, absorbent materials to cleanup a spill, and a first aid kit? |     |    |    |     |
| 13. Is the waste from mud tub properly contained into 55-gallon drums?   |     |    |    |     |
| 13a. Are drums properly labeled?   |     |    |    |     |
| 14. Is there proper housekeeping to avoid slips, trips, and falls?   |     |    |    |     |
| 15. Are decontamination/hand washing capabilities available at the site?                                       |     |    |    |     |
|  |     |    |    |     |

## COMMENTS:

ENVIRONMENTAL PROJECT SITE – SH&E INSPECTION FORM

| Name:   | Number: | Manager: |
|---------|---------|----------|
| Project | Project | Project  |

Date of Inspection: SH&E Inspector: Client POC:

| Site Safety Plan  | YES    | NO         | VN | 22. Are there sufficient quantities of safety equipment and repair parts?  |     |    |    |
|---|--------|------------|----|--|-----|----|----|
| 1. Is a site safety plan posted on site or accessible to all employees?       |        |            |    | Fire Prevention  | YES | NO | NA |
| <ol><li>Have potential hazards been described to employees on site?</li></ol> |        |            |    | 23. Is smoking prohibited in flammable storage areas?                      |     |    |    |
| 3. Are manufacturer safety data sheets available for review by                |        |            |    | 24. Are fire lanes established and maintained (where applicable?)          |     |    |    |
| employees on site?  | é<br>a | 2<br>2     |    | 25. Are flammable dispensing systems grounded and bonded?                  |     |    |    |
| <ol> <li>Is there a designated safety official on site?</li> </ol>            |        |            |    | 26. Are proper receptacles available for storage of flammables?            |     |    |    |
| 5. Are employees aware and knowledgeable of the results of exposure?          |        |            |    | 27. Has the local fire department been contacted to inform of work ops?    |     |    |    |
| Site Posters  |        |            |    | Welding and Cutting  |     |    |    |
| Are the following documents posted in a prominent and accessible area?        |        |            |    | 28. Are fire extinguishers present at welding and cutting operations?      |     |    |    |
| 6. Minimum Wage   |        |            |    | 29. Are confined spaces, such as, tanks, pipelines, and trenches, tested   |     | ][ |    |
| 7. OSHA Job Safety and Health Protection (or state-OSHA equivalent)           |        |            |    | prior to cutting and welding operations?                                   | ]   |    | ]  |
| 8. Equal Employment Opportunity   |        |            |    | 30. Are hot work permits available?  |     |    |    |
| Medical And First Aid   |        |            |    | 31. Are proper helmets, aprons & gloves available for welding/cutting ops? |     |    |    |
| 9. Are first aid kits accessible and identified?                              |        |            |    | 32. Are welding and machines properly grounded?                            |     |    |    |
| 10. Are emergency eye wash and safety showers available?                      |        |            |    | 33. Are oxygen and fuel gas cylinders stored a minimum of 20 feet apart?   |     |    |    |
| 11. Are daily logs for first aid present and up to date?                      |        |            |    | 34. Are only trained personnel permitted to operate welding/cutting equip? |     |    |    |
| 12. Are first aid kits inspected weekly?                                      |        |            |    | Hand And Power Tools   |     |    |    |
| Site Set Up   |        | 5          |    | 35. Are defective hand and power tools tagged and taken out of service?    |     |    |    |
| 13. Are work zones clearly defined?   |        |            |    | 36. Is eye protection available and used when operating power tools?       |     |    |    |
| 14. Are support trailers located to minimize exposure from a potential        |        |            |    | 37. Are guards and safety devices in place on power tools?                 |     |    |    |
| release?  | 8      | 6 6<br>4 1 |    | 38. Are power tools inspected before each use?                             |     |    |    |
| 15. Is general housekeeping up to Earth Tech standards?                       |        |            |    | 39. Are non-sparking tools available?                                      |     |    |    |
| Personal Protective Equipment   |        |            |    | Motor Vehicles   | l   |    |    |
| 16. Have levels of personal protection been established?                      |        |            |    | 40. Are vehicles inspected before each use?                                | С   |    |    |
| 17. Do all employees know their level of protection?                          |        |            |    | 41. Are personnel licensed for the equipment they operate?                 |     |    |    |
| 18. Are respirators used, decontaminated, inspected, and stored               |        |            |    | 42. Are unsafe vehicles tagged and reported to supervision?                |     |    |    |
| according to standard procedures?   |        |            |    | 43. Are vehicles shut down before fueling?                                 |     |    |    |
| 19. Have employees been fit-tested?   |        |            |    | 44 When backing vehicles are snotters movided (when necessary)?            |     |    |    |
| 20. Is defective personal protective equipment tagged?                        |        |            |    | 45. Is safety equipment on vehicles?                                       |     |    |    |
| 21. Does compressed breathing air meet CGA grade "D" minimum?                 |        |            |    | 46. Are loads secure on vehicles?  |     |    |    |

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ENVIRONMENTAL PROJECT SITE – SH&E INSPECTION FORM

NA

 Project Name: Project Number: Project Manager:

Date of Inspection: SH&E Inspector: Client POC:

| Emergency Plans   | YES | NO | VN  | Electrical  | YES | NO         |
|---|-----|----|-----|---|-----|------------|
| 47. Are emergency telephone numbers posted?                               |     |    |     | 74. Are warning signs exhibited on high voltage equipment (>250 V)?     |     |            |
| 48. Have emergency escape routes been designated?                         |     |    |     | 75. Is electrical equipment and wiring properly guarded?                |     |            |
| 49. Are employees familiar with site-specific emergency signals?          |     |    |     | 76. Are electrical lines, extension cords, and cables guarded and       |     |            |
| Materials Handling  |     |    |     | maintained in good condition?   |     |            |
| 50. Are materials stacked and stored as to prevent sliding or collapsing? |     |    |     | 77. Are extension cords kept out of wet areas?                          |     |            |
| 51. Are flammables and combustibles stored in non-smoking areas?          |     |    |     | 78. Is damaged electrical equipment tagged and taken out of service?    |     |            |
| 52. Is machinery braced when personnel are performing maintenance?        |     |    |     | 79. Have underground electrical lines been identified by proper         |     |            |
| 53. Are tripping hazards labeled?   |     |    |     | authorities?  | [   | [          |
| 54. Are semi-trailers chocked?  |     |    |     | 80. Has a positive lock-out system been established by the project      |     | 10<br>2010 |
| 55. Are fixed jacks used under semi-trailers?                             |     |    |     | Slines And Chains   | -   |            |
| 56. Are riders prohibited on materials handling equipment?                |     |    |     | 81 Are damaged slines chains and rigoing tagged and taken out of        | Ē   |            |
| 57. Are cranes inspected as prescribed and logged?                        |     |    |     | Service?  |     | ]          |
| 58. Are OSHA-approved manlifts provided for the lifting of personnel?     |     |    |     | 82. Are slings inspected before each use?                               |     |            |
| 59. Are all containers labeled as to contents?                            |     |    |     | 83. Are slings padded or protected from sharp corners?                  |     |            |
| 60. Are flammable liquids stored in approved safety cans?                 |     |    |     | 84. Do employees keep clear of suspended loads?                         |     |            |
| Hazardous Waste/Environmental Compliance                                  |     |    | < . | Compressed Gas Cylinders  |     |            |
| 61. Are hazardous wastes stored in DOT approved containers?               |     |    |     | 85. Are breathing air cylinders charged only to prescribed pressures?   |     |            |
| 62. Is hazardous waste stored in a secure area?                           |     |    |     | 86. Are like cylinders segregated in well ventilated areas?             |     |            |
| 63. Are hazardous waste containers labeled and dated?                     |     |    |     | 87. Is smoking prohibited in cylinder storage areas?                    |     |            |
| 64. Are waste container dates outdated?                                   |     |    |     | 88. Are cylinders stored secure and upright?                            |     |            |
| 65. Is a contingency plan on file?  |     |    |     | 89. Are cylinders protected from snow, rain, etc.?                      |     |            |
| 66. Is there a preparedness and prevention plan in effect?                |     |    |     | 90. Are cylinder caps in place before cylinders are moved?              |     |            |
| 67. Are warning signs posted where required?                              |     |    |     | 91. Are fuel gas and $0_2$ cylinders stored a minimum of 20 feet apart? |     |            |
| 68. Have the project's environmental hazards been assessed?               |     |    |     | Ladders and Scaffolding   |     |            |
| 69. Has a reg. permit needs assessment been completed for the project?    |     |    |     | 92. Are ladders/scaffolds placed on a flat, firm surface?               |     |            |
| Fire Protection   |     |    |     | 93. Are ladders/scaffolds planks free of mud, ice, grease, etc.?        |     |            |
| 70. Has a fire warning system been established?                           |     |    |     | 94. Are ladders/scaffolding inspected before each use?                  |     |            |
| 71. Do employees know the location and use of all fire extinguishers?     |     |    |     | 95. Are defective ladders or scaffold parts taken out of service?       |     |            |
| 72. Are fire extinguishers marked and inspected weekly?                   |     |    |     | 96. Does scaffold height exceed 4 times the width or base dimension?    |     |            |
| 73. Are combustible materials segregated from open flames?                |     |    |     | 97. Does scaffold planking overlap a minimum of 12 inches?              |     |            |

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ENVIRONMENTAL PROJECT SITE – SH&E INSPECTION FORM

| Project Name:    | Р       |
|------------------|---------|
| Project Number:  | 5       |
| Project Manager: | $\circ$ |

98. Does scaffold planking extend over end supports between 6" to 18"?

| [Inspection: | Inspector: | POC:     |
|--------------|------------|----------|
| Date of      | SH&E       | Client F |

|    |          | Personnel Decontamination  | YES    | 0N | VN     |   |
|----|----------|--|--------|----|--------|---|
| NO | NA       | 121. Are decontamination stations set up in the site contamination reduction |        |    |        |   |
|    |          | zone(s)?   | h<br>P |    | н<br>1 |   |
| ]  | ]        | 122. Are waste receptacles available for contaminated clothing / PPE?        |        |    |        |   |
|    |          | 123. Are steps taken to contain liquids used for decontamination?            |        |    |        |   |
|    |          | 124. Have decontamination steps and procedures been covered by the site      |        |    |        |   |
| E  |          | supervisor or acting site safety officer?                                    |        |    |        |   |
|    |          | 125. Are personnel using utility knives or equivalent equipment to doff      |        |    |        |   |
|    |          | PPE?   | I      |    |        |   |
|    |          | 126. Is all personal protective equipment and respiratory equipment being    |        | L  | E      | - |
|    |          | cleaned on a daily basis (when applicable)?                                  |        | ľ  | ļ      |   |
|    |          |  |        |    | ia.    |   |
| Ľ  | 27<br>27 |  |        |    |        |   |
|    |          | nenotion Summary.  |        |    |        |   |

| Walking and Working Surfaces   | YES | 0N<br>N | NA | 121. Are decontamination stations set up in the site contamination reduction   |                    |        |
|--|-----|---------|----|--|--------------------|--------|
| 99. Are access ways, stairways, ramps, and ladders clean of ice, mud   |     |         |    | zone(s)?   | 2)<br>6            | k<br>A |
| snow or debris?  | ]   | ]       | ]  | 122. Are waste receptacles available for contaminated clothing / PPE?  |                    |        |
| 100. Do ladders exceed maximum lengths?  |     |         |    | 123. Are steps taken to contain liquids used for decontamination?  |                    |        |
| 101. Are ladders used in passageways, doors, or driveways?   |     |         |    | 124. Have decontamination steps and procedures been covered by the site  |                    |        |
| 102. Are broken or damaged ladders tagged and taken out of service?  |     |         |    | supervisor or acting site safety officer?  |                    |        |
| 103. Are metal ladders prohibited in electrical service?   |     |         |    | 125. Are personnel using utility knives or equivalent equipment to doff  |                    |        |
| 104. Are stairways and floor openings guarded?   |     |         |    |  |                    |        |
| 105. Are safety feet installed on straight and extension ladders?  |     |         |    | 1.20. Is all personal protective equipment and respiratory equipment being<br>cleaned on a daily basis (when annlicable)?                      | - 01               |        |
| 106. Is general housekeeping up to Earth Tech standards?   |     |         |    | i (Aronatida usura) error anna an aranan   | _                  | -      |
| 107. Are support trailers accessible for approach by emergency vehicles?   |     |         |    | Increation Summary.  |                    |        |
| 108. Is the site properly secured during and after work hours?   |     |         |    |  |                    |        |
| Heavy Equipment  |     |         |    |  |                    |        |
| 109. Is heavy equipment inspected as recommended by the manufacturer?  |     |         |    |  |                    |        |
| 110. Is defective heavy equipment tagged and taken out of service?   |     |         |    |  |                    |        |
| 111. Are project roads and structures inspected for load capacities and proper clearances?                                     |     |         |    |  |                    |        |
| 112. Is heavy equipment shut down for fueling and maintenance?   |     |         |    |  |                    |        |
| Excavation   |     |         |    |  |                    |        |
| 113. Are the sides of excavations sloped or shored to prevent caving in on employees?  |     |         |    |  |                    |        |
| 114. Are guardrails or fences placed around excavations, near pedestrian or vehicle thoroughfares?                             |     |         |    | I have reviewed this hispection checklist with the safety hispector, fur-<br>the recommendations and will make every attempt to immediately im | ny unat<br>nplemer | it the |
| 115. Prior to opening excavations, are utilities located and marked?   |     |         |    | appropriate corrective actions.  |                    |        |
| 116. Are ladders used in trenches over 4 feet deep (when entered)?   |     |         |    |  |                    |        |
| 117. Is material excavated placed a minimum of 3 ft from the trench?   |     |         |    | Droieot Reconnee Monorer   |                    | ,      |
| Confined Spaces  |     |         |    | TACATACADATIA ANTINA                                | LJal               | ט      |
| 118. Have employees scheduled to be part of the confined space entry team been trained to the level of their responsibilities? |     |         |    |  |                    |        |
| 119. Are confined space permits available on project site?   |     |         |    | SH $\&$ E Inspector (or designated alternate)  | Dat                | e      |
| 120. Is a confined space entry procedure on the project site?  |     |         |    |  |                    |        |

Site Inspection Form (rev07/08/07)

AECOM



SPI Supplies Division Structure Probe, Inc. P.O. Box 656 West Chester, PA 19381-0656 USA Phone: 1-(610)-436-5400 Fax: 1-(610)-436-5755 E-mail: spi3spi@2spi.com WWW: http://www.2spi.com Manufacturer's CAGE: 1P573

## Material Safety Data Sheet

SPI #01200-AB and #01200A-AB Alconox<sup>®</sup> Powdered Detergent

#### **Section 1: Identification**

Date Effective...... November 14, 2005 (most recent revision) Chemical Name/Synonyms... On Label: Alconox® Chemical Family..... Anionic powdered detergent Emergencies Contacting CHEMTREC: 24 Hour Emergency Use Only #'s... Worldwide phone: 1-(703)-527-3887 Worldwide FAX: 1-(703)-741-6090 Toll-free phone: 1-(800)-424-9300 USA only Product or Trade Name.... SPI #01200-AB and #01200A-AB Alconox® Powdered Detergent CAS #..... Not applicable Chemical Formula..... Not applicable


#### Section 2 Composition

Component Name CAS # OSHA OSHA ACGIH ACGIH

No hazardous ingredients in Alconox Powdered Detergent as defined by the OSHA Standard and Hazardous Substance List 29 CFR 1910 Subpart Z.

|   | Health              | 0 |   |  |
|---|---------------------|---|---|--|
| Hazardous Material<br>Information System<br>USA | Fire Hazard         | 0 | National Fire<br>Protection Association |  |
|   | Reactivity          | 0 | USA                                     |  |
|   | Personal Protection |   |   |  |

NFPA (National Fire Protection Association) Rating (Scale 0-4): HEALTH=0 FLAMMABILITY=0 REACTIVITY=0 OTHER=0 Not known

#### Section 3: Hazard Identification

Routes of entry Inhalation? Yes Skin? No Ingestion? Yes Health Hazards (Acute and chronic): Inhalation of powder may prove locally irritating to mucous membranes. Ingestion may cause discomfort and/or diarrhea. Eye contact may prove irritating. Carcinogenicity: NTP? No IARC Monographs? No OSHA Regulated? No

#### **Section 4: First Aid Measures**

Signs and Symptoms of Exposure: Exposure may irritate mucous membranes. May cause sneezing. Medical conditions generally aggravated by exposure: Not established. Unnecessary exposure to this product or any industrial chemical should be avoided. Respiratory conditions may be aggravated by powder if air borne. Emergency and First Aid Procedures: Eyes: Immediately flush eyes with copious amounts of water for minimum 15 minutes. Call physician.

Page 1 of 1

Skin: Flush with plenty of water.

Ingestion: Drink large quantities of water or milk. Do not induce vomiting. If vomiting occurs re-administer fluids. See a physician for discomfort.

#### **Section 5: Fire Fighting Measures**

NFPA Rating: Not known

#### Extinguishing Media

Suitable/Not suitable:

SMALL FIRE: Use DRY chemical powder, water, foam, carbon dioxide

LARGE FIRE: Use extinguishing media suitable for the surrounding materials.

Special firefighting procedures: Self-contained positive pressure breathing apparatus and protective clothing should be worn when fighting fires involving chemicals.

Unusual Fire/Explosion Hazards: None

Hazardous thermal decomposition products: None known.

Protection of fire fighters: No special measures are required.

Flammable Limits: LEL: No data UEL: No data

#### **Section 6: Accidental Release Measures**

Personal precautions: No special precautions Environmental Precautions and Clean Up Methods: Material foams profusely. Recover as much as possible and flush remainder to sewer. Material is biodegradable.

#### Section 7: Handling and Storage

Material should be stored in a dry area to prevent caking.

**Section 8: Exposure Controls and Personal Protection** 

Engineering controls: Normal ventilation is normally required when handling or using this product. Avoid conditions that could produce dusting.

#### Personal Protective Equipment

Respiratory system: Dust mask recommended but not required.

Skin and body: Laboratory coat recommended but not required.

- Hands: Impervious gloves recommended
- Eyes: Goggles are recommended, especially when handling solutions irrespective of what they might be.
- Other: Wash hands before eating, drinking, or smoking.

#### **Section 9: Physical and Chemical Properties**

Physical State and Appearance: White powder interspersed with cream colored flakes. Odor: None Boiling Point: Not applicable Melting Point: Not applicable Density (water = 1): Not applicable Solubility: Appreciable, to 10% at ambient conditions. Octanol/water partition coefficient: Not available pH: Not known Flash Point: None Flammability: Non-flammable Autoignition temperature: Not applicable

#### Section 10: Stability and Reactivity

Chemical Stability: The product is stable Hazardous polymerization: Will not occur

Conditions to Avoid: None Hazardous Products of Deposition: May release CO<sub>2</sub> on burning. Reactions with Air and Water: Does not react with air, water or other common materials.

#### Section 11: Toxicological Information

Summary: Not considered to be toxic to humans or animals. Skin Effects: Can be locally irritating Eye Irritation: Can be irritating to the eyes Inhalation: Dust can be irritating to mucous membranes Sensitization: Not known Chronic toxicity: There is no known effect from the chronic exposure to this product.

#### **Section 12: Ecological Information**

**Exotoxicity:** Not know but it is expected to be low because the material is biodegradable.

Environmental Fate: It is biodegradable.

**Bioaccumulation:** Not expected to occur (because the material is biodegradable).

#### **Section 13: Disposal Considerations**

This material is NOT classified as a hazardous material by RCRA. Use only licensed transporters and permitted disposal facilities and conform to all laws.

Recycle to process, if possible.

Germany water class: VCI WGK: No products were found.

Methods of disposal; waste of residues; contaminated packaging:

Waste must be disposed of in accordance with federal, state and local environmental control regulations.

#### **Section 14: Transport Information**

Proper Shipping Name: Non-Regulated, No dangerous cargo
DOT Hazard Class: Non-Regulated, No dangerous cargo

| UN/NA ID:                               | Non-Regulated, No dangerous cargo |
|---|-----------------------------------|
| Packing Group:                          | Not Applicable                    |
| Labels:                                 | Not Regulated                     |
| Marine Pollutant:                       | No                                |
| NAER Guidebook:                         | Not Regulated                     |
| DOT Status:                             | Not Regulated                     |
| Land-Road/Railway:<br>ADR/RID Class: No | o dangerous cargo                 |
| Sea:<br>IMDG Class: No da               | angerous cargo                    |
| Air:<br>IATA-DGR Class: N               | No dangerous cargo                |

#### **Section 15: Regulatory Information**

TSCA: All components of this product are listed on the TSCA 8(b) inventory. If identified components of this product are listed under the TSCA 12(b) Export Notification Rule, they will be listed below.

TSCA 12(b) Component Listed under TSCA Section

SARA Title 3: Section 313 Information/Emissions Reporting (40 CFR 372):

Component Reporting Threshold

SARA-Section 311/312:

No components present in this product are subject to the reporting requirements of this statute.

CERCLA Hazardous Substances and their Reportable Quantities:

Component Reportable Quantity

EU Regulations: Risk Phrases: This product is not classified according to the EU regulations.

Safety Phrases: Not applicable

Contains: Not applicable

#### California Prop. 65:

Proposition 65 requires manufacturers or distributors of consumer products into the State of California to provide a warning statement if the product contains ingredients for which the State has found to cause cancer, birth defects or other reproductive harm. If this product contains an ingredient listed by the State of California to cause cancer or reproductive toxicity, it will be listed below:

None found

#### **Section 16: Other Information**

#### Disclaimer of Liability:

Caution! Do not use SPI Supplies products or materials in applications involving implantation within the body; direct or indirect contact with the blood pathway; contact with bone, tissue, tissue fluid, or blood; or prolonged contact with mucous membranes. Products offered by SPI Supplies are not designed or manufactured for use in implantation in the human body or in contact with internal body fluids or tissues. SPI Supplies will not provide to customers making devices for such applications any notice, certification, or information necessary for such medical device use required by US FDA (Food and Drug Administration) regulation or any other statute. SPI Supplies and Structure Probe, Inc. make no representation, promise, express warranty or implied warranty concerning the suitability of these materials for use in implantation in the human body or in contact with internal body tissues of fluids.

The information and recommendations set forth above are taken from sources believed to be accurate as of the date hereof, however SPI Supplies and Structure Probe, Inc. make no warranty with respect to the accuracy of the information or the suitability of the recommendations, and assume no liability to any user thereof. The information contained in this sheet does not constitute a hazard assessment and should not be used in place of the user's own assessment of work place risks as required by other health and safety legislation. Be aware of the Structure Probe, Inc. <u>Copyright Policy</u>. Structure Probe, Inc. grants a nonexclusive license to make unlimited copies of this safety sheet for internal use only. Quite obviously, this information would pertain only to this material when purchased from SPI Supplies as product from other sources, with other ingredients and impurity levels could have substantially different properties.

Thursday February 22, 2007

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Worldwide Distributors, Representatives, and Agents



# MATERIAL SAFETY DATA SHEET

Prepared to U.S. OSHA, CMA, ANSI and Canadian WHMIS Standards

| <b>PARI I</b> What is the material and what do I need to know in an emergency? |   |  |  |  |
|--|---|--|--|--|
| 1. PRODUCT IDENTIFICATION  |   |  |  |  |
| CHEMICAL NAME; CLASS: NON-FLAMMABLE GAS MIXTURE                                |   |  |  |  |
| •<br>PRODUCT USE:<br>SUPPLIER/MANUFACTURER'S NAME:                             | Document Number: 002103<br>For general analytical/synthetic chemical uses.<br>AIRGAS INC. |  |  |  |
| ADDRESS:   | 259 North Radnor-Chester Road   |  |  |  |
|  | Suite 100   |  |  |  |
|  | Radnor, PA 19087-5283   |  |  |  |
| BUSINESS PHONE:  | 1-610-687-5253  |  |  |  |
| EMERGENCY PHONE:   | 1-800-949-7937  |  |  |  |
| International:   | 1-423-479-0293  |  |  |  |
| DATE OF PREPARATION:   | April 22, 2001  |  |  |  |

# 2. COMPOSITION and INFORMATION ON INGREDIENTS

| CHEMICAL<br>NAME  | CAS #          | mole %          | EXPOSURE LIMITS IN AIR  |      |      |      |       |       |
|---|----------------|-----------------|---|------|------|------|-------|-------|
|   |                |                 | ACGIH   |      | OSHA |      | NIOSH | OTHER |
|   |                |                 | TLV   | STEL | PEL  | STEL | IDLH  |       |
|   |                |                 | ppm   | ppm  | ppm  | ppm  | ppm   | ppm   |
| Isobutylene   | 115-11-7       | 1 ppm -<br>1.7% | There are no specific exposure limits for Isobutylene. Isobutylene is a simple asphyxiant (SA). Oxygen levels should be maintained above 19.5%. |      |      |      |       |       |
| Air   | 25635-88-<br>5 | Balance         | There are no specific exposure limits applicable to Air.  |      |      |      |       |       |
| Air is a mixture of gases. The primary components of air, and the approximate concentration of each component, are listed below |                |                 |   |      |      |      |       |       |

| Nitrogen | 7727-37-9 | 79% | There are no specific exposure limits for Nitrogen. Nitrogen is a simple asphyxiant (SA). Oxygen levels should be maintained above 19.5%. |
|----------|-----------|-----|---|
| Oxygen   | 7782-44-7 | 21% | There are no specific exposure limits for Oxygen  |

NE = Not Established. See Section 16 for Definitions of Terms Used.

NOTE (1): ALL WHMIS required information is included in appropriate sections based on the ANSI Z400.1-1998 format. This product has been classified in accordance with the hazard criteria of the CPR and the MSDS contains all the information required by the CPR.

# **3. HAZARD IDENTIFICATION**

**EMERGENCY OVERVIEW:** This product is a colorless, odorless, non-flammable gas. The main health hazards associated with releases of this gas are related to the high pressure within the cylinder. Air, the main component of this product, is generally considered non-flammable, however, Air will support combustion. The flammable component of this gas mixture is below the LEL. A cylinder rupture hazard exists when this product, which is under pressure, is subjected to heat or flames. Emergency responders must wear personal protective equipment appropriate for the situation to which they are responding.

<u>SYMPTOMS OF OVER-EXPOSURE BY ROUTE OF EXPOSURE</u>: The most significant route of overexposure for air is by inhalation at elevated or reduced pressure.

INHALATION: This product is non-toxic. Air, the main component of this product, is necessary for life.

<u>OTHER POTENTIAL HEALTH EFFECTS</u>: Contact with rapidly expanding gases (which are released under high pressure) may cause frostbite. Symptoms of frostbite include change in skin color to white or grayish-yellow. The pain after contact with liquid can quickly subside.

<u>HEALTH EFFECTS OR RISKS FROM EXPOSURE: An Explanation in Lay Terms</u>. Over-exposure to this product may cause the following health effects:

**ACUTE:** The most significant hazards associated with compressed air is the pressure hazard. Contact with rapidly expanding gases (which are released under high pressure) may cause frostbite. Symptoms of frostbite include change in skin color to white or grayish-yellow. The pain after contact with liquid can quickly subside.

**CHRONIC:** There are currently no known adverse health effects associated with chronic exposure to this gas.

**TARGET ORGANS:** ACUTE: Respiratory system under ambient low pressure conditions. Central nervous system under ambient high pressure conditions. CHRONIC: None expected.

# **PARI II** What should I do if a hazardous situation occurs?

### 4. FIRST-AID MEASURES

RESCUERS SHOULD NOT ATTEMPT TO RETRIEVE VICTIMS OF EXPOSURE TO THIS PRODUCT WITHOUT ADEQUATE PERSONAL PROTECTIVE EQUIPMENT. At a minimum, Self-Contained Breathing Apparatus equipment should be worn.

Victim(s) must be taken for medical attention. Rescuers should be taken for medical attention, if necessary. Take copy of label and MSDS to physician or other health professional with victim(s). Remove victim(s) to fresh air, as quickly as possible. In case of eye contact which leads to irritation,

immediately flush eyes with copious amounts of water for at least 15 minutes. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Only trained personnel should administer supplemental oxygen.

In case of frostbite, place the frostbitten part in warm water. DO NOT USE HOT WATER. If warm water is not available, or is impractical to use, wrap the affected parts gently in blankets. Alternatively, if the fingers or hands are frostbitten, place the affected area in the armpit. Encourage victim to gently exercise the affected part while being warmed. Seek immediate medical attention.

<u>MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE</u>: Acute or chronic respiratory conditions, as well as disorders involving the "Target Organs", as listed in Section 3 (Hazard Information), may be aggravated by overexposure to the components of this product.

RECOMMENDATIONS TO PHYSICIANS: Administer oxygen as soon as possible, following exposure.

# 5. FIRE-FIGHTING MEASURES

FLASH POINT: Not applicable.

AUTOIGNITION TEMPERATURE: Not applicable.

FLAMMABLE LIMITS (in air by volume, %):

Lower (LEL): Not applicable.

Upper (UEL): Not applicable.

FIRE EXTINGUISHING MATERIALS: Non-flammable gas. Use extinguishing media appropriate for surrounding fire.

<u>UNUSUAL FIRE AND EXPLOSION HAZARDS</u>: When involved in a fire, this material may decompose and produce toxic gases including carbon monoxide and carbon dioxide. Additionally, when involved in fire, the cylinders may rupture.

Explosion Sensitivity to Mechanical Impact: Not Sensitive.

Explosion Sensitivity to Static Discharge: Not Sensitive.

<u>SPECIAL FIRE-FIGHTING PROCEDURES</u>: Structural firefighters must wear Self-Contained Breathing Apparatus and full protective equipment. Move fire-exposed cylinders from area, if it can be done without risk to fire-fighters. Withdraw immediately in case of rising sounds from venting pressure relief devices or any discoloration of tanks or cylinders due to a fire.

# 6. ACCIDENTAL RELEASE MEASURES

SPILL AND LEAK RESPONSE: Uncontrolled releases should be responded to by trained personnel using pre-planned procedures. Proper protective equipment should be used. In case of a release, clear the affected area, protect people, and respond with trained personnel. Minimum Personal Protective Equipment should be Level D: safety glasses, and mechanically-resistant gloves. Level B, which includes the use of Self- Contained Breathing Apparatus, should be worn when oxygen levels are below 19.5% or are unknown. Locate and seal the source of the leaking gas. If this does not stop the

release (or if it is not possible to reach the valve), allow the gas to release in place or remove it to a safe area and allow the gas to be released there.

**PARI III** How can I prevent hazardous situations from occurring?

# 7. HANDLING and STORAGE

WORK PRACTICES AND HYGIENE PRACTICES: Do not eat or drink while handling chemicals.

<u>STORAGE AND HANDLING PRACTICES</u>: Cylinders should be stored in dry, well-ventilated areas away from sources of heat. Compressed gases can present significant safety hazards. Store containers away from heavily trafficked areas and emergency exits.

<u>SPECIAL PRECAUTIONS FOR HANDLING GAS CYLINDERS</u>: Protect cylinders against physical damage. Store in cool, dry, well-ventilated, fireproof area, away from flammable or combustible materials and corrosive atmospheres. Store away from heat and ignition sources and out of direct sunlight. Do not store near elevators, corridors or loading docks. Do not allow area where cylinders are stored to exceed 52°C (125°F). Isolate from incompatible materials including flammable materials (see Section 10, Stability and Reactivity), which can burn violently. Use only storage containers and equipment (pipes, valves, fittings to relieve pressure, etc.) designed for the storage of Air. Do not store containers where they can come into contact with moisture. Cylinders should be stored upright and be firmly secured to prevent falling or being knocked over. Cylinders can be stored in the open, but in such cases, should be protected against extremes of weather and from the dampness of the ground to prevent rusting. Never tamper with pressure relief devices in valves and cylinders. The following rules are applicable to situations in which cylinders are being used:

Before Use: Move cylinders with a suitable hand-truck. Do not drag, slide or roll cylinders. Do not drop

cylinders or permit them to strike each other. Secure cylinders firmly. Leave the valve protection cap inplace until cylinder is ready for use.

**During Use:** Use designated CGA fittings and other support equipment. Do not use adapters. Do not heat cylinder by any means to increase the discharge rate of the product from the cylinder. Use check valve or trap in discharge line to prevent hazardous backflow into the cylinder. Do not use oils or grease on gas-handling fittings or equipment.

After Use: Close main cylinder valve. Replace valve protection cap. Mark empty cylinders "EMPTY".

**NOTE:** Use only DOT or ASME code containers. Earth-ground and bond all lines and equipment associated with this product. Close valve after each use and when empty. Cylinders must not be recharged except by or with the consent of owner. For additional information refer to the Compressed Gas Association Pamphlet P-1, *Safe Handling of Compressed Gases in Containers*. Additionally, refer to CGA Bulletin SB-2 "*Oxygen Deficient Atmospheres*".

<u>PROTECTIVE PRACTICES DURING MAINTENANCE OF CONTAMINATED EQUIPMENT</u>: Follow practices indicated in Section 6 (Accidental Release Measures). Make certain application equipment is locked and tagged out safely. Purge gas handling equipment with inert gas (i.e. nitrogen) before attempting repairs. Always use product in areas where adequate ventilation is provided.

# 8. EXPOSURE CONTROLS - PERSONAL PROTECTION

VENTILATION AND ENGINEERING CONTROLS: Use with adequate ventilation.

<u>RESPIRATORY PROTECTION</u>: Maintain Oxygen levels above 19.5% in the workplace. If respiratory protection is needed, use only protection authorized in the U.S. Federal OSHA Standard (29 CFR 1910.134), applicable U.S. State regulations, or the Canadian CSA Standard Z94.4-93 and applicable standards of Canadian Provinces. Oxygen levels below 19.5% are considered IDLH by OSHA. In such atmospheres, use of a full facepiece pressure/demand SCBA or a full facepiece, supplied air respirator with auxiliary self-contained air supply is required under OSHA's Respiratory Protection Standard (1910.134-1998).

<u>EYE PROTECTION</u>: Splash goggles, face-shields or safety glasses. If necessary, refer to U.S. OSHA 29 CFR 1910.133, or Canadian Standards.

HAND PROTECTION: Wear mechanically-resistant gloves when handling cylinders of this product. If necessary, refer to U.S. OSHA 29 CFR 1910.138 or appropriate Standards of Canada.

<u>BODY PROTECTION</u>: Use body protection appropriate for task. If a hazard of injury to the feet exists due to falling objects, rolling objects, where objects may pierce the soles of the feet or where employee's feet may be exposed to electrical hazards, use foot protection, as described in U.S. OSHA 29 CFR.

# 9. PHYSICAL and CHEMICAL PROPERTIES

The following information is for **Air**, the main component of this product , unless otherwise stated:

| RELATIVE VAPOR DENSITY: 1                         | EVAPORATION RATE (nBuAc = 1): Not applicable.               |    |
|---|---|----|
| SPECIFIC GRAVITY: Not applicable.                 | FREEZING POINT: -216.2°C (-357.2°F)                         |    |
| SOLUBILITY IN WATER: 1.49% (v/v)                  | BOILING POINT @ 1 atmos: -194.3°C(-317.8°F                  | F) |
| VAPOR PRESSURE, mmHg @ 20°C:.                     | <u>pH</u> : Not applicable.                                 |    |
| EXPANSION RATIO: Not applicable.                  | VAPOR PRESSURE: Not applicable.                             |    |
| SPECIFIC VOLUME: 13.3 ft <sub>3</sub> /lb; (0.833 | m <sub>3</sub> /kg) <u>ODOR THRESHOLD</u> : Not applicable. |    |
| COEFFICIENT WATER/OIL DISTRIBU                    | TION: Not applicable.                                       |    |

The following information is pertinent to this gas mixture:

<u>APPEARANCE, ODOR AND COLOR</u>: This product is a colorless, odorless gas.

<u>HOW TO DETECT THIS SUBSTANCE</u> (warning properties): There are no distinctive properties to this product. In terms of leak detection, fittings and joints can be painted with a soap solution to detect leaks, which will be indicated by a bubble formation.

### **10. STABILITY and REACTIVITY**

STABILITY: Normally stable.

DECOMPOSITION PRODUCTS: None known.

MATERIALS WITH WHICH SUBSTANCE IS INCOMPATIBLE. Air (the main component of this product) is not compatible with fuels, in that air will support combustion. The Isobutylene component of this mixture is

incompatible with Strong oxidizers (e.g., chlorine, bromine pentafluoride, oxygen, oxygen difluoride, and nitrogen trifluoride).

HAZARDOUS POLYMERIZATION: Will not occur.

<u>CONDITIONS TO AVOID</u>: Contact with incompatible materials and exposure to heat, sparks and other sources of ignition. Cylinders exposed to high temperatures or direct flame can rupture or burst.

**PARI III** How can I prevent hazardous situations from occurring?

# 11. TOXICOLOGICAL INFORMATION

TOXICITY DATA: The following toxicology data are for the components of this gas mixture present at a level greater than 1 mole %:

### ISOBUTYLENE:

LC50 (Inhalation-Rat) 620 gm/m3/4 hours LC50 (Inhalation-Mouse) 415 gm/m3/2 hours

<u>SUSPECTED CANCER AGENT</u>: No component of this gas mixture is found on the following lists: FEDERAL OSHA Z LIST, NTP, CAL/OSHA, IARC, and therefore is not considered to be, nor suspected to be, cancer causing agents by these agencies.

<u>IRRITANCY OF PRODUCT</u>: Contact with rapidly expanding gases can cause frostbite and damage to exposed skin and eyes.

SENSITIZATION OF PRODUCT: No component of this product is a skin or respiratory sensitizer.

<u>REPRODUCTIVE TOXICITY INFORMATION</u>: Listed below is information concerning the effects of this product and its components on the human reproductive system.

Mutagenicity: This product is not reported to cause mutagenic effects in humans.

Embryotoxicity: This product is not reported to cause embryotoxic effects in humans.

Teratogenicity: This product is not reported to cause teratogenic effects in humans.

<u>Reproductive Toxicity</u>: This product is not reported to cause adverse reproductive effects in humans.

A mutagen is a chemical which causes permanent changes to genetic material (DNA) such that the changes will propagate through generation lines. An embryotoxin is a chemical which causes damage to a developing embryo (i.e. within the first eight weeks of pregnancy in humans), but the damage does not propagate across generational lines. A teratogen is a chemical which causes damage to a developing fetus, but the damage does not propagate across generational lines. A reproductive toxin is any substance which interferes in any way with

the reproductive process.

<u>BIOLOGICAL EXPOSURE INDICES</u>: Biological Exposure Indices (BEIs) have been determined for the components of this product are as follows:

# 12. ECOLOGICAL INFORMATION

ENVIRONMENTAL STABILITY: This gas will be dissipated rapidly in well-ventilated areas.

<u>EFFECT OF MATERIAL ON PLANTS or ANIMALS</u>: No adverse effect is anticipated to occur to plant-life, except for frost produced in the presence of rapidly expanding gases.

<u>EFFECT OF CHEMICAL ON AQUATIC LIFE</u>: No evidence of an adverse effect of this product on aquatic life is currently available.

# 13. DISPOSAL CONSIDERATIONS

<u>PREPARING WASTES FOR DISPOSAL</u>: Product removed from cylinder must be disposed of in accordance with appropriate U.S. Federal, State and local regulations or with regulations of Canada and its Provinces. Return cylinders with residual product to Airgas, Inc. Do not dispose of locally.

### **14. TRANSPORTATION INFORMATION**

THIS GAS MIXTURE IS HAZARDOUS AS DEFINED BY 49 CFR 172.101 BY THE U.S. DEPARTMENT OF TRANSPORTATION.

| PROPER SHIPPING NAME:           | Compressed gases, n.o.s. (Air, Isobutylene) |
|---------------------------------|---|
| HAZARD CLASS NUMBER and DESCRIP | FION: 2.2 (Compressed Gas)                  |
| UN IDENTIFICATION NUMBER:       | UN 1956                                     |
| PACKING GROUP:                  | Not Applicable                              |
| DOT LABEL(S) REQUIRED:          | Compressed Gas                              |

NORTH AMERICAN EMERGENCY RESPONSE GUIDEBOOK NUMBER (2000): 126

TRANSPORT CANADA, TRANSPORTATION OF DANGEROUS GOODS REGULATIONS: This gas mixture is considered as dangerous goods, per regulations of Transport Canada. Use the above information for the preparation of Canadian Shipments.

# 15. REGULATORY INFORMATION

### ADDITIONAL U.S. REGULATIONS:

<u>U.S. SARA REPORTING REQUIREMENTS</u>: The components of this gas mixture are not subject to the reporting requirements of Sections 302, 304 and 313 of Title III of the Superfund Amendments and Reauthorization Act.

<u>U.S. SARA THRESHOLD PLANNING QUANTITY</u>: There are no specific Threshold Planning Quantities for this material. The default Federal MSDS submission and inventory requirement filing threshold of 10,000 lb (4,540 kg) may apply, per 40 CFR 370.20.

U.S. CERCLA REPORTABLE QUANTITY (RQ): Not applicable.

U.S. TSCA INVENTORY STATUS: The components of this product are listed on the TSCA Inventory.

OTHER U.S. FEDERAL REGULATIONS: Not applicable.

<u>U.S. STATE REGULATORY INFORMATION</u>: The components of this gas mixture are covered under specific State regulations, as denoted below:

Alaska - Designated Toxic and Hazardous Substances: None.

California - Permissible Exposure Limits for Chemical Contaminants: None.

Florida - Substance List: Isobutylene. Illinois - Toxic Substance List: None.

Kansas - Section 302/313 List: None.

Minnesota - List of Hazardous Substances: Isobutylene.

Massachusetts - Substance List: None.

Missouri - Employer Information/Toxic Substance List: None.

New Jersey - Right to Know Hazardous Substance List: Isobutylene.

North Dakota - List of Hazardous Chemicals, Reportable Quantities: None.

Pennsylvania - Hazardous Substance List: Isobutylene.

Rhode Island - Hazardous Substance List: None.

Texas - Hazardous Substance List: None.

West Virginia - Hazardous Substance List: None.

Wisconsin - Toxic and Hazardous Substances: None.

CALIFORNIA SAFE DRINKING WATER AND TOXIC ENFORCEMENT ACT (PROPOSITION 65): No component of this product is on the California Proposition 65 Lists.

### LABELING: CAUTION: HIGH PRESSURE GAS.

MAY ACCELERATE COMBUSTION.

Keep oil and grease away.

Use equipment rated for cylinder pressure.

Close valve after each use and when empty.

Use in accordance with the Material Safety Data Sheet.

FIRST-AID: IF INHALED, remove to fresh air. If not breathing, give artificial respiration. If

breathing is difficult, give oxygen. Call a physician.

IN CASE OF FROSTBITE, obtain immediate medial attention.

DO NOT REMOVE THIS PRODUCT LABEL.

### ADDITIONAL CANADIAN REGULATIONS:

CANADIAN DSL INVENTORY: The components of this product are listed on the DSL Inventory.

OTHER CANADIAN REGULATIONS: Not applicable.

CANADIAN ENVIRONMENTAL PROTECTION ACT (CEPA) PRIORITIES SUBSTANCES LISTS: The components of this product are not on the CEPA Priorities Substances Lists.

CANADIAN WHMIS SYMBOLS: Class A: Compressed Gases

### **16. OTHER INFORMATION**

**PREPARED BY:** CHEMICAL SAFETY ASSOCIATES, Inc.

9163 Chesapeake Drive, San Diego, CA 92123-1002

858/565-0302

The information contained herein is based on data considered accurate. However, no warranty is expressed or implied regarding the accuracy of these data or the results to be obtained from the use thereof. AirGas, Inc. assumes no responsibility for injury to the vendee or third persons proximately caused by the material if reasonable safety procedures are not adhered to as stipulated in the data sheet. Additionally, AirGas, Inc. assumes no responsibility for injury to vendee or third persons proximately caused by abnormal use of the material even if reasonable safety procedures are followed. Furthermore, vendee assumes the risk in his use of the material.

### **DEFINITIONS OF TERMS**

A large number of abbreviations and acronyms appear on a MSDS. Some of these which are commonly used include the following:

CAS #: This is the Chemical Abstract Service Number which uniquely identifies each constituent.

### EXPOSURE LIMITS IN AIR:

**ACGIH** - American Conference of Governmental Industrial Hygienists, a professional association which establishes exposure limits. **TLV** - Threshold Limit Value - an airborne concentration of a substance which represents conditions under which it is generally believed that nearly all workers may be repeatedly exposed without adverse effect. The duration must be considered, including the 8-hour Time Weighted Average (**TWA**), the 15-minute Short Term Exposure Limit, and the instantaneous Ceiling Level (**C**). Skin absorption effects must also be considered.

**OSHA** - U.S. Occupational Safety and Health Administration. **PEL** - Permissible Exposure Limit - This exposure value means exactly the same as a TLV, except that it is enforceable by OSHA. The OSHA

Permissible Exposure Limits are based in the 1989 PELs and the June, 1993 Air Contaminants Rule (Federal Register: 58: 35338-35351 and 58: 40191). Both the current PELs and the vacated PELs are

indicated. The phrase, "Vacated 1989 PEL," is placed next to the PEL which was vacated by Court Order.

**IDLH** - Immediately Dangerous to Life and Health - This level represents a concentration from which one can escape within 30- minutes without suffering escape-preventing or permanent injury. **The DFG - MAK** 

is the Republic of Germany's Maximum Exposure Level, similar to the U.S. PEL. **NIOSH** is the National Institute of Occupational Safety and Health, which is the research arm of the U.S. **O**ccupational **S**afety and **H**ealth **A**dministration (**OSHA**). NIOSH issues exposure guidelines called **R**ecommended **E**xposure Levels (**REL**s). When no exposure guidelines are established, an entry of **NE** is made for reference.

### HAZARD RATINGS:

HAZARDOUS MATERIALS IDENTIFICATION SYSTEM: Health Hazard: 0 (minimal acute or chronic exposure hazard); 1 (slight acute or chronic exposure hazard); 2 (moderate acute or significant chronic exposure hazard); 3 (severe acute exposure hazard; onetime overexposure can result in permanent injury and may be fatal); 4 (extreme acute exposure hazard; onetime overexposure can be fatal). Flammability Hazard: 0 (minimal hazard); 1 (materials that require substantial pre-heating before burning); 2 (combustible liquid or solids; liquids with a flash point of 38-93 C [100-200 F]); 3 (Class IB and IC flammable liquids with flash points below 38 C [100 F]); 4 (Class IA flammable liquids with flash points below 38 C [100 F]). Reactivity Hazard: 0 (normally stable); 1 (material that can become unstable at elevated temperatures or which can react slightly with water); 2 (materials that are unstable but do not detonate or which can react violently with water); 3 (materials that can detonate when initiated or which can react explosively with water); 4 (materials that can detonate when initiated or which can react explosively with water); 3 (materials that can detonate when initiated or which can react explosively with water); 3 (materials that can detonate when initiated or which can react explosively with water); 3 (materials that can detonate when initiated or which can react explosively with water); 4 (materials that can detonate when initiated or which can react explosively with water); 3 (materials that can detonate when initiated or which can react explosively with water); 4 (materials that can detonate or pressures). PERSONAL PROTECTIVE EQUIPMENT CODES: B: Gloves, goggles, faceshield; rubber apron (appropriate body protection); X: Special attention should be given to PPE Selection.

**NATIONAL FIRE PROTECTION ASSOCIATION:** Health Hazard: **0** (material that on exposure under fire conditions would offer no hazard beyond that of ordinary combustible materials); **1** (materials that on exposure under fire conditions could cause irritation or minor residual injury); **2** (materials that on intense or continued exposure under fire conditions could cause temporary incapacitation or possible residual

injury); **3** (materials that can on short exposure could cause serious temporary or residual injury); **4** (materials that under very short exposure could cause death or major residual injury). Flammability Hazard and Reactivity Hazard: Refer to definitions for "Hazardous Materials Identification System".

### FLAMMABILITY LIMITS IN AIR:

Much of the information related to fire and explosion is derived from the National Fire Protection Association (**NFPA**). Flash Point – Minimum temperature at which a liquid gives off sufficient vapors to form an ignitable mixture with air. Autoignition Temperature: The minimum temperature required to initiate combustion in air with no other source of ignition. LEL - the lowest percent of vapor in air, by volume, that will explode or ignite in the presence of an ignition source. UEL – the highest percent of vapor in air, by volume, that will explode or ignite in the presence of an ignition source.

### TOXICOLOGICAL INFORMATION:

Possible health hazards as derived from human data, animal studies, or from the results of studies with similar compounds are presented. Definitions of some terms used in this section are: LD50 - Lethal Dose (solids & liquids) which kills 50% of the exposed animals; LC50 – Lethal Concentration (gases) which kills 50% of the exposed animals; ppm concentration expressed in parts of material per million parts of air or water; mg/m3 concentration expressed in weight of substance per volume of air; mg/kg quantity of material, by weight, administered to a test subject, based on their body weight in kg. Data from several sources are used to evaluate the cancer-causing potential of the material. The sources are: IARC - the International Agency for Research on Cancer; NTP - the National Toxicology Program, RTECS - the Registry of Toxic Effects of Chemical Substances, OSHA and CAL/OSHA. IARC and NTP rate chemicals on a scale of decreasing potential to cause human cancer with rankings from 1 to 4. Subrankings (2A, 2B, etc.) are also used. Other measures of toxicity include TDLo, the lowest dose to cause a symptom and TCLo the lowest concentration to cause a symptom; TDo, LDLo, and LDo, or TC, TCo, LCLo, and LCo, the lowest dose (or concentration) to cause lethal or toxic effects. BEI - Biological Exposure Indices, represent the levels of determinants which are most likely to be observed in

specimens collected from a healthy worker who has been exposed to chemicals to the same extent as a worker with inhalation exposure to the TLV. Ecological Information: EC is the effect concentration in water.

### **REGULATORY INFORMATION:**

This section explains the impact of various laws and regulations on the material. **EPA** is the U.S. Environmental Protection Agency. **WHMIS** is the Canadian Workplace Hazardous Materials Information System. **DOT** and **TC** are the U.S. Department of Transportation and the Transport Canada, respectively. Superfund Amendments and Reauthorization Act **(SARA)**; the Canadian Domestic/Non-Domestic Substances List **(DSL/NDSL)**; the U.S. Toxic Substance Control Act **(TSCA)**; Marine Pollutant status according to the **DOT**; the Comprehensive Environmental Response, Compensation, and Liability Act **(CERCLA or Superfund)**; and various state regulations.