

Appendix H: Accident Prevention Plan

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FINAL

23 JUNE 2021

Accident Prevention Plan Supplemental Remedial Investigation

Keyport Operable Unit 2, Area 8

Naval Base Kitsap

Keyport, Washington

Department of the Navy

Naval Facilities Engineering Systems Command

Engineering Field Activity, Northwest

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**Department of the Navy
Naval Facilities Engineering Systems Command Northwest**

Final

**Accident Prevention Plan
Supplemental Remedial
Investigation
Keyport Operable Unit 2, Area 8
NAVAL BASE KITSAP, KEYPORT, WASHINGTON**

June 2021

Prepared for NAVFAC Northwest by
AECOM Technical Services, Inc.
1111 3rd Avenue, Suite 1600
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N62742-17-D-1800
CTO N4425520F4176

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June 2021

Final APP Supplemental Remedial Investigation
 Keyport OU 2, Area 8, Naval Base Kitsap, Keyport, WA

Signature Page

REVIEW ACKNOWLEDGEMENT

By signing below, the undersigned acknowledges that he/she has read and reviewed the AECOM Technical Services, Inc. accident prevention plan for the Supplemental Remedial Investigation for Operable Unit 2, Area 8, Naval Base Kitsap Keyport. The undersigned also acknowledges that he or she has been instructed in the contents of this document, understands the information pertaining to the specified work, and will comply with the provisions contained therein.

Print Name	Signature	Organization	Field Phone Number	Date

Note: All field personnel will sign this Acknowledgement of Review prior to starting work at the project site. Copies of the current signature page will be maintained in the project folder.

CONTENTS

Review Acknowledgement	iii
Acronyms and Abbreviations	ix
a. Signature Sheet	1
1. Plan Preparer	1
2. Plan Approver	1
3. Plan Concurrence	1
b. Background Information	2
1. Contractor Name	2
2. Contract Number	2
3. Project Name	2
4. Project Information	2
4a. Project Description	2
4b. Description of Work to be Performed	3
4c. Location Map	4
4d. Equipment to be Used	4
4e. High Risk Activities	4
5. Major Phases of Work	4
c. Statement of Safety and Health Policy	9
1. Safety, Health & Environment Policy	9
2. Safety Program Goals	10
3. Safety Program Objectives	10
4. Safety Accident Experience	10
d. Responsibilities and Lines of Authority	10
1. Statement of Responsibility	10
2. Identification and Accountability	10
3. OSHA 30-Hour and Equivalent Training	14
4. Competent and Qualified Person(s)	14
5. Risk Management Process	14
6. Activity Hazard Analysis	15
7. Required Competent or Qualified Person or SSHO Presence	16
8. Policies and Procedures for Non-Compliance	16
9. Lines of Authority	16
10. Procedure for Holding Managers and Supervisors Accountable	18
e. Subcontractors and Suppliers	18
1. Identification of Subcontractors	18
2. Safety Responsibilities of Subcontractors and Suppliers	18
f. Training	19
1. New Hire Orientation Training Requirements	19
2. Project-Specific Mandatory Training Requirements and Certifications	20
3. Periodic Safety and Health Training for Supervisors and Employees	21
4. Emergency Response Training Requirements	22

<i>June 2021</i>	<i>Final APP Supplemental Remedial Investigation Keyport OU 2, Area 8, Naval Base Kitsap, Keyport, WA</i>	<i>Contents</i>
g.	Safety and Health Inspections	22
1.	Assignment of Responsibilities	22
1a.	Inspectors Identification	22
1b.	Inspector Training and Qualifications	23
1c.	Inspection Frequency	23
1d.	Procedures for Documenting Results of Inspections	23
1e.	Deficiency Tracking System and Follow-Up Procedures	23
2.	External Inspections	23
h.	Mishap Reporting and Investigation	23
1.	Exposure Data (Man-Hours Worked)	24
2.	Mishap Procedures	24
2a.	Mishap Investigations, Reports, and Documentation	24
2b.	Mishap Reporting Procedures	24
2c.	Mishap Corrective Actions	25
i.	Plans, Programs, and Procedures	28
1.	Fatigue Management Plan	28
2.	Emergency Response Plan	32
3.	Site Sanitation and Housekeeping Plan	37
4.	Medical Support Plan	38
5.	Bloodborne Pathogen Program	42
6.	Exposure Control Plan	42
7.	Automatic External Defibrillator Program	43
8.	Site Layout Plan	43
9.	Traffic Control Plan	43
10.	Hearing Conservation Program	43
11.	Respiratory Protection Plan	44
12.	Health Hazard Control Program	45
13.	Hazard Communication Program	45
14.	Process Safety Management Program	45
15.	Lead Compliance Plan	45
16.	Asbestos Abatement Plan	45
17.	Radiation Safety Program	45
18.	Abrasive Blasting Procedures	45
19.	Heat Stress Monitoring Plan	45
20.	Cold Stress Monitoring Plan	51
21.	Indoor Air Quality Management	51
22.	Mold Remediation Plan	51
23.	Chromium (VI) Exposure Evaluation	51
24.	Crystalline Silica Evaluation	51
25.	Lighting Plan for Night Operations	52
26.	Traffic Control Plan	52
27.	Fire Prevention Plan	52
28.	Wild Land Fire Management Plan	52
29.	Arc Flash Hazard Analysis	52
30.	Assured Equipment Grounding Control Program	53
31.	Hazardous Energy Control Program & Procedures	53
32.	Standard Pre-Lift Plan (Load Handling Equipment)	53
33.	Critical Lift Plan (Load Handling Equipment)	53

Final APP Supplemental Remedial Investigation
Keyport OU 2, Area 8, Naval Base Kitsap, Keyport, WA

June 2021 *Contents*

34.	Naval Architectural Analysis – Load Handling Equipment (Floating)	53
35.	Floating Plant Inspection and Certification	53
36.	Severe Weather Plan for Marine Activities	53
37.	Emergency Plan for Marine Activities	53
38.	Man Overboard and Abandon Ship Procedures	53
39.	Float Plan for Launches, Motorboats, and Skiffs	53
40.	Fall Protection and Prevention Plan	53
41.	Demolition/Renovation Plan	53
42.	Rope Access Work Plan	54
43.	Excavation and Trenching Plan	54
44.	Fire Prevention and Protection Plan for Underground Construction	54
45.	Compressed Air Work Plan for Underground Construction	54
46.	Erection and Removal Plan for Formwork and Shoring	59
47.	Precast Concrete Plan	59
48.	Lift-Slab Plans	59
49.	Masonry Bracing Plan	59
50.	Steel Erection Plan	59
51.	Explosives Safety Site Plan	59
52.	Blasting Plan	59
53.	Dive Operations Plan	59
54.	Safe Practices Manual for Diving Activities	59
55.	Emergency Management Plan for Diving	59
56.	Tree Felling and Maintenance Program	59
57.	Aircraft and Airfield Construction Safety & Phasing Plan	59
58.	Aircraft and Airfield Safety Plan Compliance Document	60
59.	Site Safety and Health Plan for Hazardous, Toxic, and Radioactive Waste	60
60.	Confined Space Entry Procedures	60
61.	Confined Space Program	60
j.	Risk Management Processes and Activity Hazard Analysis	60
k.	References	61

APPENDIXES

A	Activity Hazard Analyses
B	AECOM OSHA Form 300A
C	SSHO Authorization Letter and Employee Certifications
D	Site Safety and Health Plan
E	AECOM SH&E Standard Operating Procedures (included in field copy; excluded from reviewer copy)
F	AECOM's Global SH&E Management System Manual (included in field copy; excluded from reviewer copy)

June 2021 *Final APP Supplemental Remedial Investigation* *Contents*
Keyport OU 2, Area 8, Naval Base Kitsap, Keyport, WA

FIGURES

1	Site Location Map	8
2	Summary of AECOM Risk Management Process	15
3	Project Organizational Chart	17
4	Incident Reporting Flowchart	27
5	Hospital Route Map and Driving Directions	40
6	Medical Clinic Route Map and Driving Directions	41

TABLES

1	Competent and Qualified Person(s)	14
2	Project Personnel	16
3	Subcontractors and Suppliers	18
4	Project Training Requirements	20
5	General Inspections and Calibration Requirements	22
6	Mishap Reporting Schedule	24
7	How to Respond to Medical Emergencies	34
8	On-site Medical Support Personnel	38
9	Emergency Telephone Numbers	39
10	Adjustment Factors to Calculate Adjusted Temperature	47
11	Work-Rest Schedule Based on Adjusted Temperature	47
12	Color Standardization for Cylinders	58

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ACRONYMS AND ABBREVIATIONS

°C	degree Celsius
°F	degree Fahrenheit
AECOM	AECOM Technical Services, Inc.
AHA	activity hazard analysis
APP	accident prevention plan
bgs	below ground surface
bpm	beat per minute
CFR	Code of Federal Regulations
CLEAN	Comprehensive Long-Term Environmental Action Navy
COVID-19	Coronavirus Disease 2019
CPR	cardiopulmonary resuscitation
CTO	contract task order
CVOC	chlorinated volatile organic compound
dBa	decibel (A-weighted scale)
DFW	definable feature of work
DOT	Department of Transportation, United States
EC	emergency action coordinator
FM	field manager
H&S	health and safety
HAZWOPER	hazardous waste operations and emergency response
IDW	investigation-derived waste
NAVFAC	Naval Facilities Engineering Systems Command
Navy	Department of the Navy, United States
NRR	noise reduction rating
OSHA	Occupational Safety and Health Administration
OU	operable unit
PFAS	per- and polyfluoroalkyl substances
PID	photoionization detector
PPE	personal protective equipment
QAPP	quality assurance project plan
RAC	Risk Assessment Code
RI	remedial investigation
SH&E	Safety, Health, and Environment
SHM	safety and health manager
SOH	Safety and Occupational Health (USACE)
SOP	standard operating procedure
SOW	scope of work
SRI	supplemental remedial investigation
SSHO	site safety and health officer
SSHP	site safety and health plan
TWA	time-weighted average
U.S.	United States

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a. Signature Sheet

**Final Accident Prevention Plan
Supplemental Remedial Investigation
Keyport Operable Unit 2, Area 8
Naval Base Kitsap, Keyport, Washington
Contract No. N62742-17-D-1800
Contract Task Order No. N4425520F4176**

1. PLAN PREPARER

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3. PLAN CONCURRENCE



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Date: 6/23/2021

b. Background Information

The purpose of this accident prevention plan (APP) is to establish site-specific safety and health procedures, practices, and equipment requirements to protect affected personnel, in particular AECOM Technical Services, Inc. (AECOM) employees and its subcontractors, and visitors to the site from the potential hazards associated with the field activities for the Supplemental Remedial Investigation (SRI) for Operable Unit (OU) 2, Area 8, Naval Base Kitsap (NBK) Keyport. This APP assigns responsibilities, establishes standard operating procedures (SOPs), and provides for contingencies that may arise during field activities. This APP interfaces with AECOM's Safety, Health, and Environment (SH&E) Program.

All work will be performed in accordance with applicable federal, state, and local Safety and Occupational Health (SOH) laws and regulations, including Occupational Safety and Health Administration (OSHA) standards (codified at 29 Code of Federal Regulations [CFR] 1910 and 29 CFR 1926) and the United States (U.S.) Army Corps of Engineers *Safety and Health Requirements Manual*, Engineering Manual (EM) 385-1-1 (USACE 2014).

The requirements established by this APP are mandatory for all AECOM employees and subcontractors and any other person entering designated work areas at the project site during active field operations. AECOM shall provide a copy of this plan, if requested, to any authorized person who enters the regulated work area.

In accordance with risk management procedures established by AECOM's SH&E policy and EM 385-1-1 (USACE 2014), this project carries an overall activity hazard analysis (AHA) Risk Assessment Code (RAC) of 3 (Moderate).

1. CONTRACTOR NAME

AECOM Technical Services, Inc.

2. CONTRACT NUMBER

- Comprehensive Long-Term Environmental Action Navy (CLEAN) IV Program Contract Number: N62742-17-D-1800
- Contract Task Order (CTO) Number: N4425520F4176

3. PROJECT NAME

Site Assessment at the Keyport Operable Unit (OU) 2, Area 8, Naval Base Kitsap (NBK) Keyport.

4. PROJECT INFORMATION

4a. Project Description

Human health and ecological risk assessments were recently completed at the beach adjacent to NBK Keyport OU 2 Area 8, referred to as the "Area 8 Beach", as required by the OU 2 Record of Decision. These risk assessments confirmed no risk to human health. However, risk to benthic invertebrates (clams) associated with sediment contamination originating from Area 8 groundwater contamination has been identified on the adjacent beach. The OU 2 ROD specifies that, if a risk is identified, "groundwater controls" will be instituted, and presents six options for controlling groundwater at the site. However, none of the options presented are technically feasible due to the tidally influenced nature of the site.

The intent of this SRI at NBK Keyport OU 2 Area 8 to gain a better understanding of current site conditions and site hydrogeology in support of future remedial alternative selection to mitigate site contamination from seeping onto the adjacent beach. Sampling for per- and polyfluoroalkyl substances (PFAS) will be limited to identifying the magnitude and extent of PFAS concentrations at the site to aid in evaluation of remedial alternatives to ensure PFAS concentrations will not create unwanted byproducts or otherwise adversely impact the remedy.

4b. Description of Work to be Performed

The objective of this scope of work (SOW) is to complete a supplemental remedial investigation (RI). The information needed to achieve this work is:

1. Salt-water wedge geometry and depth below the terrestrial portion of the site. A geophysical survey will be performed to map the lateral and vertical extent of the salt-water wedge. In addition, conductivity measurements in the adjacent surface water, existing wells and the at regular depth intervals in borings for new wells during advance. This will help to refine delineation of the saltwater wedge.
2. Physical soil properties total organic carbon, permeability, porosity, density, and grain size.
3. The lateral and vertical extent of chlorinated volatile organic compounds (CVOCs) including trichloroethylene, metals (arsenic, cadmium, chromium, lead, nickel, silver, and zinc), and 1,4-dioxane in soil.
4. The extent of CVOC, select semivolatile organic compounds, metals (arsenic, cadmium, chromium, lead, nickel, silver, and zinc), 1,4-dioxane, and PFAS in groundwater.
5. Prepare work plans, a quality assurance project plan (QAPP) and an APP/site safety and health plan (SSHP).
6. Prepare a supplemental SRI report to support future remedial alternative selection to stop site contamination from seeping onto the adjacent beach at OU 2, Area 8.

In summary, the SOW includes:

- Planning the execution of the project, including a site visit for key staff and a kickoff meeting
- Performing project management tasks
- Reviewing available data
- Update the conceptual site model using all available to support selection of sampling and lithologic data collection locations
- Preparing project plans including an APP/SSHP, and a QAPP
- Preparing technical SOWs for subcontractor services (i.e., drilling, mediation/facilitation services, analytical laboratories, and data validation)
- Performing the field investigation including a geophysical survey, well installation, soil and groundwater sample collection, and a horizontal and vertical survey of all new sample collection locations
- Performing chemical analysis and data validation and evaluation
- Conducting data management and uploading data to Naval Installation Restoration Information Solution

- Preparing a supplemental RI report, which will include reporting of field investigation results
- Participating in meetings with U.S. Department of the Navy (Navy), regulatory agencies, and stakeholders

4c. Location Map

See Figure 1 for the project location map.

4d. Equipment to be Used

Equipment to be used on-site is expected to include the following:

- Hand tools including wrenches, utility knives, and polyvinyl chloride pipe cutters
- Vegetation clearance tools (e.g., weed eaters, chainsaws, machetes, etc.)
- Digging tools (e.g., shovels, picks) for installation of access gate
- Soil sampling equipment (e.g., split spoons, scoops, TerraCore samplers)
- Direct-push sampling equipment
- Sonic Drill rig for well installation and development
- Bladder pump, controller, and tubing for groundwater sampling
- Water quality meter
- Oil/Water interface meter
- Photoionization detector (PID)
- Dust monitor
- Noise dosimeter
- Bobcat for moving drilling supplies and equipment
- Drum concrete mixer
- Submersible pressure transducers with built-in dataloggers
- Geophysical surveying equipment and instrumentation
- Land surveying equipment and instrumentation

4e. High Risk Activities

No high risk activities are anticipated.

5. MAJOR PHASES OF WORK

The major phases of work, including definable features of work (DFWs) and associated tasks, are described in the following subsections.

Fieldwork will be conducted in three phases:

- Phase 1 comprises a geophysical survey, depth-to-water and saltwater wedge monitoring via down-hole transducers and down-hole conductivity sensors in select existing wells connected to a data logger.
- Phase 2 comprises soil and groundwater sampling using direct-push drilling methods. Sampling locations will be contingent on Phase 1 results.
- Phase 3 comprises groundwater monitoring well installation using sonic drilling methods. Installation locations will be contingent on Phase 1 and 2 results.

Site Visit/Utility Location

A site visit will be performed in preparation for drilling and sampling activities. Personnel will identify locations where potentially hazardous conditions exist, identify potential boring locations, assess the geological features of the site, and visually inspect the site for other potential hazards.

Subsurface utilities in the planned sampling/drilling locations will be located. Planned sampling and drilling locations will be adjusted based on the location of identified subsurface utilities. Utilities in areas adjacent to planned sampling/drilling locations will also be located to provide flexibility.

Vegetation Clearance

The investigation area is highly developed so vegetation clearance is not anticipated.

Access Pathway and Drilling Pad Construction

The investigation area is highly developed so access paths and drilling pads are not required.

Access Gate Construction

The investigation area is within a Navy secured facility so gate construction is not required.

Subsurface Utility Clearance and Geophysical Survey

A subsurface utility clearance and geophysical survey at proposed drilling locations using non-intrusive techniques (e.g., magnetic, electromagnetic, and ground penetrating radar) will be conducted by a qualified subcontractor prior to intrusive activities to determine the locations of underground utilities and anomalies in accordance with Procedures I-A-5, *Utility Clearance* and I-B-2, *Geophysical Testing* (Navy 2015).

Drilling and Subsurface Soil Sample Collection

An anticipated total of twenty three direct push soil borings are expected to be advanced at the site. The exact locations will be determined in the field. Each soil boring will be drilled using direct push drilling methods in accordance with Procedure I-F, *Direct Push Sampling Techniques* (Navy 2015). Boreholes will be advanced up to approximately 50 feet below ground surface (bgs). Prior to any drilling, a hand auger or other hand tool will be used to manually advance the borehole to 5 feet bgs to ensure the location is cleared of utilities. Subsurface soil samples will be collected for lithological characterization and chemical analyses. Cuttings removed from the boreholes will be collected in 55-gallon drums. If drilling refusal occurs prior to reaching the target depth, boreholes may be abandoned by sealing the borehole with bentonite.

Monitoring Well Installation and Development

An anticipated total of eleven groundwater monitoring wells will be installed to evaluate groundwater conditions at the site. Monitoring wells will be installed and developed in accordance with

Procedure I-C-1, *Monitoring Well Installation and Abandonment* (Navy 2015) and Procedure I-C-2 *Monitoring Well Development* (Navy 2015). The groundwater surface is expected to be encountered at approximately 3 to 20 feet bgs. Depth-to-groundwater as distance from the adjacent marine water body increases. The wells will be completed flush-to-ground surface with an 8-inch-diameter steel protective casing. Monitoring wells will be developed after completion. Well development will consist of a combination of surging and bailing techniques and pumping groundwater with a submersible pump until fine sediment particles have been removed and the water clarifies. A dedicated bladder pump will be installed in the wells.

Land Survey

A licensed land surveyor will survey the location and surface elevation of groundwater monitoring wells, soil boring locations, and other pertinent site features using conventional surveying techniques in accordance with Procedure I-I, *Land Surveying* (Navy 2015).

Soil Sample Collection

Soil samples will be collected as described in the project-specific QAPP (Navy 2021).

Groundwater Sample Collection

Groundwater samples will be collected from all newly installed wells and a number of existing wells as described in the project-specific QAPP (Navy 2021).

Synoptic Water Level Survey

Synoptic groundwater level data will be collected using transducers installed in approximately eight monitoring locations within and around Area 8. Down-hole water level and quality data loggers (pressure transducers) will be deployed at fixed elevations at the selected monitoring points and programmed to continuously record groundwater level (pressure) and temperature data. The data loggers will be checked routinely to ensure that they are functioning properly and that the groundwater levels are accurate.

Investigation-Derived Waste Management

All investigation-derived waste (IDW) work will be performed in accordance with Procedure I-A-6, *IDW Management* (Navy 2015). IDW (soil cuttings, purge water, and decontamination fluids) will be contained in U.S. Department of Transportation (DOT) approved 55-gallon drums and staged at a location specified by NBK Keyport personnel. All IDW will be characterized per NBK Keyport requirements and provided to the identified installation personnel. Final waste disposal will be determined and executed by NBK Keyport personnel. Normal trash will be disposed of daily.

Field Work During Coronavirus Disease 2019 Pandemic

AECOM has adopted a risk-based approach to managing exposure to Coronavirus Disease 2019 (COVID-19) for offices and projects. This is based on guidance from the World Health Organization, U.S. Centers for Disease Control and Prevention, U.S. OSHA, U.S. Environmental Protection Agency, and other government agencies. Staff will follow any regional communications issued for the latest

advice. COVID-19 procedures, as outlined in this APP, will be strictly followed by all AECOM and subcontractor personnel. General measures to help prevent the spread of disease include:

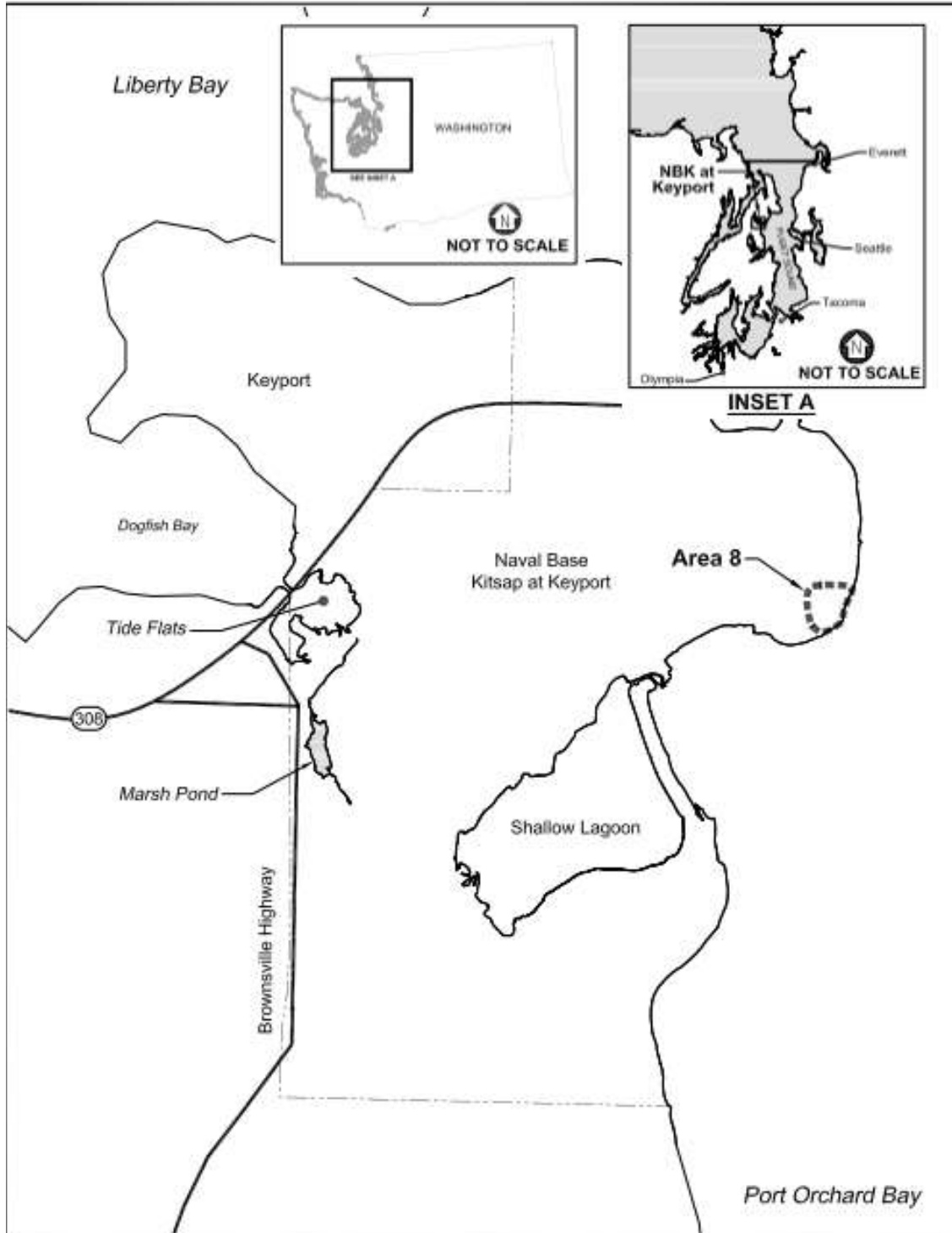
- Stay informed on the latest developments about COVID-19 and follow advice given by your healthcare provider, your national and local public health authority, and AECOM on how to protect yourself and others from COVID-19.
- Wash hands frequently with soap and water or use an alcohol-based hand rub (containing at least 60 percent alcohol) if your hands are not visibly dirty. Personnel will have access to hand sanitizer at all times during field work.
- Practice respiratory hygiene. When coughing and sneezing, cover mouth and nose with flexed elbow or tissue. Discard tissue immediately into a closed bin and clean your hands with alcohol based hand rub or soap and water.
- To the greatest extent possible, maintain social distancing of at least 2 meters (6 feet) between yourself and other people, particularly those who are coughing, sneezing, or showing any other signs of potential illness.
- Wear a face mask if site conditions make social distancing impossible and you must break the 2 meter (6 foot) social distancing procedure.
- Avoid touching eyes, nose, and mouth.
- Stay home if you feel unwell. If you have a fever, cough, or difficulty breathing, seek medical attention and call in advance. Follow the directions of your local health authority.
- If you have recently visited (past 14 days) areas where COVID-19 is spreading, stay at home, especially if you begin to feel unwell, even with mild symptoms such as headache and slight runny nose, until you recover.

Tasks Requiring Hazard Analysis (AHA)

DFWs within these major phases that require AHAs are presented below. AHAs are provided in Appendix A.

- Site visit and mobilization
- Subsurface utility clearance and geophysical survey
- Down-hole tools and data-logger deployment
- Drilling operations, well installation and subsurface sampling
- Monitoring well development
- Land survey
- Soil sampling
- Groundwater sampling
- IDW management
- Precautions for COVID-19
- Site restoration and demobilization

Figure 1: Site Location Map



c. Statement of Safety and Health Policy

1. SAFETY, HEALTH & ENVIRONMENT POLICY



Safety, Health & Environment Policy

Purpose

This policy establishes the framework to attain best-in-class Safety, Health and Environmental (SH&E) performance in the interest of benefitting AECOM's employees and stakeholders in the global marketplace.

Policy

AECOM is committed to exceptional levels of performance in safeguarding people and the environment as one of our Core Values. In recognition of the right to a safe and healthy working environment, keeping our people and stakeholders safe is our most important measure of success. We strive to be the beacon of safety excellence in the industries and global communities in which we work.

To advance our SH&E program, we are committed to:

- Zero work-related injuries to AECOM employees and stakeholders, and protection of the environment as a result of our activities.
- Providing a safe and healthy work environment, and a highly effective SH&E management system that drives continual review and improvement.
- Meeting client requirements and properly incorporating all applicable safety, health and environmental legal requirements and regulations at the local, state, provincial and national levels.
- Developing an exceptional safety culture where our people and stakeholders embrace ownership for the safety of themselves and others.
- Advancing our goals of pollution prevention, resource conservation and environmental sustainability.
- Setting and meeting aggressive SH&E performance goals and Core Value Metrics to promote continuous improvement.
- Working with employees and business partners in order to continuously improve SH&E performance.
- Recognizing and celebrating those who contribute to excellent SH&E performance.
- Striving to make AECOM the provider of choice for the safe execution of design, build, finance, operate and maintenance work globally.

The commitment to this policy by the leadership, management and employees of AECOM provides the foundation for a safe workplace, operational excellence and long-term business success.

Expectations

Safety is a core value and a key to our success. We demand continuous improvement in our journey toward a "zero" incident culture, where everyone is committed to safety, health and environmental excellence.


To that end, we demand our leaders, managers, supervisors, employees, and subcontractors:

- Demonstrate their commitment in their actions and decisions to assure that every person goes home safe every day.
- Embrace safety as a core value both on and off the job.
- Commit to his/her own safety and that of his/her fellow employees.
- Incorporate AECOM's Life-Preserving Principles into work planning and execution.
- Proactively and aggressively identify, manage and eliminate hazards and reduce risk in the workplace.
- Engage in training and preparations to have the knowledge, skills, competency and equipment required to work safely.
- Take action to stop work if the work cannot be executed safely or if conditions or behaviors on the work activity are unsafe.
- Immediately report safety, health and/or environmental incidents, near-misses, unsafe conditions, and at-risk behaviors to their supervisor; and that we diligently work to correct the problem.

Our SH&E expectations will be accomplished by the demonstrated leadership of management, compliance with regulatory requirements, and consultation with and participation of AECOM personnel.

Review and Communication

This Policy will be reviewed annually to ensure it meets the needs of the company, and will be made available and communicated to all persons under the control of the company.



Troy Rudd
Chief Executive Officer

August 28, 2020

Date

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Safety, Health & Environment Policy (S1-001-PL1)
Revision 7 August 28, 2020
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2. SAFETY PROGRAM GOALS

AECOM's SH&E goal is to operate ethically and with integrity, while prioritizing safety and security in all that we do.

3. SAFETY PROGRAM OBJECTIVES

AECOM's SH&E goals include:

- ZERO work-related injuries, illnesses, or accidents
- ZERO damage to property, and equipment from AECOM activities
- ZERO adverse impact to the environment from AECOM ongoing projects

4. SAFETY ACCIDENT EXPERIENCE

A copy of AECOM's OSHA 300 Form is included in Appendix B.

d. Responsibilities and Lines of Authority

1. STATEMENT OF RESPONSIBILITY

AECOM is ultimately responsible for the implementation and strict enforcement of the SH&E Program for this project's specific scope, covering all AECOM employees, subcontractors, and visitors to AECOM-controlled work areas. No person may work in a manner that conflicts with the intent of, or the inherent safety and environmental precautions expressed in, the procedures.

Project and field-level management of health and safety (H&S) requires that a management organization be established for each project. The organizational structure is standard for each AECOM project and is available in the work plan. The organizational structure consists of the following positions and responsibilities.

2. IDENTIFICATION AND ACCOUNTABILITY

CLEAN V Program Director (Mr. Robin Cababa)

The program director is responsible for ensuring that CTO managers are provided with adequate programmatic guidance, resources, and support to enable safe planning and performance of field operations. While programmatic management and technical support are the responsibility of the safety and health manager (SHM), the program director is ultimately responsible for ensuring that work activities are performed safely.

Regional Safety and Health Manager (Mr. Devon Molitor)

The regional SHM for this project is a Certified Safety Professional and is assigned to oversee H&S requirements for the delivery order and to provide technical support. The regional SHM is accountable for the following:

- Assisting with staffing, technical support, plan development, and regulatory guidance.
- Approving designated site safety and health officers (SSHOs) and Competent or Qualified Persons.
- Communicating safety and health expectations and flow down requirements for subcontractor statements of work.
- Providing regional level supervision for the site SSHO.

- Identifying training requirements for personnel.
- Assisting in the development of on-site training, which will be provided by the SSHO.
- Developing this APP and the SSHP contained in Appendix D.
- Providing consultation as needed to ensure that this APP and the SSHP are fully implemented.
- Coordinating and delegating CTO SH&E duties to the SSHO.
- Identifying OSHA-defined Competent Person(s) as required per task.
- Visiting the project site, as needed, to review the effectiveness of the APP and SSHP.
- Being available for project guidance in the event of a project H&S emergency.
- Developing revisions to the APP and SSHP, as needed.
- Reviewing all personal exposure monitoring results.
- Evaluating occupational exposure monitoring and ambient air sampling data and adjusting APP requirements when necessary.
- Training project SSHOs in the use of personal and area air monitoring equipment.
- Participating in the investigation of reported unsafe acts or work incidents, as necessary.

CTO Manager (Greg Burgess)

The CTO manager for this project is responsible for coordinating with local Navy representatives, regional SHM, SSHO, field manager (FM), and subcontractors to complete the project in accordance with requirements set forth in this APP or other project H&S documentation. The CTO manager is responsible for managing all aspects of the work operations and for the safe performance and completion of the work activities. Specific safety-related duties include the following:

- Ensuring overall responsibility and accountability for adherence to this APP and for the safety of personnel and equipment under the CTO manager's direction while conducting the SOW.
- Providing leadership by establishing an environment that fosters a positive safety culture.
- Managing and coordinating all work performed by AECOM and its subcontractors in accordance with the provisions set forth in this APP.
- Ensuring that the APP is approved and provided to all stakeholders prior to commencing field operations.
- Ensuring that project resources have been allocated to implement the SOH program (i.e., personal protective equipment [PPE], equipment and instruments, and other safety-related items).
- Ensuring that subcontractor Statements of Work include appropriate safety provisions and expectations.
- Ensuring that safety and health requirements are covered during kickoff meetings.
- Participating in the investigation of unplanned events, high loss potential incidents, and accidents, and ensuring that they are properly reported to Naval Facilities Engineering Systems Command (NAVFAC) Northwest and within the AECOM H&S reporting network.

- Notifying the local SHM of any changes in the SOW or site conditions, and ensuring that the APP is updated to address any new hazards.
- Immediately stopping operations in the event of an emergency or serious hazard to protect personnel and the environment.

Site Safety and Health Officer (Ms. Josie Smith)

The SSHO is responsible for managing, implementing, and enforcing this APP. Additionally, the SSHO is accountable for the following:

- Ensuring that all work plans and the SOH Program are being implemented.
- Communicating on a weekly basis with the SHM.
- Supporting the CTO manager in meeting all requirements of the APP.
- Equally enforcing the safety and health expectations and flow down requirements for AECOM and its subcontractors.
- Ensuring that all required notifications regarding incident reporting are completed in accordance with EM 385-1-1.
- Identifying a Designated Representative for the project as needed, including when absent from the site for more than 24 hours.
- Being on-site or having a Designated Representative onsite at all times when work is being performed.
- Discussing potential SOH hazards with the FM, local SHM, and CTO manager and coordinating any required modifications to the safety plans with the CTO manager, local SHM, and the Navy.
- Reviewing medical clearance and training certificates of all site personnel.
- Maintaining training certificates on-site as required.
- Being present or having a Designated Representative present during all operations to oversee implementation of the APP.
- Performing daily site inspections to identify H&S issues, implement corrective measures, and observe site personnel at work. Site safety inspections will be documented in the field logbook.
- Conducting periodic safety reviews of the project site and project documentation.
- Stopping work to maintain personal and environmental H&S when necessary.
- Establishing communications with all potential emergency response organizations.
- Acting as the emergency action coordinator (EC) in the event of an emergency.
- Establishing the necessary controlled work areas, as designated by the APP and SSHP.
- Conducting project-specific training, including daily tailgate safety meetings at the beginning of the work shift with all on-site personnel and subcontractors. Maintaining training attendance logs and records.

Qualifications

Ms. Smith has more than 20 years of environmental experience and more than 1 year of experience serving as an SSHO for similar field efforts.

Ms. Smith's training and certifications include, but are not limited to:

- EM 385-1-1 Construction Safety Hazard Awareness Training for Contractors
- 40-hour Hazardous Waste Operations and Emergency Response (HAZWOPER) training
- 8-hour HAZWOPER annual refresher
- 8-hour HAZWOPER supervisor training
- First aid and cardiopulmonary resuscitation (CPR) certified

Copies of Ms. Smith's training certificates are provided in Appendix C.

Should additional SSHOs be required to cover multiple or simultaneous events, and alternate SSHO with equivalent experience will be used.

Field Manager (Mr. Nathan Gwyn)

The FM is responsible for managing all AECOM and subcontractor activities at the site and for field implementation of the specified H&S requirements. This includes communicating site requirements to all personnel, ensuring that field supervisors and subcontractors enforce all provisions of the APP and other relevant H&S documentation, working with the SSHO to implement all H&S performance elements, and consulting with the SHM regarding necessary changes to H&S requirements. Other responsibilities include:

- Becoming familiar with the APP.
- Establishing communications with all potential emergency response organizations.
- Serving as the site Designated Representative as necessary, including when the SSHO is offsite for more than 24 hours.
- Enforcing the APP and other safety regulations.
- Ensuring that no work is performed that is not properly addressed in this APP (or approved supplemental guidance).
- Maintaining the presence of at least two qualified first aid and CPR providers on-site at all times.
- Maintaining decontamination procedures that meet criteria established in the SSHP.
- Contacting the SHM for guidance regarding H&S-related matters.

Qualifications

Mr. Gwyn's training and certifications include:

- 30-hour OSHA construction safety course
- 40-hour HAZWOPER training
- 8-hour HAZWOPER annual refresher
- 8-hour HAZWOPER supervisor training
- First aid and CPR certified

Copies of Mr. Gwyn's training certificates are provided in Appendix C.

3. OSHA 30-HOUR AND EQUIVALENT TRAINING

OSHA 30-hour training is treated as a required qualification in this APP. Consequently, no equivalent training need be developed in this section.

4. COMPETENT AND QUALIFIED PERSON(S)

Specific DFWs have been identified as requiring oversight by a Competent or Qualified Person. Table 1 identifies these DFWs and the individuals designated as Competent or Qualified Persons for the specific task. Subcontractors are not known at this time but will be submitted for acceptance prior to the start of work.

Table 1: Competent and Qualified Person(s)

DFW	Area of Competency	Company/Position	Name
HAZWOPER operations: <ul style="list-style-type: none"> • Soil sampling • Well gauging • Soil and groundwater sampling • Equipment decontamination • Managing IDW and disposal 	HAZWOPER	AECOM/SSHO AECOM/FM	Josie Smith, Nathan Gwyn, Anthony Palmieri, Demetrio Cabanillas
Drilling operations	Heavy equipment/ Geology/Sampling	Holt Drilling (subcontractor)/ Geologists (AECOM)	Dale Abernathy (subcontractor)/ Nathan Gwyn, Stuart Holmes, Anthony Palmieri
Monitoring well installation and development	Heavy equipment	Holt Drilling (subcontractor)/ Geologists (AECOM)	Dale Abernathy (subcontractor)/ Nathan Gwyn, Stuart Holmes
Geophysical Surveying	Specialized	AECOM	Steve Husted
Utility Locating	Utility Locating	APS (subcontractor)	Bill Phillips (subcontractor)
Land Surveying	Surveying	Bush, Roed, and Hitchings (BRH) (subcontractor)	Taylor Schulte
IDW Management	Heavy equipment	Holt Drilling (subcontractor)	Dale Abernathy (subcontractor) Nathan Gwyn, Stuart Holmes

APS Applied Professional Services

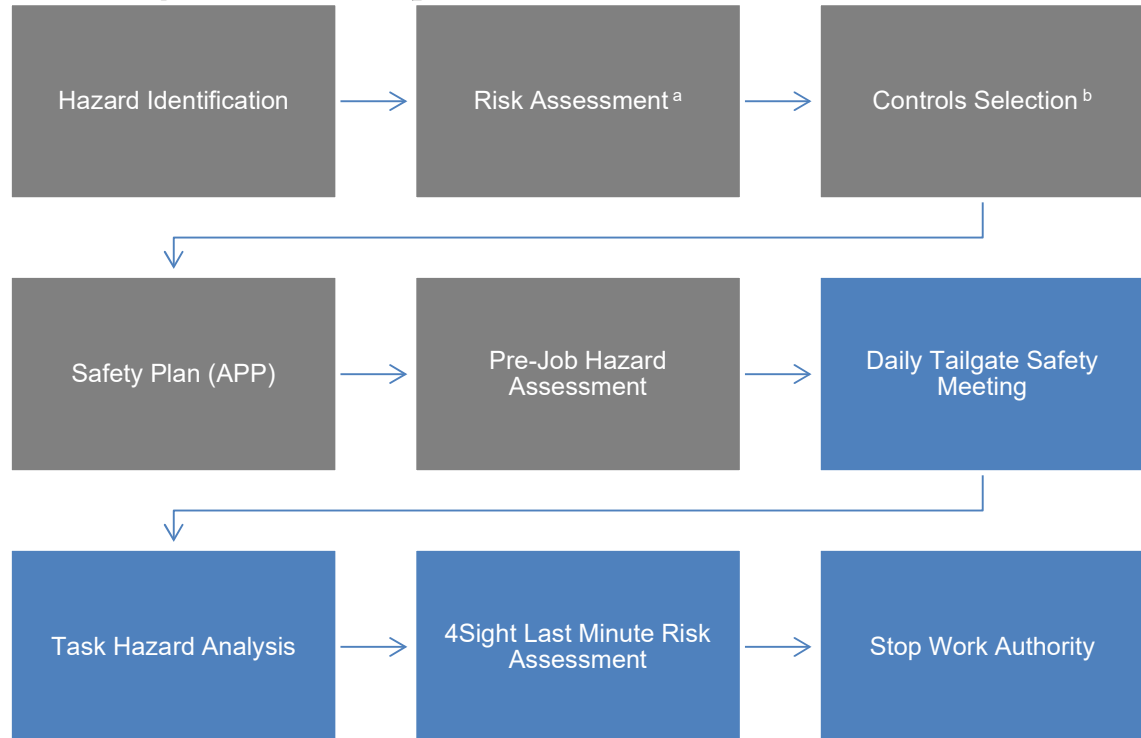
AECOM and its subcontractors will not perform any work on-site without the presence of the respective Competent Person as indicated in Table 1. Each subcontractor must provide in writing that the individuals are designated as Competent Persons on their company letterhead. This documentation will be maintained on-site.

5. RISK MANAGEMENT PROCESS

AECOM’s risk management process is carried out in accordance with EM 385-1-1, Section 01.A.12 (USACE 2014); OSHA regulations 29 CFR 1910.1200 *Hazard Communication*, 29 CFR 1926.35 *Employee Emergency Action Plans*, Injury & Illness Recordkeeping Forms 300 and 301, and Process Safety Management Standard; and AECOM SH&E SOP S3AM-209-PR1, *Risk Assessment and Management* (Appendix E). These standards and regulations detail the requirements for risk identification, risk evaluation, adoption of control measures, and safety documentation to manage SH&E risks associated with AECOM work activities. The objective is to establish and enhance SH&E performance, mitigate and reduce losses, and maintain regulatory compliance. Figure 2 provides a

summary of the steps in the AECOM risk management process. Grey boxes indicate the planning steps during preparation of field work; blue boxes represent steps taken in the field during field work.

Figure 2: Summary of AECOM Risk Management Process



^a The risk assessment method used by AECOM requires an evaluation of the severity and probability of any identified hazard. This is generally based on experience although incident statistics are available for most industries. A probability assessment must also take into consideration the frequency of exposure to a particular hazard (e.g., the probability of occurrence is much greater if the activity is a daily event involving a number of individuals than if the same activity was carried out twice a year by only a few individuals as part of a maintenance procedure). The AECOM Risk Matrix is used to standardize risk levels.

^b Control methods are selected based on the hierarchy of controls with elimination of the hazard as the preferred method of control, followed by substitution (replacing the hazard), engineering controls, and administrative controls. PPE is selected only when all other methods are determined not to be feasible.

6. ACTIVITY HAZARD ANALYSIS

During the pre-job hazard assessment, AHAs are developed by the field teams or organizations that are performing the work. AHAs are to be submitted to, and accepted by, the Navy remedial project manager (RPM) during preparatory meetings prior to the commencement of field work. AHAs are submitted in a format equivalent to EM 385-1-1 Section 01.A.12 (USACE 2014), and include the following information:

- RAC per AECOM's Risk Matrix
- Name of Competent or Qualified Person, if required for the activity
- Job steps, hazards associated with each step, and controls implemented to reduce risk
- Training and inspection requirements

- Required safety equipment and PPE
- Acknowledgment by AECOM personnel and subcontractors performing the task

In the field, AECOM personnel and subcontractors will conduct a thorough review of the AHA for a specific task. At this time, the field team may add to the AHA. If the initial RAC for the activity is escalated due to changes in the AHA, then the AHA will be resubmitted for acceptance by the Navy RPM prior to the start of work.

DFWs that require AHAs are listed in Section b.5; AHAs are provided in Appendix A.

Overall Project RAC: 3-Moderate

7. REQUIRED COMPETENT OR QUALIFIED PERSON OR SSHO PRESENCE

No work shall be performed unless the SSHO or qualified, designated alternate and the Competent or Qualified Person required for the activity are present at the job site.

8. POLICIES AND PROCEDURES FOR NON-COMPLIANCE

AECOM management takes a serious approach to employee non-compliance with safety requirements. Personnel not following procedures are warned and counseled on the proper safety procedures. If the problem persists, the employee is counseled again and the behavior is noted in their permanent record. Continued non-compliance can lead to termination of employment. On AECOM sites, visitors are briefed about site safety requirements and are provided with the appropriate level of PPE. If visitors refuse to follow these procedures, they are escorted from the site and refused re-entry.

9. LINES OF AUTHORITY

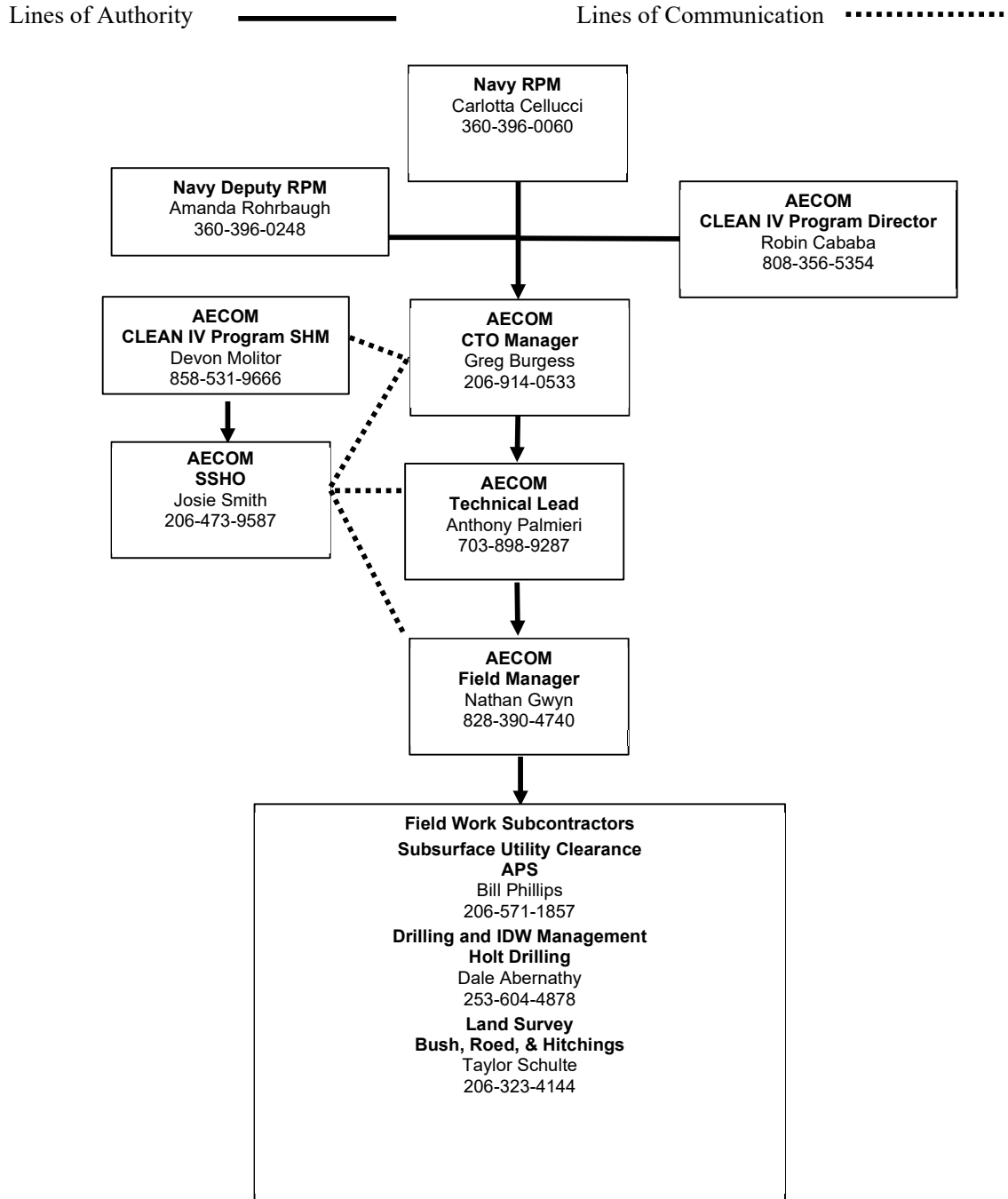
Table 2 presents the project personnel, their job title and role in the project, affiliation, and contact information.

Table 2: Project Personnel

Name	Title	Organization	Telephone	E-mail
Carlotta Cellucci	RPM	Navy	360-396-0060	carlotta.cellucci@navy.mil
Amanda Rohrbaugh	Deputy RPM	Navy	360-396-0248	amanda.rohrbaugh@navy.mil
Steve Skeeahan	Navy Technical Representative	Navy	253-279-0212 (cell)	Steve.skeeahan@navy.mil
Devon Molitor	CLEAN IV SHM	AECOM	858-531-9666	devon.molitor@aecom.com
Robin Cababa	CLEAN IV Program Director	AECOM	808-356-5354	robin.cababa@aecom.com
Greg Burgess	CTO Manager	AECOM	206-914-0533 (cell)	greg.burgess@aecom.com
Anthony Palmieri	Deputy CTO Manager/Technical Lead	AECOM	703-898-9287 (cell)	anthony.palmieri@aecom.com
Josie Smith	SSHO	AECOM	206-473-9587 (cell)	josie.smith@aecom.com
Nathan Gwyn	FM	AECOM	828-390-4740 (cell)	nathan.gwyn@aecom.com
Bill Phillips	Utility Clearance Subcontractor	APS	206-571-1857	bphillips@apslocates.com
Dale Abernathy	Drilling and Monitoring Well Installation Subcontractor	Holt Drilling	253-604-4878	dabernathy@holtserviceinc.com
Taylor Schulte	Land Survey Subcontractor	Bush, Roed, & Hitchings	206-323-4144	taylors@brhinc.com

Figure 3 provides an organizational chart displaying project personnel lines of authority and contact information.

Figure 3: Project Organizational Chart



10. PROCEDURE FOR HOLDING MANAGERS AND SUPERVISORS ACCOUNTABLE

AECOM’s commitment to safety and health is well-documented and is required of a job applicant from the time an offer is made. Managers and supervisors are responsible for enforcing safety and health as part of their job description. They are ultimately responsible for protecting the welfare of site personnel, as well as minimizing liability associated with on-the-job accidents.

All AECOM employees are subject to the disciplinary policy. Additionally, supervisors and managers are held accountable through AECOM’s annual Employee Performance Review Process.

e. Subcontractors and Suppliers

1. IDENTIFICATION OF SUBCONTRACTORS

The subcontractors performing work on this project are shown in Table 3.

Table 3: Subcontractors and Suppliers

Service	Subcontractor	Contact Number
Subsurface utility location	APS	206-571-1857
Drilling/Sampling	Holt Drilling	253-604-4878
Land survey	Bush, Roed, & Hitchings	206-323-4144
Rental equipment and supplies	Pine Environmental	425-485-9102
Rental equipment and supplies	Field Environmental Instruments	425-398-5600

2. SAFETY RESPONSIBILITIES OF SUBCONTRACTORS AND SUPPLIERS

As AECOM is ultimately responsible for the implementation of the SH&E Program, the subcontractor’s activities have been incorporated into this APP. Subcontractors have special responsibilities in the SH&E Program, which are outlined in AECOM SH&E SOP S3AM-213-PR1, *Subcontractor Management* (Appendix E):

- At no time will subcontractors, their employees, or representatives enter the project site(s) for any reason without verbally notifying the SSHO.
- Subcontractors that perform work for AECOM under this APP will be trained on the APP, participate in daily tailgate safety meetings, conduct worksite inspections, report and correct hazards, and report all incidents including near misses (close call incidents that could otherwise have resulted in injury, illness, or damage) to AECOM.
- All AECOM site personnel, including subcontractors, have Stop Work Authority to halt any activity on-site perceived to be unsafe.
- Hazards not listed in this APP but known to any subcontractor, or known to be associated with a subcontractor’s services, must be brought to the attention of the AECOM CTO manager or SSHO and addressed in an AHA prior to beginning work operations. Activities that are High Risk may require additional approvals prior to starting work.
- Each subcontractor’s management will provide qualified employees and allocate sufficient time, materials, and safety equipment to safely complete assigned tasks. In particular, each subcontractor is responsible for equipping its personnel with any required PPE and all required training for specialized tasks that the subcontractor is hired to perform. Prior to starting work, within 7 days of start date, subcontractors are required to submit training, experience,

certifications, plans, procedures, and other supporting documents to AECOM to verify all qualifications.

- Requirements for heavy equipment subcontractors include:
 - Competent person qualifications (heavy equipment) for drill rig operator
 - *Machinery and Mechanized Equipment Certification Form*
 - Daily completion of AECOM SH&E SOP form S3AM-309-FM2, *Heavy Equipment Pre-Operation Checklist*
 - Daily completion of AECOM SH&E SOP form S3AM-321-FM1, *Daily Drilling, Boring & Direct-Push Equipment Inspection*
- Should any of the subcontractor's procedures or requirements conflict with those specified in this APP, the more stringent will be adopted.
- The AECOM SSHO or Designated Representative has the authority to remove any subcontractor (or any one employed under or subcontracted to the subcontractor) from the site for failure to comply with established H&S procedures or for operating in an unsafe manner.

The AECOM SSHO or Designated Representative will be in the field during operations to ensure that the subcontractor complies with AECOM's safety requirements. Copies of safety documentation for the subcontractor's work tasks will be provided to AECOM for review prior to the start of on-site activities.

f. Training

AECOM site workers are subject to the training requirements presented in this APP.

1. NEW HIRE ORIENTATION TRAINING REQUIREMENTS

New employees are at greater risk for workplace injuries due to their unfamiliarity with AECOM's H&S policy and procedures. Mandatory SOH orientation training for new AECOM employees is conducted in accordance with EM 385-1-1, Section 01.B (USACE 2014) and AECOM SH&E SOP S3AM-003-PR1, *SH&E Training* (Appendix E).

The training covers the following:

- AECOM's commitment to safety.
- Each employee's responsibility for maintaining a safe working environment.
- AECOM's SH&E policy, which includes:
 - Monitoring and evaluation of the training program by leadership on an ongoing basis.
 - Availability of current AECOM policies and procedures on the AECOM intranet site.
 - Mandatory pre-planning, including hazard assessment basics.
 - Employee's responsibility to report unsafe actions and conditions, and employee's authority to stop unsafe work.
 - Availability of task-specific training, refresher training, and related initiatives.

- Basic requirements of incident reporting, notifications, and investigation.
- Substance abuse prevention program, fit for duty requirements, and the availability of medical support.
- Office orientation including emergency procedures, location of emergency supplies, warning against entering restricted areas, and office-specific procedures.

2. PROJECT-SPECIFIC MANDATORY TRAINING REQUIREMENTS AND CERTIFICATIONS

The mandatory training and certifications that are applicable to this project, including requirements for periodic retraining and recertification, are listed in Table 4. Any additional project-specific training have been determined by the SSHO in consultation with the AECOM CTO manager, and are included in the AHAs (Appendix A). All required training will be documented, and all requisite documentation of training will be maintained on-site as well as electronically stored on the AECOM Honolulu office server. Individuals without proper training will not be permitted on-site. In addition to the project-specific training requirements, all site personnel will be familiar with the signs and symptoms of COVID-19 and follow all precautions mandated or recommended to protect against its spread (Section i.6).

Table 4: Project Training Requirements

Topic	Description	Personnel	Frequency
AHA	Review AHA controls and training requirements for a specific phase or activity.	All site workers, supervisors, and field oversight personnel engaged in the activity	Prior to commencement of activity
APP	Receive training on site-specific hazards and control requirements, including proper use and care of PPE.	All site workers, supervisors, field oversight personnel, and visitors	Daily, before commencement of field work
APP	Attend a refresher training on various safety issues, including any change in hazards, controls, or procedures.	All site workers, supervisors, field oversight personnel, and visitors	Daily, upon changes in conditions
COVID-19 Guidelines	Provide general information on COVID-19 awareness and practices for preventing the spread of COVID-19.	All site workers, supervisors, and field oversight personnel engaged in the activity during the pandemic	Prior to commencement of activity during the pandemic
Drill Rig Operation – General	Provide on-site orientation of the drill rig, including its operation, inspection, maintenance, and emergency cut-offs. Review location of all overhead electrical lines and underground hazards, any possible hazardous agents in soil, and equipment emergency shutdown switches.	Drilling crew	Prior to commencement of activity
Electrical Safety – General	Provide general education on working conditions that have the potential to expose the employee to electrical hazards. Identify and mitigate the exposures.	All site workers	Annually and at time of task activity
Emergency Action Plan	Cover the emergency roles and responsibilities, emergency conditions and awareness, reporting and notification, evacuation, and other emergency-related procedures.	All site workers	Weekly, before commencement of field work
Fatigue Management	General recognition and management techniques to prevent fatigue.	All site workers	Initially

Final APP Supplemental Remedial Investigation
 June 2021 *Keyport OU 2, Area 8, Naval Base Kitsap, Keyport, WA* *Page 21 of 61*

Topic	Description	Personnel	Frequency
Field Experience	Three days of field work experience (minimum) under the direction of a skilled supervisor.	All site workers	Initially
First aid or CPR	Provided by the Red Cross, National Safety Council, or other authorized course with current refresher.	At least 2 project personnel onsite at all times work is conducted	Annually or as issued by the provider
Hazard Communication Training	Review all chemical products used, their hazards, and the location of Safety Data Sheets in accordance with OSHA requirements.	All site workers	Annually and as new hazards are introduced on-site
HAZWOPER	40-hour initial HAZWOPER training established in 29 CFR 1910.120 (e)(2) and (e)(3).	All site workers	Once
HAZWOPER Refresher	8-hour HAZWOPER refresher training established in 29 CFR 1910.120 (e)(8).	All site workers	Annually
HAZWOPER Supervisor	Additional required 8 hours of training addressing supervisor responsibilities and obligations in maintaining an effective H&S program in accordance with 29 CFR 1910.120 (e)(4).	FM and SSHO	Once
Heat Stress	Provide general education on signs of heat stress, prevention, and immediate response to suspected cases of heat stress.	All site workers	Bi-annually and at time of task activity
Heavy Equipment	Training on proper operating procedures in accordance with the equipment manufacturer's operating manual.	Equipment Operator	Before commencement of field work
Manual Lifting – Ergonomics	Provide general education on proper lifting techniques, use of equipment, and identification of potential lifting hazards as they occur.	All site workers	Bi-annually and at time of task activity
Medical Surveillance	Participate in a medical surveillance program for those involved in HAZWOPER activities, as required by 29 CFR 1910.120(f).	All site workers	Annually
OSHA 30	30-hour OSHA construction course as required by EM 385-1-1, Section 1.A.17.b.	SSHO and FM	Once
PPE	Training on selection, use, and decontamination procedures required for the proper use of PPE.	All site workers	Annually and at time of task activity
Respirable Crystalline Silica	Identify existing and foreseeable respirable crystalline silica hazards and take prompt corrective measures to eliminate or minimize them.	All field workers conducting conventional monitoring well installation	At time of task activity
Slips, Trips, and Falls	Provide general education on housekeeping practices and methods of ensuring a clear work area is established and maintained; identify a clear pathway and any obstructions; maintain a visual path to ensure firm footing and avoid stepping over or on obstructions and materials.	All site workers	Bi-annually and at time of task activity

Note: The training required for Competent and Qualified Person(s) is discussed in Section d.4.

3. PERIODIC SAFETY AND HEALTH TRAINING FOR SUPERVISORS AND EMPLOYEES

All workers, including managers and supervisors, will receive training and instruction in both general and job-specific safety and health practices. Training for an employee, manager, or supervisor occurs under the following circumstances:

- Prior to an employee encountering hazards specific to their job assignment.
- A new substance, process, procedure, or equipment introduced to the workplace is recognized as a new hazard.
- Recognition of a new or previously unrecognized hazard.

- A new employee is hired.
- An existing employee is given a new job assignment for which training was not previously provided.

Training will be provided by a qualified and experienced trainer, online through vetted training resources, or through other methods as approved by the CTO manager or designee.

All required training will be documented, and this training documentation will be maintained on-site when practicable or at the main AECOM office in Seattle, Washington. For AECOM employees, online training records from AECOM University will also be retained.

4. EMERGENCY RESPONSE TRAINING REQUIREMENTS

Prior to performing any tasks for this project, all site personnel will go over emergency telephone numbers (Table 9), emergency evacuation procedures, the location of all site fire extinguishers and their proper use, the location of first-aid kits, and personnel certified in first aid and CPR. All AECOM employees and subcontractors working on-site will be briefed on emergency response actions as defined in Section i.2 of this APP.

g. Safety and Health Inspections

1. ASSIGNMENT OF RESPONSIBILITIES

Specific assignments of responsibilities for minimum general inspection requirements for this project are listed below in Table 5. Findings that represent deficiencies in the implementation of the APP or EM 385-1-1 and that cannot be corrected immediately will be documented and forwarded to the affected parties' offices. Updates will be provided on a daily basis as needed.

1a. Inspectors Identification

Table 5: General Inspections and Calibration Requirements

What	Who		When	Documentation
	Title	Name		
General Site Conditions	SSHO or Designated Representative	Josie Smith/ Nathan Gwyn	Daily	Field Logbook.
	AECOM CTO Manager or Designee	Greg Burgess	Monthly	IndustrySafe Management Site Visit.
Manual and Power Tools	Users	All site workers	Daily	Tag and remove defective items from service.
Sampling Equipment (e.g., split spoons, bladder pumps)	Users	All site workers	Daily	Tag and remove defective items from service.
Screening Equipment (e.g., PID, dust monitor, noise dosimeter, water quality meters)	Users	All site workers	Daily	Document calibration in logbook or on AECOM SH&E form S3AM-127-FM10, <i>Instrument Calibration Log</i> . Tag and remove defective items from service.
Heavy Equipment (e.g., drill rig, backhoe)	SSHO and Subcontractor Competent Person	Josie Smith/ Nathan Gwyn (AECOM), Dale Abernathy (Holt)	Daily	AECOM SH&E forms S3AM-309-FM2, <i>Heavy Equipment Pre-Operation Checklist</i> and S3AM-321-FM1, <i>Drilling, Boring, and Direct Push Equipment Inspection</i> .
PPE	User, SSHO, or Designee	All site workers	Initial and Daily Monitoring	Field Logbook.

Note: Inspectors' training and qualifications are located in Appendix C.

1b. Inspector Training and Qualifications

The SSHO's training and qualifications are located in Appendix C.

1c. Inspection Frequency

The SSHO or designee will be responsible for daily safety inspections of the project. These inspections may be conducted independently of each other or together as a joint effort. The SHM and AECOM CTO manager, or their designee, may make random inspections as warranted.

1d. Procedures for Documenting Results of Inspections

A management safety inspection form will be used to record, track, and follow-up on safety deficiencies to ensure that they are corrected after they have been identified. Sample inspection forms are provided in Appendix E. A record of the safety inspection will be maintained in the project file and uploaded to AECOM's corporate safety tracking system, IndustrySafe. The system allows for reporting deficiencies, recommending corrective actions, and follow-up.

1e. Deficiency Tracking System and Follow-Up Procedures

Deficiencies will be identified, posted, and dated when the deficiencies are corrected. Unserviceable tools and equipment will be taken out of service and repaired or replaced. Deficiencies are recorded in a deficiency tracking system, which provides a list of the deficiencies and monitors the status of a deficiency with respect to SOH, in accordance with EM 385-1-1, Section 01.A.13.d (USACE 2014).

2. EXTERNAL INSPECTIONS

External inspections are not typically expected for this or any similar project. However, federal, state, or local regulators may arrive at a site with or without prior notification to AECOM. Should a representative from any regulatory agency arrive on-site, the AECOM CTO manager, SSHO, and SHM will be notified immediately.

OSHA Visits

Should an OSHA inspection team visit the work site, AECOM will follow the procedures below:

- Check credentials of the OSHA team member(s).
- Notify the AECOM SHM.
- Notify the Navy CTO Contracting Officer's Representative of the OSHA visit.
- Provide an in-briefing and safety briefing to the OSHA team.
- OSHA personnel will be required to wear any appropriate PPE before visiting the work site.
- Be courteous during the visit and give OSHA personnel the necessary assistance.
- Notify the NAVFAC contracting officer's technical representative of any findings of non-compliance or non-conformance rendered by the OSHA team.

h. Mishap Reporting and Investigation

All work performed on the project will comply with the following requirements.

1. EXPOSURE DATA (MAN-HOURS WORKED)

Hours worked are managed on a task level and reviewed by the CTO manager weekly. Upon request, AECOM can provide project-specific man-hours worked as well as man-hours dedicated to field effort throughout the duration of the project.

2. MISHAP PROCEDURES

A mishap is any unplanned, undesired event that occurs during the course of work being performed. The term “mishap” includes accidents, incidents, and near misses. The following sections document AECOM’s procedures.

2a. Mishap Investigations, Reports, and Documentation

All mishaps occurring incidentally to an operation, project, or facility for which this APP is applicable shall be reported, investigated, and analyzed as prescribed below and in accordance with *Safety and Occupational Health USACE Accident Investigation and Reporting* (ER 385-1-99) (USACE 2010). Project personnel are responsible for reporting all mishaps immediately to their supervisor.

2b. Mishap Reporting Procedures

A *Contractor Significant Incident Report* (Appendix E) must be prepared by the CTO manager and submitted to the Navy RPM and contracting officer according to the following schedule:

Table 6: Mishap Reporting Schedule

Mishap Type	Reporting Procedure
Serious Contractor Mishap	
<ul style="list-style-type: none"> Fatal injury or illness Permanent totally disabling injury or illness Permanent partial disabling injury or illness One or more individuals hospitalized as inpatients as a result of a single occurrence \$500,000 or greater accidental property damage Three or more individuals become ill or have a medical condition which is suspected to be related to a site condition, or a hazardous or toxic agent on the site 	<ul style="list-style-type: none"> Immediately: AECOM CTO manager notifies Navy RPM. Within 4 Hours: AECOM CTO manager provides e-mail or written notification to the Navy SOH and the contracting officer, or the contracting officer’s representative. Within 24 Hours: AECOM CTO manager provides Preliminary CSIR to the Navy CTO COR, PM, and Contracting Officer. Within 5 Days: AECOM CTO manager provides Final CSIR to the Navy RPM and contracting officer.
<ul style="list-style-type: none"> One or more individual is fatally injured One or more individual is hospitalized as an inpatient as a result of a single occurrence 	<ul style="list-style-type: none"> Within 8 hours: AECOM CTO manager notifies OSHA in accordance with 29 CFR 1904.39.
<ul style="list-style-type: none"> Amputation Loss of an eye 	<ul style="list-style-type: none"> Within 24 hours: AECOM CTO manager notifies OSHA in accordance with 29 CFR 1904.39.
Non-serious Contractor Mishap	
<ul style="list-style-type: none"> OSHA-recordable injury or illness Property damage \$5,000–\$499,999 	<ul style="list-style-type: none"> Within 4 Hours: AECOM CTO manager will provide telephone or e-mail notification to the Navy RPM and contracting officer. Within 24 Hours: AECOM CTO manager provides Preliminary CSIR to the Navy RPM and contracting officer. Within 5 Days: AECOM CTO manager provides Final CSIR to the Navy RPM and contracting officer.
High Hazard Mishaps	
<ul style="list-style-type: none"> Electrical – to include Arc Flash, electrical shock, etc. Uncontrolled Release of Hazardous Energy (includes electrical and non-electrical) Load Handling Equipment or Rigging Fall-from-Height (any level other than same surface) Underwater Diving 	<ul style="list-style-type: none"> Immediately: AECOM CTO manager notifies Navy RPM.

Mishap Type	Reporting Procedure
Other Mishaps	
<ul style="list-style-type: none"> • Property damage < \$5,000 • Days Away Injuries and Illnesses • Restricted or Transfer Injuries 	<ul style="list-style-type: none"> • Within 24 hours after notification from the affected employee: AECOM CTO manager notifies Navy RPM.
<ul style="list-style-type: none"> • First aid injuries and illnesses 	<ul style="list-style-type: none"> • AECOM CTO manager will provide written reports to the Navy RPM and contracting officer upon request.

Note: High Hazard Near Miss involves electrical hazards (e.g., arc flash, electrical shock), uncontrolled release of hazardous energy (electrical or non-electrical), load-handling equipment or rigging hazards, falls from height, or underwater diving hazards.

COR Contracting Officer's Representative
 CSIR Contractor Significant Incident Report

2c. Mishap Corrective Actions

Following any mishap, corrective actions will be implemented as soon as possible. The investigation findings and a description of the corrective actions taken will be provided to the Navy RPM no later than five working days following the mishap.

AECOM Injury or illness and Accident/Incident Reporting Procedures

The following summarizes project- and company-specific reporting procedures that must be followed to comply with AECOM's response and reporting procedures in the event of any work-related injury, illness, incident, or near miss at an AECOM work location.

All accidents and incidents that occur on-site during any field activity will be promptly reported to the SSHO and the immediate supervisor in accordance with the following standards: EM 385-1-1 Section 01.D (USACE 2014), ER 385-1-99 (USACE 2010); 29 CFR 1904 *Recording And Reporting Occupational Injuries And Illnesses*, and AECOM SH&E SOP S3AM-004-PR1, *Incident Reporting, Notifications & Investigation* (Appendix E). If any AECOM employee is injured and requires medical treatment, the site supervisor will contact **AECOM's Incident Reporting Line at 800-348-5046, the SHM, and the AECOM CTO manager immediately**. The site supervisor or lead person on-site will initiate a written report using the *Report of Incident* form. Notification will be implemented after the site has been secured and medical treatment has been provided, and no later than the end of the work shift.

Each ill or injured site worker must notify his or her supervisor (as practicable) and SSHO immediately of the mishap, circumstances, the nature and extent of the injury or illness, and whether medical treatment is required. Except in cases where emergency medical aid is required (Section h), affected site workers will discuss their medical status with their supervisor and SSHO prior to obtaining medical treatment if possible.

The workplace supervisor must immediately perform the following procedures:

- In a life-threatening situation, use the emergency phone numbers provided in Section i and seek immediate medical care.
- Call the AECOM Incident Reporting Line at 800-348-5046 and follow the directions provided by the hotline.
- Report a mishap by the end of the current work shift.
- Notify the SSHO listed in the contact information (e.g., provided in the SSHP emergency response listing) if immediate assistance is required.

- Complete the applicable paperwork in accordance with OSHA forms 300, 300A, and 301; and AECOM SH&E SOP S3AM-004-PR1, *Incident Reporting* (Appendix E). Fax a draft copy to AECOM's Safety Department as soon as possible.
- Notify the program manager, and secure the director's signature on the applicable form within 48 hours.
- Initiate an incident investigation and review.

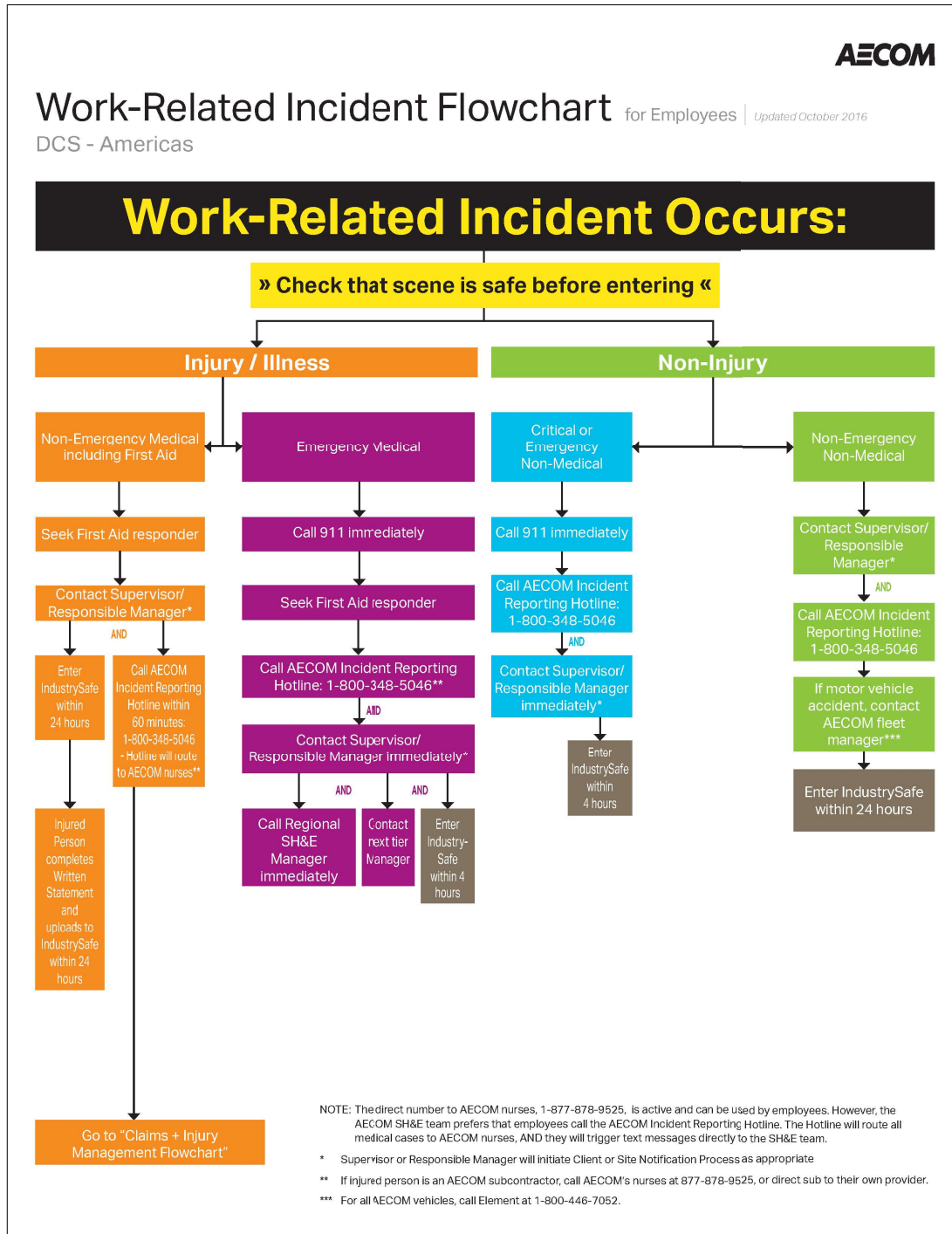
Fatalities must be reported to the AECOM CTO manager and SHM as soon as reasonably possible but **no more than 2 hours** after the incident.

The AECOM CTO manager will review the applicable documents and forms as prepared by the workplace supervisor and forward to the SHM within **24 hours**. All mishaps that occur on-site during field activities associated with this project will be promptly reported to the AECOM CTO manager and the SHM.

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 SHM within **24 hours** of the incident.

All accidents and incidents will be investigated in accordance with EM 385-1-1 Section 01.D (USACE 2014), ER 385-1-99 (USACE 2010); 29 CFR 1904 *Recording and Reporting Occupational Injuries and Illnesses*, and AECOM SH&E SOP S3AM-004-PR1, *Incident Reporting, Notifications & Investigation* (Appendix E). Copies of all subcontractor accident investigations, whether accomplished in accordance with their own procedures or AECOM's, will be provided to the SHM within 5 days of the accident or incident. Figure 4 provides a flow chart of AECOM's Incident Reporting process.

Figure 4: Incident Reporting Flowchart



i. Plans, Programs, and Procedures

Based on a risk assessment of contracted activities and on mandatory OSHA compliance programs, the following plans, programs, and procedures were developed for this project with the objective of:

- Providing project-wide safety procedures, hazard controls, and communication standards for all employees and subcontractors.
- Coordinating with all project personnel on such matters as:
 - Project-specific, project-wide emergency response and evacuation procedures
 - PPE requirements
 - Recordkeeping and reporting requirements
 - Training requirements

Review and Update

These procedures in this APP have been prepared prior to the start of any work activities on the job site and will be updated throughout the life of the project to reflect changing site conditions, construction methods, personnel roles and responsibilities, and construction schedules.

Acceptance

All changes to the APP shall be prepared or reviewed by AECOM's SSHO and then submitted to the AECOM CTO manager and SHM for review and approval. No activity shall be started on site until the APP has been submitted to the Navy for acceptance and approved. Any revisions will include site-specific plans, programs, and procedures required to complete the project, and will require subsequent Navy approval.

Any significant modifications must be incorporated into the written document as addenda, and the APP must then be reissued. AECOM will ensure that all personnel covered by this APP are informed of all issued addenda. Sign-off forms will accompany each addendum and must be signed by all personnel covered by the addendum. The APP addenda will be reviewed and discussed during the daily safety meeting. Attendance at meetings to review new information is required for all site workers and will be documented.

Specific Plans, Programs, and Procedures

The following plans, programs, and procedures have been assessed for applicability and developed to comply with the requirements detailed in the EM 385-1-1, federal and state regulations, and AECOM SH&E SOPs. If there is a discrepancy among regulatory requirements, the most stringent guidance is applied.

1. FATIGUE MANAGEMENT PLAN

This plan has been created in accordance with EM 385-1-1, Section 01.A.20 (USACE 2014) and AECOM SH&E SOP S3AM-009-PR1, *Fatigue Management* (Appendix E).

The purpose of the plan is to reduce employee fatigue through awareness, management, and treatment. The plan applies to AECOM and subcontractor personnel in the performance of work wherein fatigue may be a factor that impacts their fitness for duty.

Fatigue is mental or physical exhaustion that stops a person from being able to function normally. It is mainly caused by a lack of sleep, but may also be associated with prolonged periods of physical or

mental exertion without sufficient time to recover. Fatigue can be caused by work-related stresses, non-work-related stresses, or a combination of both. Work-related stress may be due to such factors as the pace of work schedule, location of work, environmental conditions of the work area (e.g., noise, lighting), and degree and duration of concentration required to perform a task. Non-work-related fatigue may be influenced by such factors as personal lifestyle, health issues, and family responsibilities. Long-distance travel can cause fatigue by disrupting a person's natural biological rhythms.

Per the EM 385-1-1, Section 01.A.20 (USACE 2014), a fatigue management plan is required if work hours:

- Exceed 10 hours a day for more than 4 consecutive days
- Exceed 50 hours in a 7-day work week
- Exceed 12 hours a day for more than 3 consecutive days
- Exceed 58 hours a week for sedentary (including office) work

Anticipated Work Activities and Limitations

Those affected by fatigue include both field and office workers. Some general controls for minimizing fatigue for certain work activities are provided below:

- Work scheduling (limit number of consecutive extended shifts)
- Rotating jobs to prevent repetitive work
- Taking breaks at critical times in the work cycle
- Control of environmental factors (heat, cold, PPE usage)
- Buddy check-in for individuals working alone
- Alternate transportation for long commutes

AECOM is committed to ensuring that workers do not compromise safe performance by undertaking work when impaired by fatigue or stress. AECOM recognizes that rest is critical to personnel safety and productivity.

For the purpose of this plan, rest is defined as the period of time when a worker is off duty, is not performing work (including administrative tasks), and is afforded the opportunity for uninterrupted sleep. Rest does not include breaks, meals, or travel time to and from work.

Equipment Operators: Operators of equipment (e.g., mobile construction equipment and hydraulically operated equipment) shall not be permitted to exceed 12-hours of work in any 24-hour period. A minimum of 8 consecutive hours of rest shall be provided in each 24-hour period.

Motor Vehicle Operators: While on duty, operators of motor vehicles shall not operate vehicles for a continuous period of more than 10 hours in any 24-hour period. No employee may operate a motor vehicle while on duty after being on duty for more than 12 hours during any 24-hour period. A minimum of 8 consecutive hours shall be provided for rest in each 24-hour period.

Sampling Activities: Sampling activities can exceed 50 hours per work week or 12 hours a day in excess of 3 consecutive days. Field personnel are to be given a minimum of two 20-minute or longer breaks during the work period.

Additional Activities (including office work): Due to project demands, work weeks may exceed 58 hours for office personnel. A minimum of 8 consecutive hours shall be provided for rest for every 24-hour period.

Driving (including to and from work): If an employee feels unable to drive due to fatigue, the employee is required to find a suitable location to rest and stop driving.

Management Responsibility

Implementation of this plan is the responsibility of the CTO manager. The CTO manager shall be responsible for the following:

- Identifying factors in the work place that may contribute to fatigue.
- Informing workers of potential fatigue-inducing activities and how to manage them.
- Re-evaluating work tasks periodically to control fatigue.
- Monitoring workers for signs and symptoms of fatigue.
- Providing workers with sufficient breaks for food, water, and rest throughout the workday.
- Issuing unscheduled breaks or meals as necessary when fatigue signs are evident.
- Consulting with workers on any fatigue-related issues when extended work periods or shift work is anticipated.
- Limiting extended workdays to a maximum of 14 hours, and extended work weeks to 60 hours. Where such an arrangement is not feasible, develop project-specific fatigue management guidelines for inclusion in site-specific SH&E plans.
- Reviewing and approving project-specific extended work schedules prior to implementation.

Workers are expected to carry out their tasks in a manner that does not put at risk the H&S of their person, their fellow employees, or any other person on the site (including contractors, clients, and the public). If any worker feels unable to perform work safely due to fatigue, the worker must stop work immediately and notify his or her supervisor. Workers are responsible for managing personal fatigue in the work place and to observe fatigue prevention practices such as the following:

- Report to work well-rested and mentally alert. Make choices that enable fitness for duty, including getting sufficient rest and sleep to recover from prior work duties, and managing personal, commuting, medical, and health issues.
- Seek medical advice for any personal conditions affecting sleep, such as apnea or insomnia.
- Notify your physician of any changes in your regular work schedule if you are taking daily prescriptions. Many medications exhibit important differences over the course of time, such that the effects of the medication may vary depending on the amount of time elapsed since the medication was administered.
- Take adequate rest and meal breaks for the working conditions.
- Consider seeking assistance from the Employee Assistance Program for self-management of fatigue or other issues that may have a bearing on fatigue at work.
- Inform managers or supervisors when you suspect a co-worker is fatigued or if you feel fatigued to a point that increases the risk of an incident or error.

Training and Treatment

If a worker suspects that a fellow worker (including a subcontractor or client) is suffering from fatigue, the worker must intervene on behalf of the affected person, stop work, and notify his or her supervisor.

All project personnel will be trained to recognize signs that may be associated with fatigue, which include the following:

- Physical Symptoms
 - Bloodshot eyes
 - Poor coordination
 - Slower movements
 - Slower-than-normal response time (e.g., response to commands or radio signals)
- Cognitive Function Symptoms
 - Distraction from task
 - Poor concentration or lapses in concentration
 - Inability to complete tasks
 - Short-term memory loss
 - Nodding off momentarily
 - Fixed gaze
 - Reports of blurred vision
- Emotional and Behavioral Symptoms
 - Appears depressed
 - Indifferent to work
 - Shows irritability and is easily frustrated with a task
 - Increased or noticeable level of unexplained or unusual absenteeism

Fatigue from physical exertion can be managed with proper food and rest. Workers should be rotated for tasks that require high physical exertion. However, fatigue related to emotional, financial, or other stressors cannot be so easily managed and can be debilitating. Whatever the case, people cope with stress differently and may exhibit different symptoms of stress fatigue. Workers who perform high-stress tasks should be monitored regularly for signs of fatigue and stress.

Workers are encouraged to take steps to address the underlying causes of fatigue such as:

- Getting adequate, undisturbed, regular, and consistent amounts of sleep each night. A minimum of 7 hours is recommended.
- Eating well-balanced and nutritious meals at regular intervals.
- Ensuring adequate consumption of water throughout the day.
- Exercising or stretching regularly.
- Maintaining a reasonable work and personal schedule.

- Avoiding alcohol, smoking, and drugs. Stimulants, including caffeine, may provide temporary relief from certain types of fatigue, but can increase the problem when the effect wears off.
- Taking a break from stressful circumstances by taking vacation or personal leave.

2. EMERGENCY RESPONSE PLAN

A site-specific emergency response plan that provides a systematic response to an on-site emergency will be created for this project in accordance with EM 385-1-1 Sections 01.E and 09.F (USACE 2014); 29 CFR 1910.38 *Emergency Action Plans*, 1910, Subpart K, *Medical and First Aid*; 1910.106 *Flammable Liquids*, 150 *Control of Hazardous Energy (Lockout/Tagout)*, 155 *Fire Protection: Scope, Application and Definitions Applicable to This Subpart*, 157 *Portable Fire Extinguishers*, Subpart Z, *Toxic and Hazardous Substances*, 29 CFR 1926.151(c) *Open Yard Storage*; and AECOM SH&E SOPs S3AM-010-PR1, *Emergency Response Planning* and S3AM-011-PR1, *Fire Protection* (Appendix E). The emergency response plan will be created during the first mobilization day when the site can be visually inspected. Safe places of refuge and escape routes will be identified by the SSHO during the first on-site day and incorporated into the plan, which will be maintained on-site. The daily safety tailgate meetings will involve going over the emergency response plan with the field team prior to the start of work. In addition, an emergency response simulation will be conducted at the very beginning of the field investigation to give the field team an opportunity to critique the simulation and identify lessons learned. In the event of an emergency, the AECOM Incident Reporting Flowchart (Figure 4) should be consulted for reporting procedures. Reporting procedures that meet CLEAN contract requirements are presented below.

Responsibilities

Site Safety and Health Officer

The SSHO is the primary contact and coordinator of all emergency activities and is responsible for the following:

- Assuming full control of all work activities as the designated EC.
- Designating the evacuation assembly areas.
- Evaluating the severity of the emergency (SSHO will confirm the procedure for summoning emergency responders prior to beginning work operations).
- Implementing the appropriate response action.
- Summoning appropriate emergency services (e.g., fire department, police, or ambulance).
- Notifying all site personnel, the SHM, and concerned Navy authorities of the emergency situation.

The FM will act as an alternate point of contact and coordinator for emergency action issues.

Other On-site Personnel

Field personnel are required to inform the SSHO of all emergency situations and to abide by their issued response actions. Special medical problems of field personnel, such as allergies to insects, plants, or prescription medication, will be reported to the SSHO.

Emergency Equipment

In accordance with 29 CFR 1910, Subpart K, *Medical and First Aid*, the following emergency equipment will be available at the work site and in proper working condition.

First-Aid Kit

A first-aid kit will be available that meets the following requirements:

- First-aid kits will be in weatherproof containers, meet all regulatory requirements, and be stationed at all locations where site personnel are working.
- Personnel permitted to use first-aid kits will possess a current first-aid card. A minimum of two trained first-aid and CPR providers who have also received bloodborne pathogens training will be present on-site at all times.

Fire Extinguisher

One or more fire extinguishers with a minimum rating of 1A:10B:C will be available on-site at all times. In addition, a fire extinguisher with a minimum rating of 2A:10B:C will be mounted on each piece of heavy equipment for use in emergencies. Site personnel will be trained to use the different types of fire extinguishers available at the site and will learn their location.

Eyewash Units

An eyewash unit will be available on-site at all times. The eyewash meets the latest requirements of American National Standards Institute Standard Z358.1-2014 (ANSI 2015) and is capable of supplying hands-free irrigation to both eyes for at least 15 minutes at a flow rate of at least 0.4 gallons per minute.

Response Actions – Safety Equipment Problems

The inadequacy or malfunction of H&S equipment can potentially lead to a medical emergency. Examples include the following:

- Leaks or tears in protective clothing
- Failure of respiratory protective devices (i.e., self-contained breathing apparatus or air-purifying respirators)
- Encountering contaminants for which prescribed protective equipment is not suitable

Hence, equipment problems must be corrected before proceeding with field activities. Affected personnel must exit the work area until the equipment problem is corrected.

Response Actions – Fire

Activities conducted at the site could accidentally trigger a fire. A fire extinguisher meeting the minimum requirements of EM 385-1-1, Section 09, paragraph 09.F.02 will be available on-site at all times (USACE 2014). In addition, all vehicles and heavy equipment will be equipped with an appropriately rated fire extinguisher. All field personnel will be briefed on fire prevention measures, fire extinguishment methods, and evacuation procedures and will become familiar with the following standards: EM 385-1-1 Section 09.F (USACE 2014); 29 CFR 1910.106 *Flammable Liquids*, 29 CFR 1926.151 *Fire Prevention*, 29 CFR 1910.155 *Fire Protection*, 29 CFR 1926.157 *Fixed Extinguishing Systems, Gaseous Agent*, Subpart Z *Toxic and Hazardous Substances*; and SH&E S3AM-011-PR1, *Fire Protection* (Appendix E). Site personnel are instructed to use a fire extinguisher to contain and extinguish small fires (area of 1 square foot). Larger fires will require assistance from emergency responding agencies, such as the local fire department.

Response Actions – Medical Non-Emergencies and Medical Emergencies

A medical non-emergency poses a threat to a person's health but can be managed on-site through designated and qualified personnel and resources, AECOM's corporate medical provider, or an

occupational clinic. If non-emergency medical care is needed or if the SSHO cannot adequately evaluate the injury or illness, then AECOM’s corporate medical provider can be enlisted for medical support. Medical non-emergencies include sprains, strains, minor cuts, bruises, and insect bites with no allergic or secondary reaction.

A medical emergency poses a significant threat to a person’s health and requires immediate attention, which typically involves calling Emergency Medical Services. Medical emergencies may be triggered by events such as chemical exposure, heat stress, and poisonous insect bites.

During a medical emergency, the response personnel will accompany the patient to the medical facility whenever possible to advise on decontamination procedures. Table 7 provides instructions for responding to the following types of medical emergencies.

Table 7: How to Respond to Medical Emergencies

Emergency	Response
Inhalation	<ol style="list-style-type: none"> 1. Call for medical assistance. 2. Workers wearing proper respiratory protective equipment will remove the victim from the contaminated atmosphere. 3. If the victim is not breathing, CPR and first-aid qualified personnel will administer mouth-to-mouth resuscitation or CPR immediately.
Eye Contact	<ol style="list-style-type: none"> 1. Do not rub eyes. 2. Hold eyes open and flood eyes with emergency eyewash solution so that all surfaces of the eyes are thoroughly washed. 3. Continue washing for 15 minutes and call for medical assistance.
Skin Exposure	<ol style="list-style-type: none"> 1. Wash skin with soap and water for a minimum of 15 minutes. All contaminated areas on the body including hair will be thoroughly decontaminated. 2. If clothing is contaminated, remove in such a way as to minimize further contact with the substance. 3. Seek medical assistance.
Heat Stress	<ol style="list-style-type: none"> 1. Immediately remove the victim from the work area to a shady or cool area with good air circulation (avoid drafts or sudden chilling). 2. Remove all protective outerwear. 3. If the victim is conscious, offer sips of water or electrolytes. 4. Seek medical assistance.

Response Actions – Chemical Release or Other Significant Incident

On-site personnel will implement the following procedure in response to any incident that results in an injury, causes damage to Navy or other property in excess of \$500, causes a stoppage in work of more than 2 hours, or requires response service from the Navy Public Works Center or other offsite agency.

Incident Response Actions

- In the event of an incident, the SSHO (or the FM as the alternate) will assume full control of all work activities and be designated as the EC.
- The EC will assess the incident consequences and will order an immediate evacuation of the site if an uncontrolled hazard risk to site personnel exists. A headcount will be conducted to account for all personnel following an emergency evacuation. The location of the evacuation exit from the site and a rally point will be determined in the field. The SSHO will identify the

evacuation route and rally point during the daily tailgate briefing or more frequently as conditions change.

- Once the risk of worker injury is controlled, priority will be given to identifying and treating injuries, under the direction of the EC. First-aid procedures will be implemented immediately for all victims; emergency medical assistance will be contacted (in accordance with APP procedures) if injuries warrant response by emergency medical technicians. Less severely injured personnel may be transported to the designated hospital, sent home, or released to resume work.
- Once the injured parties are attended to, the EC will turn towards an assessment of the site to determine whether outside support is required to implement control or corrective measures. If outside support is deemed unnecessary, the EC will direct worker recovery actions for resumption of normal activities. Once activities resume, the EC will contact the CTO manager and SHM and provide a complete report of the incident, injuries or damage if any, and the completed response actions. Any instructions issued by the CTO manager or SHM will be carried out by the EC. The CTO manager is responsible for notifying the Navy RPM and CLEAN program director of the incident in a timely manner. Follow-up notifications will be given as needed in accordance with the follow-up procedures described below.
- If outside support is needed to handle the incident, then the EC will contact the appropriate response agency in accordance with the APP. The response agency will be provided information on the site and location, the nature of the incident, an assessment of the conditions at the site, and the type of support required. During the initial contact with the response agency, it must be informed that the work site is under environmental investigation and may potentially expose responders to environmental contaminants. The Navy has an emergency notification procedure form, *Oil and Hazardous Substance Spill Response & Notification Procedures – Contractors* (Appendix E), which include the following response actions:
 - Call the Federal Fire Department for all emergency situations involving hazardous chemical releases.
 - If release of a hazardous substance is above the reportable quantity or is a petroleum substance that creates a sheen on the water, notify other agencies including: the Navy On-Scene Coordinator, the National Response Center, the State Emergency Response Commission, and the Local Emergency Planning Committee. The Oil and Hazardous Substance form will be used in support of the incident response actions listed above.
 - After notifying the response agency, the EC will immediately contact the CTO manager and SHM and provide a complete report of the incident, injuries or damage if any, and the status of any ongoing response actions. Instructions issued by the CTO manager or SHM will be carried out by the EC. The CTO manager is responsible for notifying the Navy RPM and the CLEAN program director of the incident that day, if possible, before close of business or at the start of the next business day. Follow-up notifications will be given as needed in accordance with follow-up procedures.
- If the response from the responding agency is immediate, then the EC will remain on-site to meet the response team. If there is a delay, the EC will coordinate response actions until the response team arrives.¹ The EC will provide a copy of the APP to the response team leader;

¹ If the response is not immediate, the EC will take steps to ensure that the site is under control and poses no health or safety risk to persons or property before the EC leaves the premises. If no such assurance can be given, then the EC or designated personnel will remain on-site to keep the situation under control as much as possible until the response team arrives.

brief the team on conditions at the site, known physical and chemical hazards, recommended safety procedures, and so on; and take questions from the response team.

- Following the briefing, the EC will relinquish operational control of the site to the response team. The EC will remain on-site throughout the time that the response team is working unless dismissed by the response team leader or relieved by an authorized AECOM representative (e.g., the CTO manager). The EC will *not* direct response team actions during this time. When the response team has completed its work, control of the site will return to the EC.
- Once response activities are completed, the EC will notify the CTO manager and SHM.

If, after the responding agencies have brought the situation under control, there is still a need for outside support, the Navy Public Works Center may be notified to assist in post-emergency cleanup or as required by the APP. Additional injury and incident follow-up procedures are provided in Section h, *Mishap Reporting and Investigation*.

Prevention of Alcohol and Drug Abuse

AECOM is committed to providing a safe and healthy workplace for all employees. Consistent with this commitment and in keeping with the federal Drug-Free Workplace Act of 1988, it is the policy of AECOM to maintain a drug-free workplace.

As stated in AECOM SH&E SOP S3AM-008-PR1, *Fitness for Duty* (Appendix E), AECOM policy prohibits employees from being under the influence of alcohol or drugs or improperly using medication in any way that could diminish, or raise concerns regarding, an employee's ability to perform at his or her best for or on behalf of AECOM. While on duty, employees will not use or be under the influence of alcohol, narcotics, intoxicants, or similar mind-altering substances. AECOM also follows the following OSHA regulations: 29 CFR 1910 Subparts H, I, and Z.

This policy also prohibits the sale, possession, manufacturing and distribution of illegal drugs and other controlled substances in the workplace or while on company business off premises. Compliance with this policy is considered a condition of employment.

Violations of this policy are considered to be gross and willful misconduct and will result in disciplinary action, up to and including termination. Any illegal substances discovered in the workplace will be turned over to the appropriate law enforcement agency and may result in criminal prosecution.

Contingency Plan for Severe Weather

The individual is ultimately responsible for his or her personal safety and has the right to take appropriate action when threatened by severe weather. While no place is absolutely safe from severe weather, some places are safer than others.

Things to avoid during severe weather:

- High places and open fields, isolated trees, rain or picnic shelters, communications towers, flagpoles, light poles, bleachers (metal or wood), metal fences, and water (e.g., lakes, streams, rivers).
- Use of the telephone; hand washing; any contact with conductive surfaces with exposure to the outside, such as metal door or window frames, electrical wiring, telephone wiring, cable television wiring, and plumbing if lightning is a factor. Generally, identify and seek shelter that is appropriate for the type of severe weather encountered. Proper shelter is always defined by a sound structure that offers protection from the elements. When available, pay attention to

weather warning devices such as National Oceanic and Atmospheric Administration weather radio and credible weather detection systems. However, do not let this information override good common sense.

Weather-related hazards directly correlate with the type of weather involved. Hot, dry weather may cause greater dust emissions, particularly during intrusive activities. Rain may increase slip or trip hazards, particularly for ground workers. Additionally, lightning strikes during electrical storms could also be a potential hazard. The following procedures will be implemented once thunder or lightning is observed:

- If thunder is heard, be on the alert for any visible lightning flashes. Observe the storm front and track the direction it is moving. Continue to observe the storm front until it passes or until the prevailing direction is determined to be away from the site.
- If lightning is observed, count the time between the first and second flash. When the next lightning flash is observed, do a second count from the time the second lightning was observed to when the thunder is heard. A count of 5 seconds equals a distance of 1 mile; a count of 30 seconds equals a distance of 6 miles.
- Using the second count, determine what appropriate action to take with 30 seconds as your reference:
 - If the second count is greater than 30 seconds (meaning the storm is more than 6 miles away), continually observe the storm front. If the front is moving away, work will continue.
 - If the count indicates that the front is moving towards the site, put workers on alert for potential evacuation.
 - If the second count is equal to or less than 30 seconds (meaning the storm is less than 6 miles away), issue the evacuation command for all workers to report to the vehicle.

Work can resume once the front has passed and thunder is not heard for 30 minutes.

3. SITE SANITATION AND HOUSEKEEPING PLAN

This plan has been created in accordance with EM 385-1-1 Section 02.B (USACE 2014); 29 CFR 1910.22 *General Requirements*, 1926.25 *Housekeeping*; and AECOM SH&E SOP S3AM-013-PR1 *Housekeeping* (Appendix E). The following requirements will be observed:

- *Housekeeping*: All work areas will be kept clean and dry to the extent practicable and the nature of the work allows. Personnel will make reasonable efforts to keep slip, trip, and fall hazards to a minimum. Materials and supplies will be organized and placed in locations for convenient access without obstructing immediate work areas. Excess debris and trash will be collected and stored in appropriate containers (e.g., plastic trash bags, garbage can) and properly disposed of in a timely manner.
- *Smoking, Eating and Drinking*: Smoking, eating, and drinking will not be permitted in controlled work areas. Site workers must wash hands and face immediately after leaving controlled work areas (and always prior to eating or drinking). Consumption of alcoholic beverages is prohibited at all AECOM sites.
- *Potable Water*: An adequate supply of potable water will be available for consumption and use in cleaning activities. Potable water containers will be properly identified to distinguish potable from non-potable water. Individual bottles of water will be provided on-site;

employees will be encouraged to bring their own water containers as well. Water bottles will not be shared among workers.

- *Non-Potable Water:* Non-potable water cannot be used for drinking or washing but may be used for non-hygiene-related activities. All containers of non-potable water will be marked with a label indicating:

**Non-Potable Water
 Not Intended for Drinking Water Consumption**

- *Toilets and Washing Facilities:* A portable toilet facility will be provided on the work site. The facility will be located within the site boundaries. Servicing and cleaning of the toilet facility will be performed weekly. Hand sanitizer and hand wipes will be provided at the work site as a substitute for running water to maintain healthful and sanitary conditions. Personnel will be required to clean hands and face prior to breaks and at the end of daily work activities.
- *Waste Disposal:* Wastes generated at the site may include general trash, sampling items, and used PPE. All wastes, including used PPE, will be collected in trash receptacles brought on-site for that purpose and will be removed by the responsible contractor for offsite disposal.
- *Vermin Control:* Control of vermin is not anticipated to be a concern at the site. If vermin are detected, an appropriate hazard analysis will be conducted to identify appropriate response measures.

4. MEDICAL SUPPORT PLAN

This plan has been created in accordance with EM 385-1-1 Sections 03.A.01 and 03.A.03 (USACE 2014); 29 CFR 1910 Subpart K *Medical and First Aid*; and AECOM SH&E SOP S3AM-012-PR1 *First Aid* (Appendix E).

The plan provides for on-site medical support during project execution by requiring two or more individuals who are certified in first aid and CPR to be in the field during all work. For this project, on-site personnel certified to give medical assistance are listed in Table 8.

Table 8: On-site Medical Support Personnel

Name	Company	First Aid or CPR Certification Expires
Nathan Gwyn	AECOM	February 2022
Josie Smith	AECOM	May 2023

In addition, the plan requires that Type III first-aid kits that meet the requirements of EM 385-1-1 (USACE 2014) be available on-site. The first-aid kits will contain items listed in Table 3-1 of EM 385-1-1 (USACE 2014). Kits will be checked prior to site work and at least weekly to ensure that kits are refilled.

Offsite Hospital and Emergency Route Map

Emergency medical support contact information is listed in Table 9. The ECs and key personnel sheet provides the contact numbers of the nearest medical center and AECOM safety personnel. For each site, a designated party will have on hand emergency contact information.

If an injury or illness requires more than first aid and is an emergency, the affected party will be taken to the following local hospital (Figure 5):

St. Michael Medical Center
 1800 Myhre Road
 Silverdale, WA
 360-744-8800

For non-emergency medical treatment, the affected party will be taken to the following occupational clinic (Figure 6):

The Doctors Clinic Occupational Medicine
 9621 Ridgetop Blvd NW
 Silverdale, WA
 360-782-3400

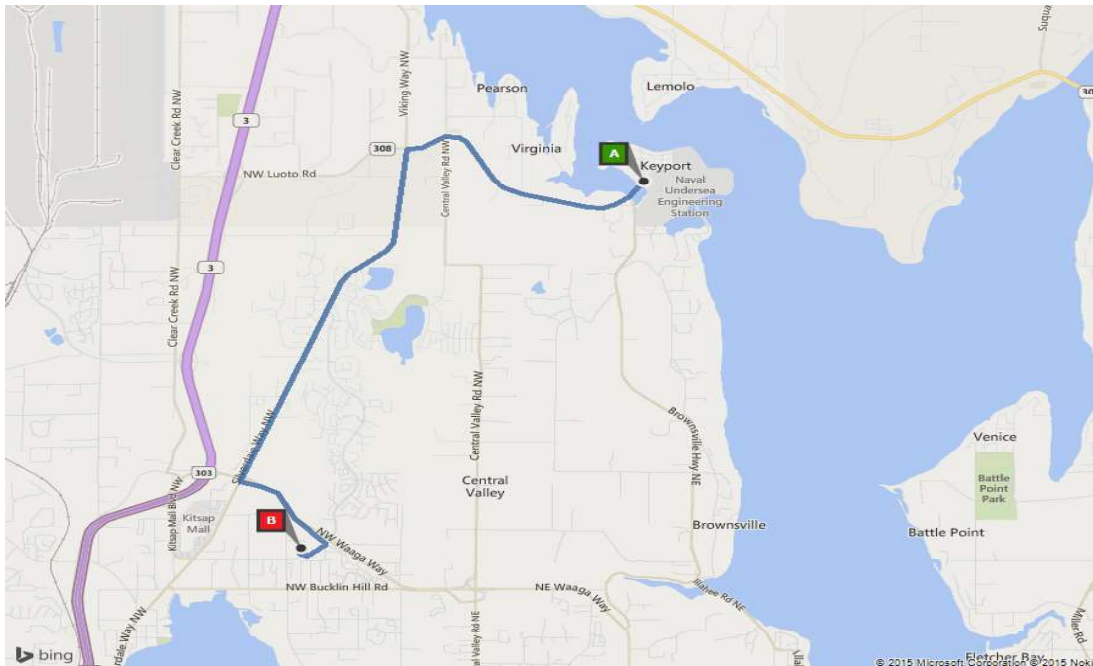
Table 9: Emergency Telephone Numbers

Emergency (Ambulance)	911
Fire Department:	
Police, fire department, or medical emergency	360-396-2244
Emergency Medical Care:	
St. Michael Medical Center 1800 Myhre Road Silverdale, WA 98383	Emergency Room: 360-744-8800 Main Hospital: 360-744-8800
Non-Emergency Medical Care:	
The Doctors Clinic – Ridgetop East 9621 Ridgetop Blvd NW, Silverdale, WA 98383	Clinic Number: 360-782-3400
Information and Response Organizations:	
National Response Center (if spill is over reportable quantity)	800-424-8802
Report a Spill Washington Emergency Management Division (Emergency Response)	800-258-5990
Local Poison Control Center	800-222-1222
Navy Personnel:	
RPM, NAVFAC Northwest, Carlotta Cellucci	360-396-2244
AECOM Personnel:	
CLEAN IV Safety and Health Manager, Devon Molitor	858-531-9666
CTO 0063 Manager, Greg Burgess	206-914-0533
SSHO, Josie Smith	808-356-5357
AECOM Incident Reporting Line:	
Washington State Department of Labor & Industries Safety & Health	360-902-5800

NW northwest
 PWC Public Works Center
 WA Washington

^a Contact SHM, CTO manager, or CLEAN program director for Emergency Service Agreement reference information.

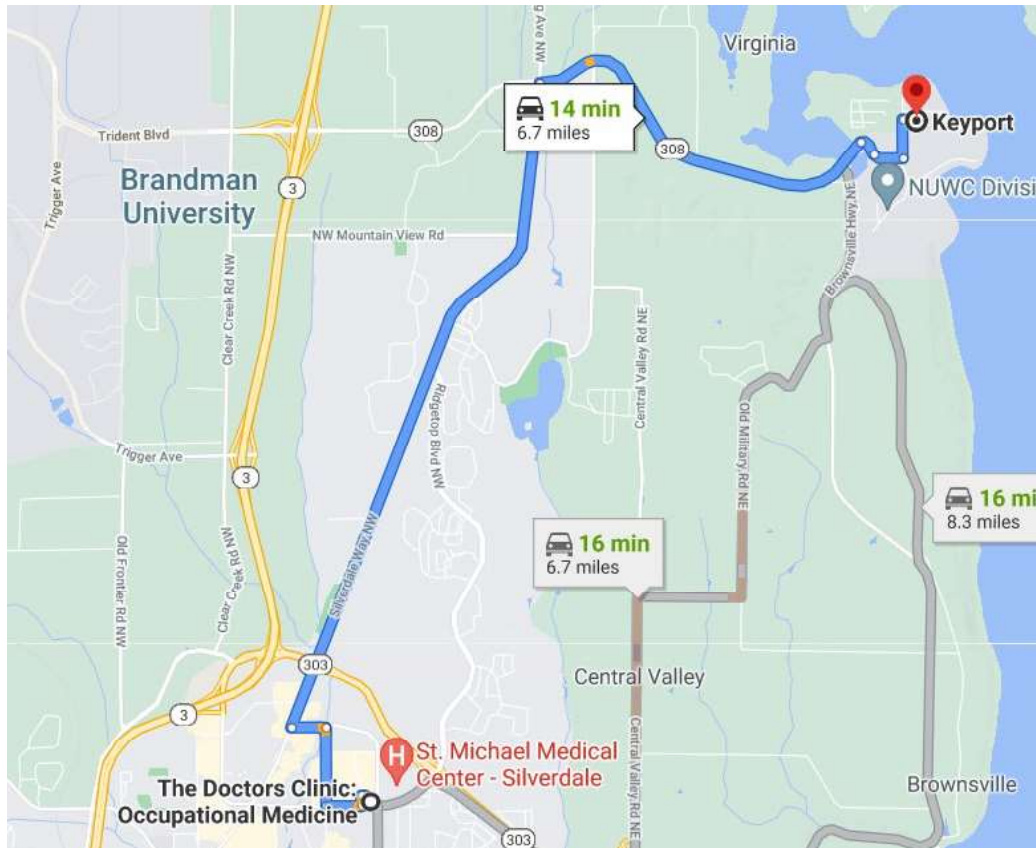
Figure 5: Hospital Route Map and Driving Directions



Route to St. Michael Medical Center, 1800 NW Myhre Rd, Silverdale, WA:

- Depart McKittrick Rd toward WA-308
- Take WA-308 (1.9 mi)
- Turn left onto Silverdale Way NW/Viking Way NW (3.1 mi)
- Take ramp left and follow signs for WA-303 South (0.6 mi)
- Take ramp right and follow signs for Ridgetop Blvd (0.2 mi)
- Turn right onto Ridgetop Blvd NW (0.2 mi)
- Turn right onto road (138 ft)
- Turn left onto road (446 ft)
- Arrive at 1800 NW Myhre Rd, Silverdale, WA on the right

Figure 6: Medical Clinic Route Map and Driving Directions



Route to The Doctors Clinic, 1800 NW Myhre Rd, Silverdale, WA:

- Depart McKittrick Rd toward WA-308
- Take WA-308 (1.9 mi)
- Turn left onto Silverdale Way NW/Viking Way NW (3.1 mi)
- Take ramp left and follow signs for WA-303 South (0.6 mi)
- Take ramp right and follow signs for Ridgetop Blvd (0.2 mi)
- Turn right onto Ridgetop Blvd NW (0.2 mi)
- Arrive at 9621 Ridgetop Blvd NW, Silverdale, WA on the right

5. BLOODBORNE PATHOGEN PROGRAM

Designated first aid and CPR responders will receive bloodborne pathogen training and instruction on using universal precautions when treating injured workers in accordance with EM 385-1-1 Section 03.A.05 (USACE 2014), 29 CFR 1910.1030 *Bloodborne Pathogens*, and AECOM SH&E SOP S3AM-111-PR1 *Bloodborne Pathogens* (Appendix E). PPE necessary to protect workers from bloodborne pathogens will be included in the on-site first-aid kits.

6. EXPOSURE CONTROL PLAN

This plan has been created in accordance with EM 385-1-1 Section 03.A.05 (USACE 2014), 29 CFR 1910.1030 *Bloodborne Pathogens*, and AECOM SH&E SOP S3AM-111-PR1 *Bloodborne Pathogens*, which includes the attachment S3AM-111-ATT1, *Bloodborne Pathogens Exposure Control Plan* (Appendix E).

Work performed for this project does not involve contact with biological or infectious waste. The only exposure scenario identified is the rendering of first aid or CPR due to an occupational injury or illness. The following exposure control plan outlines the protective measures designed to safeguard those workers designated as first aid or CPR responders.

Engineering and Administrative Controls

AECOM's incident reporting policy includes the immediate reporting of first aid injuries to notify the company of any scenario where an AECOM employee or subcontractor renders first aid or CPR care. This will allow for first aid responders to receive technical medical consultation from an AECOM Occupational Nurse or AECOM's corporate medical provider (Work Care).

Hepatitis B Vaccination

Any first aid rendered by a first aid or CPR responder is a collateral duty performed solely in response to any injury or illness that occurs at the work site during the course of work.

Hepatitis B vaccinations will be provided on request or as required for any first aid or CPR responder who rendered assistance in a situation that involved the presence of blood or other potentially infectious material (regardless of whether an actual exposure occurred). Appropriate post-exposure evaluation, prophylaxis, and follow-up medical support for the responder will be managed by AECOM's corporate medical provider or the equivalent for subcontractors.

Coronavirus Disease 2019 Exposure Controls

The following general measures, along with those in Appendix A, shall be implemented during the COVID-19 pandemic to help prevent the spread of the disease.

- To the extent practical, all individuals (including subcontractors) working at Department of Defense property, installations, and facilities will maintain six feet of social distance in public areas and work areas.
- Wash hands frequently using soap and water (preferable) or hand sanitizer with 60 percent alcohol for 20 seconds.
- If site conditions make social distancing impossible, wear face coverings consisting of cloth or other suitable material that cover the nose and mouth area while fitting snugly but comfortably against the side of the face. Avoid touching the mask while using it.
- Practice respiratory hygiene by covering the mouth and nose with the inside of a flexed elbow or tissue while coughing or sneezing.

- Avoid touching eyes, nose and mouth area with your hands to avoid transferring the virus from the touched surface to yourself.
- Wear disposable gloves and change the gloves between tasks.
- Avoid close contact with groups of people, spaces of limited ventilation, and unnecessary travel that may increase chances of exposure to COVID-19.
- Stay at home if you feel unwell; self-isolate if you believe that you may have been exposed to COVID-19.

PPE for First Aid

Latex, nitrile or other gloves that are suitable for protection against bloodborne pathogens will be included in first-aid kits at the site.

Training

Bloodborne pathogen training and the use of universal precautions will be addressed in first aid and CPR training.

During the COVID-19 pandemic, COVID-19 awareness training will be addressed during the daily safety briefings and include recognition of the signs and symptoms of infection and the precautions required on the job site to prevent the spread of the disease.

Recordkeeping

All medical scenarios including first aid must be reported in the AECOM Incident Report, documenting the nature of the injury or illness, the type of medical care provided, and the name of the provider. Medical records related to post-exposure evaluation and follow-up will be managed by AECOM's corporate medical provider or equivalent for subcontractors.

7. AUTOMATIC EXTERNAL DEFIBRILLATOR PROGRAM

An automatic external defibrillator device will not be used at the site.

8. SITE LAYOUT PLAN

A typical site layout plan created in accordance with EM 385-1-1 Section 04.A (USACE 2014) is provided in the SSHP (Appendix D).

9. TRAFFIC CONTROL PLAN

Precise locations of future groundwater monitoring wells requiring road closures have not yet been finalized. Prior to construction, access roads plans will be developed in accordance with EM 385-1-1, Section 04.B.01 (USACE 2014) and provided to the Navy for review and acceptance prior to the start of construction.

10. HEARING CONSERVATION PROGRAM

Created in accordance with EM 385-1-1 Section 05.C; 29 CFR 1910.95 *Occupational Noise Exposure*, 1926.52 *Occupational Noise Exposure*, 1926.101 *Hearing Protection*; and AECOM SH&E SOP S3AM-118-PR1 *Hearing Conservation* (Appendix E), the hearing conservation program was designed specifically for this project in accordance with jurisdictional requirements.

Appropriate hearing protectors will be used in the event that administrative or engineering controls are either not effective or not feasible. The selection of hearing protectors shall be based on actual or

anticipated exposure levels, the sound attenuation level provided by the device, and the manufacturer's product specifications on the use and limitations of the device. At a minimum, hearing protectors shall provide a level of protection that brings actual or anticipated exposure below the exposure limit. Additional information on the use of hearing protectors is as follows:

- The use of hearing protectors is required in any location where powered or motorized equipment, portable tools, or any other noise source is reasonably expected to exceed noise levels specified by the applicable jurisdiction or, in the absence of specifications, is based on an 8-hour time-weighted average (TWA) of 85 decibels in the A-weighting (dBA) (e.g., direct-push drill rig).
- Hearing protection is mandatory for all personnel when working in any area that has not been evaluated for noise exposure, when the ambient noise level in the area is such that a raised voice is necessary to have a normal conversation with someone less than 3 feet (1 meter) away, or when one is within 25 feet (7.6 meters) of an operating piece of heavy equipment.
- Hearing protection is mandatory for all personnel who work on or near heavy equipment, unless personal dosimetry or some other technique is used to show that actual exposure is within acceptable limits.
- Hearing protectors are available at no cost to any personnel who may be exposed to noise levels specified by the applicable jurisdiction or, in the absence of specifications, an 8-hour TWA of 85 dBA.
- Hearing protection is mandatory for any personnel who is exposed to 85 dBA for any period of time and who experiences a standard threshold shift.
- Whenever there is indication that exposure may equal or exceed specified noise levels (or an 8-hour TWA of 85 dBA, as applicable), the SSHO is responsible for enforcing the proper use of hearing protectors.
- At least two types of hearing protectors shall be available to personnel free of charge. The type of hearing protector worn shall be suitable to the task and approved for the applicable jurisdiction.
- Hearing protectors shall be used in accordance with manufacturer's specifications to effectively protect hearing. Refer to AECOM SH&E form S3NA-118-ATT1, *Hearing Protection Guidelines*.
- Evaluate the effectiveness of the hearing protectors selected for a particular task.

The manufacturer's assigned noise reduction rating (NRR) or attenuation for hearing protection devices can seldom be achieved in workplace conditions. Therefore, this rating shall be adjusted for real-world conditions and use as is explained herein: For devices with a NRR rating, subtract 7 from the NRR of the protector provided by the manufacturer. Divide this result by 2, and then subtract the remainder from the observed A-scale sound-level measurement collected in the work area. If this number is below 85, the hearing protectors are adequate for use in the work area.

11. RESPIRATORY PROTECTION PLAN

The need for respiratory protection for the performance of DFWs is not anticipated for this site. However, air quality will be monitored by using a PID to ensure safe conditions. If site conditions change as to warrant the use of a respirator, a respiratory protection plan will be developed in accordance with EM 385-1-1 Section 05.G (USACE 2014); 29 CFR 1910.134 *Respiratory Protection*; and AECOM SH&E SOP S3AM-123-PR1, *Respiratory Protection* (Appendix E).

12. HEALTH HAZARD CONTROL PROGRAM

This section is not applicable because exposure through inhalation, ingestion, skin absorption, or physical contact with any chemical, biological, or physical agent on-site is not expected to be in excess of the acceptable limits at this site.

13. HAZARD COMMUNICATION PROGRAM

A hazard communication program is provided in the SSHP (Appendix D) so that workers are informed of the hazards of the chemicals to which they may be exposed in the course of their work by way of container labeling and other forms of warning, safety data sheets, and training.

This program has been created in accordance with EM 385-1-1 Section 06.B.01; 29 CFR 1910.120 *Hazardous Waste Operations and Emergency Response*, 1910.1200 *Hazard Communication*, and AECOM SH&E SOP S3AM-115-PR1 *Hazardous Materials Communication* (Appendix E).

14. PROCESS SAFETY MANAGEMENT PROGRAM

This program is not applicable because no covered processes or covered chemicals are above the threshold.

15. LEAD COMPLIANCE PLAN

This section is not applicable because lead hazard control activities will not be performed.

16. ASBESTOS ABATEMENT PLAN

This section is not applicable because asbestos-containing materials are not known to be present at the site.

17. RADIATION SAFETY PROGRAM

This section is not applicable because no radioactive materials are present at the site or will be used in association with project work.

18. ABRASIVE BLASTING PROCEDURES

This section is not applicable because no abrasive blasting will be conducted.

19. HEAT STRESS MONITORING PLAN

This plan has been created in accordance with EM 385-1-1, Sections 06.J.02 and 33.E (USACE 2014); 29 CFR 1910 Subparts J *General Environmental Controls*, and K *Medical and First Aid*; and AECOM SH&E SOP S3AM-113-PR1, *Heat Stress* (Appendix E).

Heat stress can be a significant site hazard for field operations during the summer. Heat stress prevention will involve implementing a work–rest schedule and a physiological monitoring program. The results of the monitoring program will be used to adjust the work–rest schedule. Worker acclimatization and workloads will be assessed and work–rest schedules will be established in accordance with EM 385-1-1, Section 06.J.01 (USACE 2014). Given that temperature conditions are expected on average to reach 70 degrees Fahrenheit (°F) (21 degrees Celsius [°C]) or greater and that work that may involve donning semi-permeable encapsulating clothing, heat stress monitoring will be implemented during project work.

Additionally, site personnel will be instructed on heat stress prevention, identifying a heat stress victim, and first aid treatment for heat stress. To protect against heat stress, workers will comply with the requirements of the plan as described in the following sections.

Physiological Monitoring

Physiological monitoring will assess climatic, personnel, and working conditions that may contribute to heat stress. All site workers, irrespective of task or level of PPE (permeable, semi-permeable, or near-impermeable protective clothing) will be monitored for heat stress in accordance with EM 385-1-1, Section 06.J.02 (USACE 2014); 29 CFR 1910 J *General Environmental Controls*, and K *Medical and First Aid*; and as prescribed in SH&E procedure S3AM-113-PR1, *Heat Stress* (Appendix E). For this field effort, physiological monitoring involves monitoring the heart rate as described below.

Heart Rate Monitoring: At the start of the workday, each worker's baseline pulse rate, measured in beats per minute (bpm), is determined by taking a pulse count for 15 seconds and multiplying the result by 4. Against this baseline, the worker's pulse rate at the beginning and end of each break period can be measured and compared to determine whether the rest period allows the worker to adequately cool down according to the following criteria:

- Each worker's maximum pulse rate at the start of a break should be less than the difference of 180 and the worker's age in bpm. If the worker's pulse rate exceeds this value, then the duration of the next work period will be shortened by at least 10 minutes.
- At the beginning of each work period, a worker's pulse rate should return to within +10 percent of the worker's baseline pulse rate. If the pulse rate exceeds this value, then the break period will be extended to at least 5 minutes, after which the worker's pulse is taken again applying the same criteria as before.

Oral Temperature: In addition to heart rate monitoring, workers may also be monitored by taking their oral temperature. A clinical thermometer with a disposable probe cover (held for 3 minutes under the tongue) or a similar device will be used to measure the worker's oral temperature at the end of the work period and before drinking any liquid. The criteria for work-rest periods are applied as follows:

- If oral temperature exceeds 99.6°F (37.6°C), then the next work cycle is shortened by one-third with no change to the rest period.
- If oral temperature still exceeds 99.6°F (37.6°C) at the beginning of the next rest period, then the next work cycle is shortened by one-third.
- Whenever a worker's oral temperature exceeds 100.6°F (38.1°C), the worker is not permitted to don semi-permeable or impermeable clothing.

Work-Rest Schedule

A work-rest schedule based on anticipated work rate (where light work corresponds to minimal physical activity aside from standing and watching; very heavy work corresponds to significant, continuous physical labor) and the adjusted temperature (Table 10) will follow the work-rest schedule presented in Table 11.

The adjusted temperature method requires only that the ambient temperature (in °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 should be made by addition or subtraction to the ambient temperature reading, or changes

in table position, as indicated in Table 10. Adjustments are independent and cumulative; all applicable adjustments should be applied. The result is the Adjusted Temperature, which can be compared with the values for the applicable work rate (where light work corresponds to minimal physical activity aside from standing and watching, very heavy work corresponds to significant, continuous physical labor) to determine the work–rest frequency.

Table 10: Adjustment Factors to Calculate Adjusted Temperature

Factor	Adjustment
Time of Day	
Before daily temperature peak ^a	+2°F
10 a.m.–2 p.m. (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 if wearing CPC)	
Gusts greater than 5 mph at least once per minute	-1°F
Gusts greater than 10 mph at least once per minute	-2°F
Sustained greater than 5 mph	-3°F
Sustained greater than 10 mph	-5°F
Humidity (ignore if wearing CPC)	
Relative humidity greater than 90 percent	+5°F
Relative humidity greater than 80 percent	+2°F
Relative humidity less than 50 percent	-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
Level C (coveralls w/ hood, full-face respirator)	+10°F
Level B w/ airline	+9°F
Level B w/ self-contained breathing apparatus	+9°F and right one column ^b
Level A	+14°F and right one column ^b
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

CPC chemical protective clothing

mph mile per hour

^a This adjustment accounts for temperature rise during the day. If the temperature has already reached its daytime peak, it can be disregarded.

^b Locate the correct column for work rate in Table 11, move one column to the right (the next work rate level), and then locate the adjusted temperature.

Table 11: Work-Rest Schedule Based on Adjusted Temperature

Work–Rest Schedule	Adjusted Temperature (°F)			
	Light Work	Moderate Work	Heavy Work	Very Heavy Work
No specified requirements	<80	<75	<70	<65
15-minute break every 90 minutes of work	80–90	75–85	70–80	65–75
15-minute break every 60 minutes of work	>90–100	> 85–95	>80–85	>75–80

Work–Rest Schedule	Adjusted Temperature (°F)			
	Light Work	Moderate Work	Heavy Work	Very Heavy Work
15-minute break every 45 minutes of work	>100–110	>95–100	>85–90	>80–85
15-minute break every 30 minutes of work	>110–115	>100–105	>90–95	>85–90
15-minute break every 15 minutes of work	>115–120	>105–110	>95–100	>90–95
Stop Work	>120	>110	>100	>95

Notes: Time spent on decontamination or donning or doffing PPE should not be included in calculating work or break time-lengths.

Shaded cell indicates high-hazard conditions.

The SSHO or designee will determine the potential for heat stress based on planned activities, weather forecasts, and the field-calculated adjusted temperature. The SSHO will then determine the applicable work–rest schedule from Table 11 based on adjusted temperature and work intensity.

To use Table 11, determine the *Work Rate* at which the workers will be operating (where *Light Work* corresponds to minimal physical activity other than standing and watching, and *Very Heavy Work* corresponds to significant, continuous physical labor), then read down the column to the temperature range corresponding to the *Adjusted Temperature* (derived from Table 11). The *Work–Rest Schedule* for that row indicates the appropriate work schedule.

Shaded areas in Table 11 indicate high hazard conditions. When such conditions are anticipated during a workday, the SSHO will include a discussion of heat stress as part of the daily tailgate safety meeting topics.

Evaluating the Work-Rest Schedule

Once a work–rest schedule is established, the SSHO will continually evaluate its effectiveness through observation of workers for signs or symptoms of heart stress. Measurement of each worker’s pulse can provide additional information in determining whether the schedule is adequate, and instructions are detailed above in the heart rate monitoring section.

Heat Stress Monitoring and First Aid

Heat stress monitoring and first aid will be conducted in accordance with the following standards: EM 385-1-1, Sections 06.J.02 and 33.E (USACE 2014); 29 CFR 1910 Subparts J *General Environmental Controls*, and K *Medical and First Aid*; and AECOM SH&E SOP S3AM-113-PR1, *Heat Stress* (Appendix E). Workers are encouraged to promptly report any heat-related difficulties or issues that they experience or have observed in others. Supervisors should use the information to adjust the work-break schedule accordingly. During breaks, workers are encouraged to drink plenty of water or liquids to replace lost fluids and to help cool off.

If a worker exhibits signs of severe heat distress (e.g., profuse sweating, extreme confusion, irritability, or pale and clammy skin), then the worker shall immediately be relieved of all duties and shall rest in a cool location and drink plenty of water. Anyone experiencing or exhibiting symptoms of heat stroke (e.g., red dry skin or unconscious) shall be taken immediately to the nearest medical facility, with steps taken to cool the person down during transport (e.g., removing clothing, wetting the skin, and air conditioning). Heat stroke, which is a severe form of heat stress, is a life-threatening condition that must be treated by medical professionals.

Workers will be observed for heat stress during work activities. This section describes several potential heat-related illnesses, first aid procedures, and heat stress prevention guidelines. If workers exhibit signs of heat stress, then first aid will be provided and the work–rest schedule will be revised.

Heat-Related Illnesses: The following descriptions may be used to identify and treat heat-related illness:

- *Heat rash* is a skin irritation caused by excessive sweating during hot, humid weather. Heat rash develops when sweat ducts become blocked and perspiration is trapped under the skin. Symptoms range from superficial blisters to deep, red lumps. Some forms of heat rash can be intensely itchy or prickly.
 - *First Aid:* The best treatment for heat rash is to provide a cooler, less humid environment. Keep the affected area dry. Dusting powder may be used to increase comfort but avoid ointments or creams, which keep the skin warm and moist and may worsen the condition. Treating heat rash usually does not require medical attention although heat rash may be an early indicator that a worker is at risk for heat stroke or heat exhaustion. Heat rash usually heals on its own, but see a doctor if the symptoms last longer than three or more days, the rash seems to be getting worse, or there are signs of infection (e.g., increased pain; swelling; redness or warmth around the affected area; pus draining from the lesions; swollen lymph nodes in the armpit, neck, or groin; fever; or chills).
- *Heat Exhaustion* usually begins with muscular weakness and cramping, dizziness, staggering gait, and nausea. The victim exhibits pale, clammy skin and may perspire profusely. The pulse is weak and fast, bowels may move involuntarily, and the victim may faint unless made to lie down.
 - *First Aid:* Immediately remove the victim from the work area to a shady or cool area with good air circulation (avoid drafts or sudden chilling). Remove all protective outerwear. Treat the victim for shock (having the victim lie down and cooling the victim down by loosening all clothing). Elevate the person's legs above the head. If conscious, it may be helpful to give the person sips of water. Transport the victim to a medical facility as soon as possible.
- *Heat Stroke* is the most serious of heat illness, representing the collapse of the body's cooling mechanisms. As a result, body temperature may rise to 104°F or higher. As the victim progresses toward heat stroke, symptoms such as headache, dizziness, and nausea can be noted, and the skin is observed to be dry, red, and hot. Sudden collapse and loss of consciousness follows quickly, and death is imminent if exposure continues. Heat stroke can occur suddenly.
 - *First Aid:* Immediately evacuate the victim to a cool and shady area. Remove all protective outerwear and as much personal clothing as decency permits. Lay the victim on his or her back and elevate the legs above the head. Apply cold, wet towels or ice bags to the head, armpits, and thighs. Sponge off the bare skin with cool water or rubbing alcohol, if available. The main objective is to cool without chilling the victim. Give no stimulants or hot drinks. Since heat stroke is a severe medical condition requiring professional medical attention, emergency medical help should be summoned immediately to provide on-site treatment of the victim and proper transport to a medical facility.
 - Per the standards from EM 385-1-1, Sections 06.J.02 and 33.E, and AECOM SH&E SOP S3AM-128-PR1, Medical Screening & Surveillance (Appendix E), if an AECOM or subcontractor employee experiences a heat-related illness that required medical attention,

the employee will receive an exposure-specific examination by the company's occupational medicine physician prior to returning to work (USACE 2014).

Recommended Heat Stress Prevention Guidelines

The guidelines discussed in this section are intended to be used only as a means for initial establishment of a work-rest schedule.

- The SSHO in consultation with the SHM will evaluate the conditions for a specific operation and make final determinations of the work–rest schedule.
- Intake of fluid will be increased beyond that which satisfies thirst; avoid “fluid debt” as that cannot be made up as long as the individual is sweating.
- All workers will drink 16 ounces of water prior to beginning work, up to 32 ounces per hour during the work shift, and then at least 16 ounces during each rest period. 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 required and salt tablets should not be taken.
- Replacement fluids should be cool, but not cold.
- Breaks will be taken in a cool, shaded location, and any impermeable clothing should be removed.
- Dry clothing or towels will be available to minimize chills when taking breaks.
- Manual labor, other than paperwork or similar light tasks, will not be performed during breaks.
- Other controls that may be used include the following:
 - Scheduling work at night or during the cooler parts of the day (6 a.m.–10 a.m. and after 3 p.m.)
 - Erecting a cover or partition to shade the work area
 - Use of cooling garments (this option may be logistically difficult to implement)
- All site workers will be informed of the potential for heat stress during the daily safety meeting.
- The SSHO will determine whether any workers are at particular risk for heat stress due to illness or other health factors.
- The SSHO will ensure that sufficient quantities of potable water and electrolyte drinks are available in the decontamination area and that a shaded rest area is available at or immediately outside of the decontamination area.

Solar Protection

To protect against the extreme solar exposure at the project site and its surroundings, workers will observe the following requirements:

- Don tinted safety glasses at all times when working outdoors during daylight hours.
- Apply a commercial sun block with a minimum solar protection factor of 30 for ultraviolet A and ultraviolet B.

Rest Periods and Resting

Regular rest periods will be taken through the day and as required by the work-rest schedule detailed in the *Work-Rest Schedule* section above. The rest periods will be of sufficient duration to lower body temperature and pulse rate and to allow proper hydration. Field personnel will rest out of the sun, preferably sitting down, and with any impermeable or encumbering clothing and equipment opened or removed. The rest periods will be dedicated to monitoring personnel for signs or symptoms of heat stress and the intake of fluids. Manual labor other than paperwork or similar light tasks will be avoided during the rest periods.

20. COLD STRESS MONITORING PLAN

This section is not applicable because there is no:

- Extended work duration in refrigerated rooms.
- Work in cold environments or environments that could become cold due to wind speed.
- Extended bare-hand work in cold weather.
- Working with hands or parts of the body in cold water for periods greater than 10–12 minutes or potential cold water immersion.
- Working in snow or ice.

21. INDOOR AIR QUALITY MANAGEMENT

This section is not applicable because no field work will be conducted indoors.

22. MOLD REMEDIATION PLAN

This section is not applicable because mold remediation will not be conducted.

23. CHROMIUM (VI) EXPOSURE EVALUATION

This section is not applicable because there is no reason to suspect chromium exposure.

24. CRYSTALLINE SILICA EVALUATION

Personnel involved in the pouring of bentonite and installation of concrete well heads may be exposed to respirable crystalline silica. Whenever possible, wet methods will be employed to reduce personnel exposure. A crystalline silica assessment will be conducted for each operation where respirable crystalline silica exposure may occur utilizing AECOM SH&E SOPs S3AM-129-PR1, *Respirable Crystalline Silica* and S3AM-129-ATT1, *Silica Exposure Control – OSHA (Table 1)* (Appendix E). Personnel being exposed to silica will receive training on the hazards of respirable silica and be enrolled in a medical surveillance program.

25. LIGHTING PLAN FOR NIGHT OPERATIONS

This section is not applicable because outdoor work will be conducted during daylight hours.

26. TRAFFIC CONTROL PLAN

This section is not applicable because all work will occur outside of the flow of traffic.

27. FIRE PREVENTION PLAN

This plan has been created in accordance with EM 385, Section 09.A.01; 29 CFR 1910.39 *Fire Prevention Plans*, 1910.106 *Flammable Liquids*, 1910.147 *Control of Hazardous Energy (Lockout/Tagout)*, 1910.150 *Machinery, Equipment Maintenance; Final Rule*, 1910.155 *Fire Protection: Scope, Application and Definitions Applicable to this Subpart*, 1910.157 *Portable Fire Extinguishers*, 1910 Subpart Z: *Toxic and Hazardous Substances*, 1926.151 *Fire Prevention*; and AECOM SH&E SOP S3AM-011-PR1, *Fire Protection* (Appendix E).

The purpose of the fire prevention plan is to establish procedures for identifying fire hazards and preventing fires. All personnel are expected to follow the procedures outlined in this plan for their protection.

Fire Hazards

Personnel will be informed that smoking and lighters are prohibited in the work zone. If necessary, a cigarette butt receptacle will be utilized in a designated smoking area. No cigarette butts are to be discarded on the ground. No smoking is allowed except in an approved designated location with fire extinguisher(s).

Fire Prevention

Fire prevention is essential. Therefore, flammables, including paper waste, flammable liquids, and trash shall not be stored near a potential source of ignition. Additionally, sources of actual or potential heat shall not be placed or used near flammable materials.

Fire Control

A fire extinguisher with a minimum rating of 1A:10B:C will be available on-site at all times. Site personnel will be trained in the use of the available fire extinguisher type(s) and will be notified of the locations of all on-site extinguishers.

In addition, a fire extinguisher will be mounted on each piece of heavy equipment for use in an emergency. The minimum rating for each vehicle-mounted extinguisher will be 2A:10B.

If necessary, the Fire Department will be contacted for support. Procedures will be reviewed with all site personnel. Refer to Section i.2, for additional information.

28. WILD LAND FIRE MANAGEMENT PLAN

Wild land fire management is discussed in Section i.27.

29. ARC FLASH HAZARD ANALYSIS

This section is not applicable because personnel will not be working on or near exposed energized electrical equipment operating at 50 volts or more at the project site.

30. ASSURED EQUIPMENT GROUNDING CONTROL PROGRAM

All circuits supplying electricity to non-battery powered pieces of electrical equipment will be fitted with Ground Fault Circuit Interrupters. Therefore, an assured equipment grounding control program is not applicable or appropriate for this project.

31. HAZARDOUS ENERGY CONTROL PROGRAM & PROCEDURES

During work activities, the potential for exposure to electrical hazards exists. The primary hazards associated with electrical hazards are shock, burns, fire, and explosion. The procedure to reduce worker risk to electrical hazards is presented in S3AM-302-PR1, *Electrical Safety* (Appendix E). All equipment to be worked on will be de-energized before work is started. Lockout and Tagout procedures as described in S3AM-325-PR1, *Lockout Tagout* (Appendix E) will be used when working on any electrical equipment that has the potential to be energized.

32. STANDARD PRE-LIFT PLAN (LOAD HANDLING EQUIPMENT)

This section is not applicable because no load handling equipment will be utilized.

33. CRITICAL LIFT PLAN (LOAD HANDLING EQUIPMENT)

This section is not applicable because no critical lifts will be conducted.

34. NAVAL ARCHITECTURAL ANALYSIS – LOAD HANDLING EQUIPMENT (FLOATING)

This section is not applicable because no naval architecture work will be performed.

35. FLOATING PLANT INSPECTION AND CERTIFICATION

This section is not applicable because no floating plants will be utilized.

36. SEVERE WEATHER PLAN FOR MARINE ACTIVITIES

This section is not applicable because no marine activities will be conducted.

37. EMERGENCY PLAN FOR MARINE ACTIVITIES

This section is not applicable because no marine activities will be conducted.

38. MAN OVERBOARD AND ABANDON SHIP PROCEDURES

This section is not applicable because no marine activities will be conducted.

39. FLOAT PLAN FOR LAUNCHES, MOTORBOATS, AND SKIFFS

This section is not applicable because no marine activities will be conducted.

40. FALL PROTECTION AND PREVENTION PLAN

This section is not applicable because no personnel will be working at heights or exposed to fall hazards.

41. DEMOLITION/RENOVATION PLAN

This section is not applicable because no structures will be demolished or renovated.

42. ROPE ACCESS WORK PLAN

This section is not applicable because no rope access work will be performed.

43. EXCAVATION AND TRENCHING PLAN

This section is not applicable because no excavation or trenching will be performed.

44. FIRE PREVENTION AND PROTECTION PLAN FOR UNDERGROUND CONSTRUCTION

This section is not applicable because no underground construction will be performed.

45. COMPRESSED AIR WORK PLAN FOR UNDERGROUND CONSTRUCTION

Although work will not be performed in compressed air environments, personnel will be working with compressed air. This plan provides the requirements for using, handling, storing, transporting, disposition and decommissioning compressed gas cylinders in accordance with EM 385-1-1 Section 26.I (USACE 2014), 29 CFR 1910.101 *Compressed Gasses (General Requirements)*, and AECOM SH&E SOP S3AM-114-PR, *Compressed Gases* (Appendix E). The following compressed gas will be brought on site: isobutylene and nitrogen. The isobutylene will be used as a calibration gas for the PID and a nitrogen tank will be used for low-flow purging and groundwater sampling.

Responsibilities

AECOM CTO Manager

- Confirm that staff has received the appropriate training for compressed gases and compressed gas cylinders.
- Confirm that a hazard assessment and evaluation of the activities involving compressed gases has been completed.
- Contact the SH&E Department prior to any compressed gas cylinder operations.

AECOM SHM

- Review and authorize all compressed gas cylinder operation.
- Conduct and support compressed gas hazard assessments and evaluations.
- Provide awareness training to project teams on the hazards of the compressed gases that will be encountered.
- Support the identification and disposition of unknown compressed gas cylinder.
- Support the development of a site-specific cylinder plan.

Field Manager and SSHO

- Implement these procedures during all activities involving compressed gases.
- Consult with the SH&E Department when unknown compressed gas cylinders are encountered.
- Immediately report to the SH&E Department any leaking or suspected leaking compressed gas cylinders and implement the appropriate emergency actions.
- Immediately report the discovery of any unknown compressed gas cylinders to the SH&E Department and cordon off the area in all directions at a minimum radius of 50 feet.
- Confirm that all compressed gas cylinders are properly inspected, stored, and secured.

- Confirm that all compressed gas cylinders are handled in a safe manner to keep cylinders intact and to safeguard personnel.
- Confirm that all compressed gas cylinder manifolds and connections are properly fabricated and have been quality inspected.
- Contact local emergency services prior to the start of any compressed gas cylinder operation.

Employee

- Immediately report any leaking or suspected leaking of compressed gas cylinders to your immediate supervisor.
- Immediately report the discovery of any unknown compressed gas cylinders to your immediate supervisor.
- Properly handle all compressed gas cylinders.
- Staff shall be supervised by personnel experienced in the operation of compressed gas tools and equipment.

Compressed Gas Cylinder Requirements

- Cylinders are not to be used unless they bear DOT markings, indicating that they have been tested as required by DOT regulations.
- Cylinders shall never be dropped, struck, or permitted to strike each other violently. Cylinders may be moved by tilting and rolling them on their bottom edges.
- Valve protection caps shall always be kept on cylinders when they are being moved or stored, and shall not be removed until ready for use.
- Do not lift cylinders by the valve protection cap.
- Cylinder valves are to be kept closed except when supplying gas or when connected to a permanent manifold. Valves of empty cylinders shall be closed.
- Cylinders shall never be used as rollers or supports, or for any purpose other than carrying gas.
- Threads on regulator connections or other auxiliary equipment shall be the same as those on the cylinder valve outlet.
- When withdrawing contents from the cylinder, open the cylinder valve slowly. Point the valve opening away from yourself and other persons.
- Before removing the regulator from a cylinder, close the cylinder valve and release all pressure from the regulator. This procedure also serves as a check to confirm that the main cylinder valve is completely closed.
- Never hammer the valve wheel in attempting to open or close the valve.
- No person, other than the gas cylinder supplier, shall refill a cylinder. Exceptions to this rule include filling self-contained breathing apparatus cylinders with compressed air or filling the (Foxboro) Organic Vapor Analyzer hydrogen cylinders. Disposable cylinders shall not be reused.
- Compressed gas cylinders shall be stored in areas safely away from external heat sources such as flame impingement, intense radiant heat, electric arc, and high-temperature steam lines.
- Cylinders are to be stored in an assigned area, with full and empty cylinders stored separately. Empty cylinders shall be marked empty.

- Cylinders are to be securely anchored to a fixed object using a chain or equivalent fastening device whenever they are placed in an upright position. The protective cap is not to be removed or the cylinder valve opened until the cylinder is secured.
- Repair of leaks shall never be attempted on a pressurized system. System pressure should be reduced to atmospheric pressure as rapidly as possible, and the supervisor notified immediately.
- Compressed gas cylinders shall be legibly marked for the purpose of identifying the gas content with either the chemical or the trade name of the gas. Such marking is to be done by means of stenciling, stamping, or labeling, and shall not be readily removable. Whenever practical, the marking is to be located on the shoulder of the cylinder. Positive identification of the gas in any cylinder is required before connecting cylinders for use.
- Gas cylinders moved by hoist shall be handled in suitable cradles or job-made “skip” (materials) boxes. Any slings used for this purpose shall be specifically designed for cylinder handling.
- Cylinders shall not be placed where they might form part of an electrical circuit.
- Transfer of compressed gases (including acetylene) from one cylinder to another, or mixing of gases in a cylinder, is prohibited.
- Use of a cylinder's contents for purposes other than those intended by the supplier is prohibited.
- Cylinders of compressed natural gas or propane equipped with a pressure relief device shall always be positioned in a manner that places the device above the liquid level. For instance, if the cylinder is stored, installed, or transported horizontally, the relief device should be located at the top relative to the horizontal orientation of the cylinder.

Inspection of Compressed Gas Cylinders

Prior to formally accepting any delivered compressed gas cylinders, a visual inspection of each cylinder will be documented as specified below. In addition, all compressed gas cylinders stored at an AECOM facility will be routinely inspected.

- Visually inspect the cylinder (see S3AM-114-FM1, *Compressed Gas Cylinder Inspection* [Appendix E]).
- Verify that all of the required markings are on the cylinder.
- If required, determine when the cylinder was last hydrostatically tested.
- Inspect the safety relief devices, if required.
- If any defects are noted during the inspection, the cylinder should be refused on delivery and a new delivery requested (notify AECOM Procurement agent or Purchasing Department).

Where compressed gas cylinders are stored at an AECOM facility, a qualified person will be designated to confirm that cylinder handling activities comply with the requirements in this procedure. Inspection entails the evaluation of the integrity of the cylinder as well as the serviceability of any attached manifold and valve fittings. Remote cylinder inspection is recommended for worker and public safety. The inspection of any cylinder will be conducted by a qualified person. See S3AM-114-FM1, *Compressed Gas Cylinder Inspection* (Appendix E).

Cylinder Inspection Procedures

All cylinder inspection procedures will adhere to the procedures identified in EM 385-1-1 Section 20.D (USACE 2014), 29 CFR 1910.101, and SH&E SOP S3AM-114-PR1, *Compressed Gases* (Appendix E). At a minimum, the inspection process will include the following procedures:

- Observe the cylinder from a safe distance to identify any visual markings or other information. Inspect the cylinder size, shape, and general condition. If visible, include the valve system or stem in the inspection process.
- If the cylinder or valve system appears to be in poor condition or lacks structural integrity, do not approach the cylinder. Signs that a cylinder may be in poor condition include the following:
 - Leaking
 - Hissing sound
 - Odor emitting from the cylinder
 - Rusty components
 - Bulging side wall or end
 - Corroded valve system
- If the cylinder is determined to be in poor condition, cordon the area off and limit access to authorized personnel only.
- Wear applicable PPE and approach the cylinder with the appropriate direct reading air monitoring instrument. Do not approach from either ends of the cylinder. Measure the airborne contaminant concentrations in the immediate area. Document cylinder information (e.g., visible markings, labels, placards).

Cylinder Color Coding Determination

The color coding of compressed gas cylinders is governed by the Compressed Gas Association, which assigns specific colors to categories or classes of chemicals and substances.

While recently manufactured cylinders reflect the color coding guidance established by the Compressed Gas Association, older cylinders may not follow this color coding convention. It is also possible that cylinders were repainted with a different color from the original. Hence, determining the contents of a cylinder should NEVER be based on the color of the cylinder alone.

Table 12 provides general guidelines of the standard color code for cylinders for each type of material that is stored.

Table 12: Color Standardization for Cylinders

Standard Color (Color of cylinder)	Class of Materials
Yellow	<i>Flammable Materials:</i> All materials known ordinarily as flammables or combustibles.
Brown	<i>Toxic and Poisonous Materials:</i> All materials extremely hazardous to life or health under normal conditions, such as toxics or poisons.
Blue	<i>Anesthetics and Harmful Materials:</i> All materials productive of anesthetic vapors and all liquid chemicals and compounds hazardous to life and property but not normally productive of dangerous quantities of fumes or vapors.
Green	<i>Oxidizing Materials:</i> All materials, which readily furnish oxygen for combustion and fire producers that react explosively or with the evolution of heat in contact with many other materials.
Gray	<i>Physically Dangerous Materials:</i> All materials, not dangerous in themselves, but causes asphyxiation when handled in a confined space or at a dangerous pressure or temperature level.
Red	<i>Fire Protection Materials:</i> All materials provided in piping systems or in compressed gas cylinders exclusively for use in fire protection.

Cylinder Staging

- Staging involves the organization, and occasional consolidation, of cylinders that have similar contents or characteristics.
- The staging of cylinders will occur in a remote location at the site to minimize the potential injury or property damage from an accidental release or emergency decompression. If the integrity of the cylinder is in question, it should not be moved.
- Safe distances will be based on the evacuation distances provided in DOT's *Emergency Response Guidebook* (most current edition).
- When multiple cylinders containing different substances are present, the distance should be based on the greatest evacuation distance required of whichever substances are present.

Cylinder Disposition Operations

Disposition refers to the recycling, treatment, or disposal of a compressed gas cylinder or its contents. Recovery and recycling of materials are preferred over any other method of disposition. Cylinder disposition activities shall be conducted by the cylinder vendor.

Personal Protective Equipment

If necessary, the inspection of cylinders containing unknown substances will be performed in a Level A (PPE) ensemble as a minimum, while cylinders containing known substances, and in good condition, will be inspected in an appropriate ensemble designated within the SSHP.

Where the use of a Level A or B ensemble is anticipated, the SH&E Department will be contacted during the pre-task planning to determine the appropriate level ensemble components, as well as the personnel involved who will be involved in the activity. The PPE ensembles must be approved by the SHM.

PPE includes, but is not limited to, the following:

- Eye and face protection
- Steel toed work boots
- Hearing protection

- Gloves
- Respiratory equipment, as required

Training

On-site orientation to the use and hazards of the equipment shall be completed for all staff handling or coming into contact with compressed air tools and equipment or compressed gas cylinders.

46. ERECTION AND REMOVAL PLAN FOR FORMWORK AND SHORING

This section is not applicable because no formwork or shoring will be performed.

47. PRECAST CONCRETE PLAN

This section is not applicable because no precast concrete operations will be conducted.

48. LIFT-SLAB PLANS

This section is not applicable because lift-slab operations will not be conducted.

49. MASONRY BRACING PLAN

This section is not applicable because no structural masonry will be erected.

50. STEEL ERECTION PLAN

This section is not applicable because no structural steel will be erected.

51. EXPLOSIVES SAFETY SITE PLAN

This section is not applicable because no explosives placement or explosives-related operations will be conducted.

52. BLASTING PLAN

This section is not applicable because no explosives placement or explosives-related operations will be conducted.

53. DIVE OPERATIONS PLAN

This section is not applicable because no underwater dive operations will be conducted.

54. SAFE PRACTICES MANUAL FOR DIVING ACTIVITIES

This section is not applicable because no underwater dive operations will be conducted.

55. EMERGENCY MANAGEMENT PLAN FOR DIVING

This section is not applicable because no underwater dive operations will be conducted.

56. TREE FELLING AND MAINTENANCE PROGRAM

This section is not applicable because no tree felling or maintenance of trees will be conducted.

57. AIRCRAFT AND AIRFIELD CONSTRUCTION SAFETY & PHASING PLAN

This section is not applicable because no work upon or around an airfield will be conducted.

58. AIRCRAFT AND AIRFIELD SAFETY PLAN COMPLIANCE DOCUMENT

This section is not applicable because no work upon or around an airfield will be conducted.

59. SITE SAFETY AND HEALTH PLAN FOR HAZARDOUS, TOXIC, AND RADIOACTIVE WASTE

A SSHP for this project is provided in Appendix D.

60. CONFINED SPACE ENTRY PROCEDURES

This section is not applicable because no activity will be conducted within a confined space.

61. CONFINED SPACE PROGRAM

This section is not applicable because no activity will be conducted within a confined space.

j. Risk Management Processes and Activity Hazard Analysis

Detailed project-specific hazards and controls will be provided by AHAs for each DFW. No work will begin on an activity until the initial AHA has been accepted by the Government Designated Authority addressing the project-specific hazards. AHAs for each DFW are provided in Appendix A.

A discussion of AECOM's risk management process is provided below.

Risk Management Process

AECOM risk management process is intended to ensure that all the project risks have been identified by the management team and safety professionals. By conducting an analysis of each step in the project execution, the team ensures that procedures and control measures are in place to control the exposure to risks.

Develop Controls and Make Risk Decisions

Hazards that cannot be eliminated by project design during hazard identification or the hazard assessment process are considered residual hazards. If the hazard cannot be eliminated through a design change, engineering or administrative controls may be used to reduce risk. An acceptable risk level may be achieved by installing safety and warning devices, instituting special procedures and training, and requiring donning special PPE. The decision to accept the risk of a residual hazard must be at a risk level appropriate to the priority of the residual hazard. From a safety standpoint, the goal is to achieve the lowest level of risk.

Hazard Control

The AHAs developed for each specific task defines the manner in which each hazard will be controlled to an acceptable level. The hierarchy of controls (engineering, administrative, and PPE as a last resort) has been utilized in identifying and employing control systems.

Implement Controls

One of the critical steps in the hazard management process is implementation of the risk decision made on the residual hazards. As a part of the Quality Control processes established on the project site, controls measures put in place will be evaluated for their effectiveness in protecting against hazards at a determined severity, probability, and risk level. Any deficiencies will be noted and changes to the associated AHAs implemented.

Supervise and Evaluate

The final step in the risk management process is supervising and evaluating the implementation of the risk decision made on the residual hazards. It is during this process that the effectiveness of the risk decision is ensured and that standards are being maintained at the highest level possible. In this step, the system safety program is evaluated and the mishap risk management process is audited that is required to maintain the high safety standard of the system.

k. References

American National Standards Institute (ANSI). 2015. *Standard for Emergency Eyewash and Shower Equipment*. Z358.1-2014. Approved January 8.

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United States Army Corps of Engineers (USACE). 2010. *Safety and Occupational Health USACE Accident Investigation and Reporting*. ER 385-1-99. Washington, DC: Department of the Army. March.

———. 2014. *Safety and Health Requirements Manual*. EM 385-1-1. Washington, DC: Department of the Army. November 30.

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Appendix A: Activity Hazard Analyses

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Risk Assessment Code Methodology

The risk assessment code (RAC) methodology is defined by a matrix that represents the degree of risk associated with a hazard, taking into account hazard severity and mishap probability. The RAC is derived as follows:

1. **Hazard Severity:** An assessment of the worst potential consequence, defined by degree of occupational injury, illness, or property damage that is likely to occur as a result of the deficiency. Hazard severity categories will be assigned according to the following criteria:
 - a. Catastrophic: may cause death, permanent total disability, or loss of a facility/asset.
 - b. Critical: may cause permanent partial disability, temporary total disability in excess of 90 days (severe injury or severe occupational illness), or major property damage.
 - c. Marginal: may cause minor injury, occupational illness, or property damage.
 - d. Negligible: presents minimal threat to personnel safety or health or property but is still in violation of a standard.
2. **Mishap Probability:** The probability that a hazard will result in a mishap or loss, based on an assessment of such factors as location, exposure (cycles or hours of operation), affected populations, experience, or previously established statistical information. Mishap probability will be assigned a category according to the following criteria:
 - a. Frequent: occurs very often, known to happen regularly.
 - b. Likely: occurs several times, a common occurrence.
 - c. Occasional: occurs sporadically but is not uncommon.
 - d. Seldom: remotely possible; could occur at some time.
 - e. Unlikely: not likely to occur but not impossible.
3. **RAC:** In the following matrix, the RAC is expressed as an alphabetic character that is used to help determine priorities for hazard abatement. The RAC (probability/severity) represented by E, H, M, or L for each “hazard” will be identified in the AHA. The overall highest RAC will be annotated at the top of the AHA.

Hazard Severity	Mishap Probability				
	Frequent	Likely	Occasional	Seldom	Unlikely
Catastrophic	E	E	H	H	M
Critical	E	H	H	M	L
Marginal	H	M	M	L	L
Negligible	M	L	L	L	L

RAC definitions: E = extremely high risk; H = high risk; M = moderate risk; L = low risk.

Table A-1: Activity Hazard Analysis for Site Preparation and Mobilization

Project/Location: Keyport, Washington		Job Task: Mobilization and demobilization	
	Prepared by: Demetrio Cabanillas,	Reviewed by:	
Date: 6/3/21	Competent Person (CP): AECOM-Josie Smith, Nathan Gwyn		
JOB STEPS	HAZARDS	CONTROLS	RAC
Mobilization and demobilization	Traffic Hazards	<ul style="list-style-type: none"> • Watch for Pedestrians. • Consider traffic conditions; modify speed and distance accordingly. • Unless specifically authorized all vehicles will remain on established roads. 	M
	Weather Hazards	<ul style="list-style-type: none"> • Review weather hazards prior to imitating field work. 	M
	Heat/cold stress	<ul style="list-style-type: none"> • Wear proper clothing for weather conditions. • Heat: Ensure that shade/shelter and thirst-quenching beverages are available. • Cold: Ensure that warming stations and warm, non-dehydrating beverages are available. • Remind workers to observe physiological indications. • Protect instruments from thermal shock and other weather impacts. • Wear sunscreen. 	M
	Biological hazards	<ul style="list-style-type: none"> • Wear PPE as specified in the SSHP (Appendix A). • Avoid contact with insects and animals. • Inform the SSHO of any allergy to stings/bites and have medication on-site. • Use insect repellent. 	M
	Handling heavy objects	<ul style="list-style-type: none"> • Use proper lifting techniques. • Observe maximum weight limits (50 pounds per person for manual lift). • Use mechanical equipment for heavy or awkward loads. 	M
	Sharp objects	<ul style="list-style-type: none"> • Wear ANSI Level III cut-resistant gloves when handling sharp objects. • Use caution when cutting. Cut away from person/body. • Inspect power tools for safe operation before use. • Keep guards in place during power tool use. 	M
	Potential exposure to chemical contaminants	<ul style="list-style-type: none"> • Avoid activities that disturb areas with distressed vegetation. • Avoid areas that exhibit unusual characteristics (odor, color) or other signs of contamination until properly evaluated. • Modify PPE as required by conditions. 	L
EQUIPMENT	TRAINING	INSPECTIONS	
Vehicle	<ul style="list-style-type: none"> • Current driver's license • Daily safety meetings • Defensive Driver Training 	Driver performs daily inspection of vehicle.	

Project/Location: Keyport, Washington		Job Task: Mobilization and demobilization	
Date: 6/3/21	Prepared by: Demetrio Cabanillas,	Reviewed by:	
	Competent Person (CP): AECOM-Josie Smith, Nathan Gwyn		
First aid kit	Current Red Cross (or equivalent) first aid certification	SSHO inspects kit after use and replaces items as needed.	
Photoionization detector (PID)	Field Lead must have previous experience using PID	Field Lead inspects once daily prior to use and recharges at the end of the day.	

Key to risk assessment code (RAC): An analysis of relative risk has been made for each task and hazard. Codes are designated as follows: E = extremely high risk, H = high risk, M = moderate risk, L = low risk.

Table A-2: Activity Hazard Analysis for Geophysical Survey, Land Survey and Subsurface Utility Clearance

Project/Location: Keyport, Washington		Job Task: Noninvasive site investigation activities, Geophysical survey/land survey/utility locate	
	Prepared by: Demetrio Cabanillas,	Reviewed by:	
Date: 6/3/21	Competent Person (CP): AECOM-Josie Smith, Nathan Gwyn		
JOB STEPS	HAZARDS	CONTROLS	RAC
Non-invasive site investigation activities	Slips, trips, falls	<ul style="list-style-type: none"> • Be aware of changing terrain, wet ground, animal burrows, and general debris. • Ensure that instrument wires, straps, and cables do not interfere with walking. 	M
	Stepping on sharp and/or protruding objects	<ul style="list-style-type: none"> • Workers must be aware of changing terrain when moving around site on foot. • Proper safety footwear will minimize the potential for foot injury. • Be aware of damaged fencing wire, and posts. 	M
	Carrying objects/equipment	<ul style="list-style-type: none"> • Use instrument straps, backpacks to properly distribute load, and free hands. • Use mechanical assistance when possible. 	M
	Potential exposure to chemical and radiological contaminants	<ul style="list-style-type: none"> • Avoid activities that disturb areas with distressed vegetation. • Avoid areas that exhibit unusual characteristics (odor, color) or other signs of contamination until properly evaluated. • Modify PPE as required by conditions. 	M
	Heat/cold stress	<ul style="list-style-type: none"> • Wear proper clothing for weather conditions. • Heat: Ensure that shade/shelter and thirst-quenching beverages are available. • Cold: Ensure that warming stations and warm, non-dehydrating beverages are available. • Remind workers to observe physiological indications. • Protect instruments from thermal shock and other weather impacts. • Wear sunscreen. 	M
	Biological hazards	<ul style="list-style-type: none"> • Wear PPE as specified in the SSHP (Appendix D). • Avoid contact with insects and animals. • Inform the SSHO of any allergy to stings/bites and have medication on site. • Use insect repellent. 	M

Project/Location: Keyport, Washington		Job Task: Noninvasive site investigation activities, Geophysical survey/land survey/utility locate	
Date: 6/3/21	Prepared by: Demetrio Cabanillas,	Reviewed by:	
	Competent Person (CP): AECOM-Josie Smith, Nathan Gwyn		
Survey/utility locate	Underground utilities	<ul style="list-style-type: none"> Confirm that all utilities at the site have been marked. Should utility markings be missing, the SSHO shall contact the utility company to confirm that they: 1) cleared the location, and 2) there are no utilities present. Identify all underground utilities at the site before work commences. Clear borings to 5 feet using manual methods such as a hand auger, post-hole tool, or air knife. Cease work immediately and re-evaluate if utilities or utility markers are uncovered. Cease work immediately, call utility company and appropriate emergency crews if a utility is accidentally hit. 	H
	Overhead utilities	<ul style="list-style-type: none"> Identify all overhead utilities at the site before work commences. Identify all power line voltages by contacting the utility company. Determine overhead power line voltage prior to approach to ensure that minimum distance is maintained. 	H
	Handling heavy objects	<ul style="list-style-type: none"> Use proper lifting techniques. Observe maximum weight limits (50 pounds per person for manual lift). Use mechanical equipment for heavy or awkward loads. 	M
	Sharp objects	<ul style="list-style-type: none"> Wear cut-resistant gloves when handling sharp objects. Use caution when cutting acetate liners and handling sample bottles. 	M
	Equipment rotation and pinch points	<ul style="list-style-type: none"> Identify parts of equipment that may cause personal injury. Maintain all equipment in safe condition. Keep all equipment guards in place during use. De-energize/lockout equipment before maintenance. 	M
	Use of hand and power tools	<ul style="list-style-type: none"> Follow manufacturer's operating instructions. Wear minimum Level D PPE: eye protection, safety-toed boots, work gloves, long-sleeved shirt, and full-length pants. 	M
EQUIPMENT	TRAINING	INSPECTIONS	
Modified level D PPE	<ul style="list-style-type: none"> HAZWOPER 40-hour Current 8-hour refresher Site safety briefing 	Inspect PPE prior to use.	
Survey/GPS equipment/PID	<ul style="list-style-type: none"> Manufacturer's recommendations 	Inspect/calibrate instrumentation per manufacturer's instructions; ensure that reception is satisfactory.	

Key to risk assessment code (RAC): An analysis of relative risk has been made for each task and hazard. Codes are designated as follows: E = extremely high risk, H = high risk, M = moderate risk, L = low risk.

Table A-3: Activity Hazard Analysis for Drilling Operations, Well Installation and Subsurface Sampling

Project/Location: Keyport, Washington		Job Task: General, drilling oversight (Direct Push, Hollow Stem Auger, Rotosonic) and Monitoring Well Installation	
	Prepared by: Demetrio Cabanillas,	Reviewed by:	
Date: 6/3/2021	Competent Person (CP): AECOM-Josie Smith, Nathan Gwyn		
JOB STEPS	HAZARDS	CONTROLS	RAC
General	Slips trips, falls; hand injury	<ul style="list-style-type: none"> • Maintain clean work areas by following good housekeeping procedures. • Do not walk on stockpiled soil or cross open trenches. Walk around, or if subcontractor has provided means for crossing trenches, use those means to cross. • Avoid uneven terrain and steep slopes. • Footwear should have tread in good condition. • Be alert to potential deterioration of walking and working surfaces and support structures. • Avoid talking on the phone or using mobile devices when walking so you can maintain focus on changes in terrain, depressions hidden by vegetation, biological hazards, or other hazards. Stand still when using mobile device or talking on the phone. • Inspect area for slip, trip, and fall hazards. Remove hazard, if possible, or mark it. Designate foot traffic paths and keep these pathways clear of snow, ice, obstructions. • Step slowly and tentatively in tall grass where the ground can't be seen to avoid depressions or other obstacles that could cause ankle or knee sprains. • Avoid putting hands in pinch points or in the "line of fire"; use three points of contact when accessing heavy equipment, and wear leather gloves and proper PPE. 	M
	Handling heavy objects	<ul style="list-style-type: none"> • Use proper lifting techniques. • Observe maximum weight limits (50 pounds per person for manual lift). • Use mechanical equipment for heavy or awkward loads. 	M
	Use of hand and power tools	<ul style="list-style-type: none"> • Follow manufacturer's operating instructions. • Wear minimum Level D PPE: eye protection, safety-toed boots, work gloves, long-sleeved shirt, and full-length pants. 	M
	Heat/cold stress	<ul style="list-style-type: none"> • Wear proper clothing for weather conditions. • Heat: Ensure that shade/shelter and thirst-quenching beverages are available. • Cold: Ensure that warming stations and warm, non-dehydrating beverages are available. • Remind workers to observe physiological indications. • Wear sunscreen (Pre-approved PFAS-free).. 	M
General (cont'd)	Biological hazards	<ul style="list-style-type: none"> • Wear PPE as specified in the SSHP (Appendix A). • Don mosquito repellent as needed. • Avoid contact with insects and animals. • Inform the SSSH of any allergy to stings/bites and have medication on-site. • Use insect repellent. Pre-approved (PFAS-free) natural insect repellent, and light-colored clothing 	M

Drilling	Drill rigs; personal injury, property damage, or equipment damage	<ul style="list-style-type: none"> • Be observant as to your location with respect to moving and overhead parts. • Barricade or rope off the drilling area. • Restrict entry to drilling area to authorized persons only. • Wear hard hat, steel-toe boots, and safety glasses at all times. • Approach the drill rig only after making eye contact with the operator and then only when necessary. • Ensure that only qualified personnel operate the drill rig. 	H
	Equipment Decontamination	<ul style="list-style-type: none"> • Utilize dedicated and disposable sampling equipment to the maximum extent possible. • Decontaminate equipment by use of a water rinse station to remove gross contamination, followed by washing with a non-phosphate detergent (e.g., Liquinox) using a scrub brush, and a double rinse with PFAS-free, de-ionized water. 	L
	Underground/overhead utilities, struck by heavy equipment, equipment failure, unauthorized entry	<ul style="list-style-type: none"> • Post proper signage and delineation to demarcate work areas. • Check excavation locations for underground and overhead utilities. • Protocol for underground utilities location on Adak includes the following: performing a background/records assessment of known utilities or other subsurface obstructions; subcontracting a private utility locator to locate all subsurface utilities in the investigation area; conducting an independent field survey to locate, identify, and mark utilities or obstructions; and performing a visual survey of the area to validate the chosen location (see safety plan and utility locate AHA for details). • If excavation is conducted within 5 feet of an underground utility (or when there is uncertainty about location), positive locations of utilities must be physically verified with non-aggressive means, such as with air or water knifing or hand digging/auguring, prior to proceeding with excavation. 	H
Drilling (cont'd)	Underground/overhead utilities, struck by heavy equipment, equipment failure, unauthorized entry (cont'd)	<ul style="list-style-type: none"> • Mechanical excavation/drilling methods are never allowed within 5 feet of an identified high-risk utility. • If an obstruction is encountered, suspend work and determine what the obstruction is. If it cannot be determined, contact the Health and Safety Manager (HSEM) or client. • All locations will be marked with paint for utility location. Work will not proceed until underground utilities have been cleared. • Deviation from these requirements must be approved by the Project Manager (PM) and HSM. • If overhead lines are present, consult the minimum approach distance table included in the EN HSE handbook and attached SH&E Procedure. • Know the voltage of nearby overhead lines. Typically, 10 feet approach distance, but if voltage is more than 50 kilovolts, then additional clearance is required (see EN HSE Handbook or standard operating procedure). • Contact overhead line operator and verify height of lines. Verify reach and height of equipment. • Contact HSM and PM to discuss work within 20 feet of an overhead power line. • Place signage warning of overhead power lines if in area. • Use a dedicated spotter for work in proximity of power lines. 	
	Equipment rotation and pinch points	<ul style="list-style-type: none"> • Identify parts of equipment that may cause personal injury. • Maintain all equipment in safe condition. • Keep all equipment guards in place during use. • De-energize/lockout equipment before maintenance. 	M

	Sharp objects	<ul style="list-style-type: none"> • Wear cut-resistant gloves when handling sharp objects or glassware. • Use caution when cutting acetate liners and handling sample bottles. 	M
Drilling (cont'd)	Inhalation exposure to vapors or hazardous substances	<ul style="list-style-type: none"> • Monitor the area during operations to identify substances. • Provide workers with appropriate protection for the identified hazards. • 4/5-gas meter to check air quality (oxygen, lower explosive limit, volatile organic compounds, carbon monoxide, hydrogen sulfide, dust) in areas around spoil piles, operator's location, and ground personnel breathing zone. • Review COCs and PPE requirements in APP/SSHP. • Use appropriate decontamination listed in APP/SSHP. Establish waste area for disposal of PPE. • Stop work if unknown drums, pipe, or other such items are found. • If vapor or dust is detected, use vapor suppressant (such as Biosolve) or dust control. 	L
	Dermal exposure to contaminated media	<ul style="list-style-type: none"> • Wear nitrile gloves when handling samples. • Use care when filling sample bottles to avoid spilling the sample. • Follow decontamination procedures. 	L
IDW Handling	Chemical exposure potential	<ul style="list-style-type: none"> • Follow proper decontamination procedures • Wear nitrile gloves while handling IDW containers, ect. • Wear safety glasses when there is potential for splashing. 	L
	Splash Hazards/Spills	<ul style="list-style-type: none"> • Inspect Drums/Containers prior to use for integrity and contaminants. • Pour water from buckets into drums/containers as soon as practicable. • Provide for secondary containment where required by regulation or contract, and where a spill could result in significant hazard or economic loss. • In the event of a spill or release, take immediate measures to control and contain the release, including contacting local emergency service providers, if necessary, isolate and contain hazardous release areas, and deny entry to the spill area to unauthorized personnel. Personnel should stay upwind, keep out of low areas, and keep combustible materials away from the spilled material. • If a spill is liquid, prevent the discharge from traveling beyond site boundaries, and prevent spilled materials from reaching storm water receptacle, ditches, creeks and drainage canals, • Take caution when handling drums and containers. • Review the appropriate SDS for more information on spill clean-up procedures. • Place used PPE and disposable sampling equipment in garbage bags to be disposed of properly. 	L
EQUIPMENT	TRAINING	INSPECTIONS	
Level D PPE	<ul style="list-style-type: none"> • HAZWOPER 40-hour • Current 8-hour refresher • Site safety briefing 	<ul style="list-style-type: none"> • Inspect PPE prior to use. 	
PID	Manufacturer's recommendations Trained in proper use of equipment	<ul style="list-style-type: none"> • Inspect/calibrate instrumentation per manufacturer's instructions; ensure that reception is satisfactory. • Operator performs daily inspection. Check all required safety devices. 	

Hand tools	Trained in proper use of equipment	<ul style="list-style-type: none">• Operator performs daily inspection. Check all required safety devices.• Inspect tools upon arrival to the site and daily prior to start of work.• Inspect equipment per manufacturer's recommendations and good industry practice.	
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Key to risk assessment code (RAC): An analysis of relative risk has been made for each task and hazard. Codes are designated as follows: E = extremely high risk, H = high risk, M = moderate risk, L = low risk.

Table A-4: Activity Hazard Analysis Groundwater, and Soil Sampling

Project/Location: Keyport, Washington		Job Task: General, sample collection	
Date: 6/3/2021	Prepared by: Demetrio Cabanillas,	Reviewed by:	
	Competent Person (CP): AECOM-Josie Smith, Nathan Gwyn		
JOB STEPS	HAZARDS	CONTROLS	RAC
General	Slips trips, falls; hand injury	<ul style="list-style-type: none"> • Maintain clean work areas by following good housekeeping procedures. • Do not walk on stockpiled soil or cross open trenches. Walk around, or if subcontractor has provided means for crossing trenches, use those means to cross. • Avoid uneven terrain and steep slopes. • Footwear should have tread in good condition. • Be alert to potential deterioration of walking and working surfaces and support structures. • Avoid talking on the phone or using mobile devices when walking so you can maintain focus on changes in terrain, depressions hidden by vegetation, biological hazards, or other hazards. Stand still when using a mobile device or talking on the phone. • Inspect area for slip, trip, and fall hazards. Remove hazard, if possible, or mark it. Designate foot traffic paths and keep these pathways clear of snow, ice, obstructions. • Step slowly and tentatively in tall grass where the ground can't be seen to avoid depressions or other obstacles that could cause ankle or knee sprains. • Avoid putting hands in pinch points or in the "line of fire"; use three points of contact when accessing heavy equipment, and wear leather gloves and proper personal protective equipment (PPE). 	M
	Handling heavy objects	<ul style="list-style-type: none"> • Use proper lifting techniques. • Observe maximum weight limits (50 pounds per person for manual lift). • Use mechanical equipment for heavy or awkward loads. 	M
	Use of hand and power tools	<ul style="list-style-type: none"> • Follow manufacturer's operating instructions. • Wear minimum Level D PPE: eye protection, safety-toed boots, work gloves, long-sleeved shirt, and full-length pants. 	M
	Heat/cold stress	<ul style="list-style-type: none"> • Wear proper clothing for weather conditions. • Heat: Ensure that shade/shelter and thirst-quenching beverages are available. • Cold: Ensure that warming stations and warm, non-dehydrating beverages are available. • Remind workers to observe physiological indications. • Wear sunscreen (Pre-approved PFAS-free). 	M
General (cont'd)	Biological hazards	<ul style="list-style-type: none"> • Wear PPE as specified in the SSHP (Appendix A). • Avoid contact with insects and animals. • Inform the SSHO of any allergy to stings/bites and have medication on-site. • Use insect repellent. Pre-approved (PFAS-free) natural insect repellent, and light-colored clothing. 	M

Project/Location: Keyport, Washington		Job Task: General, sample collection	
Date: 6/3/2021	Prepared by: Demetrio Cabanillas,	Reviewed by:	
	Competent Person (CP): AECOM-Josie Smith, Nathan Gwyn		
Sample collection	Obtaining samples	<ul style="list-style-type: none"> • Use caution when opening and closing well monuments, be mindful of pinch points and biological hazards in well monuments. • Use caution and take breaks when repetitive motions are necessary to obtain samples (such as bailing, hand auguring, or lowering or lifting pumping equipment). • Use the correct tool for the task, no substituting. • Take care when filling sample containers to avoid spilling any of the sample on the ground or yourself. 	M
	Sharp objects	<ul style="list-style-type: none"> • Wear cut-resistant gloves when handling sharp objects or glassware. • Use caution when cutting acetate liners and handling sample bottles. 	M
	Equipment rotation and pinch points	<ul style="list-style-type: none"> • Identify parts of equipment that may cause personal injury. • Maintain all equipment in safe condition. • Keep all equipment guards in place during use. • De-energize/lockout equipment before maintenance. 	M
	Inhalation exposure to vapors or hazardous substances	<ul style="list-style-type: none"> • Monitor the area during operations to identify substances. • Provide workers with appropriate protection for the identified hazards. • Use air monitoring equipment to check air quality (oxygen, lower explosive limit, volatile organic compounds, carbon monoxide, hydrogen sulfide, dust) in areas around spoil piles, operator's location, and ground personnel breathing zone. • Review COCs and PPE requirements in APP/SSHP. • Use appropriate decontamination listed in APP/SSHP. Establish waste area for disposal of PPE. • Stop work if unknown drums, pipe, or other such items are found. • If vapor or dust is detected, use vapor suppressant (such as Biosolve) or dust control. 	L
	Dermal exposure to contaminated media	<ul style="list-style-type: none"> • Wear nitrile gloves when handling samples. • Use care when filling sample bottles to avoid spilling the sample • Follow decontamination procedures. 	L
EQUIPMENT	TRAINING	INSPECTIONS	
Level D PPE	<ul style="list-style-type: none"> • HAZWOPER 40-hour • Current 8-hour refresher • Site safety briefing 	<ul style="list-style-type: none"> • Inspect PPE prior to use. 	
Hand tools	Trained in proper use of equipment	<ul style="list-style-type: none"> • Operator performs daily inspection. Check all required safety devices. • Inspect tools upon arrival to the site and daily prior to start of work. • Inspect equipment per manufacturer's recommendations and good industry practice. 	
PID Water Quality Meter	Trained in proper use of equipment	<ul style="list-style-type: none"> • Calibrate daily. 	

Key to risk assessment code (RAC): An analysis of relative risk has been made for each task and hazard. Codes are designated as follows: E = extremely high risk, H = high risk, M = moderate risk, L = low risk.

Table A-5: Activity Hazard Analysis Monitoring Well Development

Project/Location: Keyport, Washington		Job Task: General, groundwater monitoring well development and sampling	
Date: 6/3/2021	Prepared by: Demetrio Cabanillas	Reviewed by:	
	Competent Person (CP): AECOM-Josie Smith, Nathan Gwyn		
JOB STEPS	HAZARDS	CONTROLS	RAC
General	Slips trips, falls; hand injury	<ul style="list-style-type: none"> • Maintain clean work areas by following good housekeeping procedures. • Do not walk on stockpiled soil or cross open trenches. Walk around, or if subcontractor has provided means for crossing trenches, use those means to cross. • Avoid uneven terrain and steep slopes. • Footwear should have tread in good condition. • Be alert to potential deterioration of walking and working surfaces and support structures. • Avoid talking on the phone or using mobile devices when walking so you can maintain focus on changes in terrain, depressions hidden by vegetation, biological hazards, or other hazards. Stand still when using a mobile device or talking on the phone. • Inspect area for slip, trip, and fall hazards. Remove hazard, if possible, or mark it. Designate foot traffic paths and keep these pathways clear of snow, ice, obstructions. • Step slowly and tentatively in tall grass where the ground can't be seen to avoid depressions or other obstacles that could cause ankle or knee sprains. • Avoid putting hands in pinch points or in the "line of fire"; use three points of contact when accessing heavy equipment, and wear leather gloves and proper personal protective equipment (PPE). 	M
	Handling heavy objects	<ul style="list-style-type: none"> • Use proper lifting techniques. • Observe maximum weight limits (50 pounds per person for manual lift). • Use mechanical equipment for heavy or awkward loads. 	M
	Use of hand and power tools	<ul style="list-style-type: none"> • Follow manufacturer's operating instructions. • Wear minimum Level D PPE: eye protection, safety-toed boots, work gloves, long-sleeved shirt, and full-length pants. 	M
	Heat/cold stress	<ul style="list-style-type: none"> • Wear proper clothing for weather conditions. • Heat: Ensure that shade/shelter and thirst-quenching beverages are available. • Cold: Ensure that warming stations and warm, non-dehydrating beverages are available. • Remind workers to observe physiological indications. • Wear sunscreen (Pre-approved PFAS-free). 	M
General (cont'd)	Biological hazards	<ul style="list-style-type: none"> • Wear PPE as specified in the SSHP (Appendix A). • Avoid contact with insects and animals. • Inform the SSHO of any allergy to stings/bites and have medication on-site. • Use insect repellent. Pre-approved (PFAS-free) natural insect repellent, and light-colored clothing. 	M
	Traffic in roadways and parking lots	<ul style="list-style-type: none"> • Use combination of vehicles, cones, traffic barriers and caution tape. 	L

Project/Location: Keyport, Washington		Job Task: General, groundwater monitoring well development and sampling	
Date: 6/3/2021	Prepared by: Demetrio Cabanillas	Reviewed by:	
	Competent Person (CP): AECOM-Josie Smith, Nathan Gwyn		
Establish Exclusion Zone around well and unload/set-up equipment		<ul style="list-style-type: none"> • A traffic plan may be necessary depending on location 	
	Cuts/Scrapes	<ul style="list-style-type: none"> • Wear leather gloves when un-bolting well lid. 	L
	Stacking heights	<ul style="list-style-type: none"> • Avoid stacking equipment and boxes. 	L
Sampling/develop purge using a bailer or pump	Obtaining samples	<ul style="list-style-type: none"> • Use caution when opening and closing well monuments, be mindful of pinch points and biological hazards in well monuments. • Take breaks when performing repetitive motions every 30 minutes or more frequently if necessary to obtain samples (such as bailing, hand auguring, or lowering or lifting pumping equipment). • Use the correct tool for the task, no substituting. • Take care when filling sample containers not to have any leaks. 	M
	Handling heavy objects	<ul style="list-style-type: none"> • Use proper lifting techniques. • Observe maximum weight limits (50 pounds per person manual lift). • Use mechanical equipment for heavy or awkward loads. 	M
	Sharp objects	<ul style="list-style-type: none"> • Wear cut-resistant gloves when handling sharp objects. • Use caution when cutting acetate liners and handling sample bottles. 	M
	Inhalation and contact with hazardous substances	<ul style="list-style-type: none"> • Monitor the area during operations to identify substances. • Provide workers with appropriate protection for the identified hazards. • Avoid creating dust; implement dust controls as needed. • Post proper signage and demarcate work areas. • Use air monitoring equipment to check air quality (oxygen, lower explosive limit, volatile organic compounds, carbon monoxide, hydrogen sulfide, dust) in areas around spoil piles, operator's location, and ground personnel breathing zone. • Review COCs and PPE requirements in APP/SSHP. • Use booties and additional PPE as indicated in APP/SSHP if contact with COCs is possible. • Use appropriate decontamination listed in APP/SSHP. Establish waste area for disposal of PPE. • Stop work if unknown drums, pipe, or other such items are found. • If vapor or dust is detected, use vapor suppressant (such as Biosolve) or dust control. 	M
	Electrical	<ul style="list-style-type: none"> • Ensure employees are properly trained in the use of the compressors, e.g., use correct contacts for 12-volt batteries and avoid arcing situations. 	L
	Compressed gas cylinders	<ul style="list-style-type: none"> • Cylinders are not to be used unless they have standardized markings showing that they have been tested as required by regulations. • All cylinders shall be stored upright, with caps in place; and secured. • Inspect cylinders prior to use. 	L

Project/Location: Keyport, Washington		Job Task: General, groundwater monitoring well development and sampling	
Date: 6/3/2021	Prepared by: Demetrio Cabanillas	Reviewed by:	
	Competent Person (CP): AECOM-Josie Smith, Nathan Gwyn		
	Use of hand and power tools	<ul style="list-style-type: none"> Follow manufacturer’s operating instructions. Wear minimum Level D PPE: eye protection, safety-toed boots, work gloves, long-sleeved shirt, and full-length pants. 	M
Decontamination	Equipment Decontamination	<ul style="list-style-type: none"> Utilize dedicated and disposable sampling equipment to the maximum extent possible. Decontaminate equipment by use of a water rinse station to remove gross contamination, followed by washing with a non-phosphate detergent (e.g., Liquinox) using a scrub brush, and a double rinse with PFAS-free, de-ionized water. 	L
	Personnel Decontamination	<ul style="list-style-type: none"> Keep PPE clean at all times. Maintain PPE in accordance with the manufacturer’s requirements. Wear modified level D PPE when necessary to prevent chemical exposure (non-coated Tyvek and face shields or dust masks), as designated by the SSHO. For items used inside an exclusion zone, ensure that the PPE is properly decontaminated in the Contaminate Reduction Zone before removing the item from the exclusion zone. Do not reuse PPE and gloves. Dispose of PPE and gloves of in labeled trash bags. 	L
EQUIPMENT	TRAINING	INSPECTIONS	
Level D PPE	<ul style="list-style-type: none"> HAZWOPER 40-hour Current 8-hour refresher Site safety briefing 	<ul style="list-style-type: none"> Inspect PPE prior to use. 	
Hand tools	Trained in proper use of equipment	<ul style="list-style-type: none"> Operator performs daily inspection. Check all required safety devices. Inspect tools upon arrival to the site and daily prior to start of work. Inspect equipment per manufacturer’s recommendations and good industry practice. 	
PID, Pump, Water Quality Meter	Trained in proper use of equipment	<ul style="list-style-type: none"> Calibrate daily. 	

Key to risk assessment code (RAC): An analysis of relative risk has been made for each task and hazard. Codes are designated as follows: E = extremely high risk, H = high risk, M = moderate risk, L = low risk.

Table A-6: Activity Hazard Analysis for Equipment Decontamination

Project/Location: Keyport, Washington		Job Task: Equipment Decontamination	
	Prepared by: Demetrio Cabanillas	Reviewed by:	
Date: 6/3/2021	Competent Person (CP): AECOM-Josie Smith, Nathan Gwyn		
JOB STEPS	HAZARDS	CONTROLS	RAC
Equipment decontamination	Contact with hazardous contaminants	<ul style="list-style-type: none"> Minimize contact with contaminated equipment. Wear appropriate PPE as required. 	L
	Use decontamination methods (brushes, wipes)	<ul style="list-style-type: none"> Limit dust generation. Take proper precautions and wear PPE. Waste will be drummed. 	M
	Slips, trips, and falls	<ul style="list-style-type: none"> Exercise caution when walking around equipment and wet surfaces if present. 	M
	Injury from pressure washers	<ul style="list-style-type: none"> Ensure operators are trained in equipment use. Use proper protective clothing, especially eye and face protection. Workers not involved with the operation should stand clear. 	M
	Equipment rotation and pinch points	<ul style="list-style-type: none"> Identify parts of equipment that may cause personal injury. Maintain all equipment in a safe condition. De-energize/lockout equipment before decontamination. 	M
	Electrocution	<ul style="list-style-type: none"> Ground-fault circuitry should be used on all electrical equipment. Inspect electrical cords and equipment before use. 	M
EQUIPMENT	TRAINING	INSPECTIONS	
Level D PPE	<ul style="list-style-type: none"> HAZWOPER 40-hour Current 8-hour refresher Site safety briefing 	<ul style="list-style-type: none"> Inspect PPE prior to use. 	
Pressure-washer/steam-cleaner (if necessary)	Trained in proper use of equipment	<ul style="list-style-type: none"> Operator performs daily inspection. Check all required safety devices. Inspect equipment per manufacturer's recommendations and good industry practice. 	

Key to risk assessment code (RAC): An analysis of relative risk has been made for each task and hazard. Codes are designated as follows: E = extremely high risk, H = high risk, M = moderate risk, L = low risk.

Table A-7: Activity Hazard Analysis for Site Restoration and Demobilization

Project/Location: Keyport, Washington		Job Task: Travel	
Date: 6/3/2021	Prepared by: Demetrio Cabanillas	Reviewed by:	
	Competent Person (CP): AECOM-Josie Smith, Nathan Gwyn		
JOB STEPS	HAZARDS	CONTROLS	RAC
Travel to and from site and at the site	Operation of motor vehicles	<ul style="list-style-type: none"> • Comply with all federal, state, local, and site regulations. • Inspect vehicles daily and document inspections. • Drive defensively. • Do not use cell phones or hands-free devices while driving. • Wear seatbelts while vehicles are in motion. • Avoid backing the vehicle whenever possible. • Ensure driver has valid driver’s license. • Consider weather conditions; modify speed and distance accordingly. • Follow facility requirements for access, speed limits, parking, etc. 	M
	Handling heavy objects	<ul style="list-style-type: none"> • Use proper lifting techniques. • Observe maximum weight limits (50 pounds per person for manual lift). • Use mechanical equipment for heavy or awkward loads. 	M
EQUIPMENT	TRAINING	INSPECTIONS	
Vehicles, trucks/ trailers	Current driver’s license	<ul style="list-style-type: none"> • Inspect vehicle daily. 	

Key to risk assessment code (RAC): An analysis of relative risk has been made for each task and hazard. Codes are designated as follows: E = extremely high risk, H = high risk, M = moderate risk, L = low risk.

Table A-8: Activity Hazard Analysis for Investigation-Derived Waste (IDW) Handling

Project/Location: Keyport, Washington		Job Task: IDW accumulation, shipment/disposal	
Date: 11/20/20	Prepared by: Demetrio Cabanillas	Reviewed by:	
	Competent Person (CP): AECOM-Josie Smith, Nathan Gwyn		
JOB STEPS	HAZARDS	CONTROLS	RAC
IDW accumulation	Spills/containment issues	<ul style="list-style-type: none"> • Use caution when filling drums with waste material, have spill kits ready and/or use plastic to contain possible spills. • Make sure drums are stored on a flat hard surface for mobility and to prevent from tipping over or loss of containment. • Avoid manual lifting where possible. Use a buddy to help lift smaller containers. Make sure lids are secured prior to moving the container. Keep spill kits on hand with absorbents, shovels. Clean up spills immediately. Keep work free of unnecessary tools or equipment. • Wear appropriate PPE (nitrile gloves, safety glasses, steel-toed boots) and follow decontamination procedures. 	M
	Slips trips, falls	<ul style="list-style-type: none"> • Maintain clean work areas by following good housekeeping procedures. • Avoid uneven terrain and steep slopes. • Footwear should have tread in good condition. • Be alert to potential deterioration of walking and working surfaces and support structures. • Avoid talking on the phone or using mobile devices when walking so you can maintain focus on changes in terrain, depressions hidden by vegetation, biological hazards, or other hazards. Stand still when using mobile device or talking on the phone. • Inspect area for slip, trip, and fall hazards. Remove hazard, if possible, or mark it. Designate foot traffic paths and keep these pathways clear of snow, ice, obstructions. 	M
	Sharp objects	<ul style="list-style-type: none"> • Wear cut-resistant gloves when handling sharp objects or glassware. • Use caution when handling or opening/closing drums. 	M
	Handling heavy objects	<ul style="list-style-type: none"> • Use proper lifting techniques. • Observe maximum weight limits (50 pounds per person manual lift). • Use mechanical equipment for heavy or awkward loads (drum dolly). 	M

Project/Location: Keyport, Washington		Job Task: IDW accumulation, shipment/disposal	
Date: 11/20/20	Prepared by: Demetrio Cabanillas	Reviewed by:	
	Competent Person (CP): AECOM-Josie Smith, Nathan Gwyn		
Shipment/ disposal	Loading Drums	<ul style="list-style-type: none"> • Maintain clean work areas by following good housekeeping procedures. • Inspect area for slip, trip, and fall hazards. Remove hazard, if possible, or mark it. Designate foot traffic paths and keep these pathways clear of snow, ice, obstructions. • Avoid uneven terrain and steep slopes. • Wear cut-resistant gloves when handling drums. • Use proper lifting techniques. • Observe maximum weight limits (50 pounds per person manual lift). • Use mechanical equipment for heavy or awkward loads (drum dolly). 	M
	Transporting drums	<ul style="list-style-type: none"> • Make sure all drums are completely secured to avoid shifting, tipping, or spilling of load during transit. • Verify all drums are properly labeled to be in compliance with shipping regulations. • Carry all the proper paperwork when transporting the waste. 	M
	Returning unused preservatives	<ul style="list-style-type: none"> • Notify the project manager and discuss the process of how to return unused preservatives safely. • Coordinate with Alaska Airlines to ensure that they have an authorized person to accept and handle these materials. • Verify the designated shipper has all required shipper training. 	M
EQUIPMENT	TRAINING	INSPECTIONS	
Level D PPE and PFD as appropriate	<ul style="list-style-type: none"> • HAZWOPER 40 hour • Current 8-hour refresher • Site safety briefing 	<ul style="list-style-type: none"> • Inspect PPE prior to use. 	

Key to risk assessment code (RAC): An analysis of relative risk has been made for each task and hazard. Codes are designated as follows: E = extremely high risk, H = high risk, M = moderate risk, L = low risk.

Table A-9: Activity Hazard Analysis for Coronavirus (COVID-19) Exposure

Project/Location: Keyport, Washington		Job Task: Precautions for Coronavirus	
	Prepared by: Demetrio Cabanillas	Reviewed by:	
Date: 6/3/2021	Competent Person (CP): AECOM-Josie Smith, Nathan Gwyn		
JOB STEPS	HAZARDS	CONTROLS	RAC
Fitness for duty/check-in	Exposing others to virus	<ul style="list-style-type: none"> ● Inform supervisor and stay quarantined from others if you feel sick. ● Ensure you are fit for duty and have not been in any of these situations: <ul style="list-style-type: none"> ○ I have had close contact with a confirmed case or a symptomatic person under investigation for coronavirus in the last 14 days. ○ A doctor requested me to be tested for coronavirus or instructed me to self-quarantine. ○ A member of my household or someone I was in close contact within the last 14 days experienced some of the following symptoms: fever, cough, shortness of breath, fatigue, sore throat, chills, gastro-intestinal disease or diarrhea, loss of taste/smell. ○ I have or previously had some of the following symptoms in the last 7 days: fever or chills, cough, shortness of breath or difficulty breathing, fatigue, muscle or body ache, headache, new loss of taste/smell, sore throat, congestion or runny nose, nausea or vomiting, or diarrhea. ○ My temperature check today shows a fever, without the use of fever reducing medications in the last 24 hours (100.4 F [37.8C] or above or exceeding criteria required by local order or client requirements). ○ If your response to any of these statements is a YES, then do not go to your workplace. If you are AECOM employee, contact your Supervisor and the AECOM Nurse at 512-419-5016 for advice. ○ If your response is a NO or Yes, but you are released by the AECOM nurse, you can proceed to work. You may be asked to check your temperature again when you arrive to your workplace. 	M
Travel by vehicle	In enclosed space with others	<ul style="list-style-type: none"> ● Limit travel on public transportation (buses, trains, planes, carpooling). If necessary, make sure to wear a face covering the entire time in the vehicle and limit contact with surfaces. Wear gloves or use hand sanitizer. ● If possible, have your own vehicle and limit others in it with you. ● Make sure to wipe down surfaces and sanitize surfaces regularly. 	M
General field work	Working around others	<ul style="list-style-type: none"> ● Maintain a safe working distance of at least 6 feet or more when working with others. ● Wear a face covering if working around others. ● Limit sharing tools and other supplies between multiple people. ● Sanitize all frequent touch points regularly and wear gloves if possible. 	M
General office work	Working around others	<ul style="list-style-type: none"> ● Maintain a safe working distance of at least 6 feet or more when working with others. ● Wear a mask if working in the same room as others and in all common spaces. ● Limit sharing tools and other supplies between multiple people. ● Sanitize all frequent touch points regularly and wear gloves if possible. 	M

Project/Location: Keyport, Washington		Job Task: Precautions for Coronavirus	
Date: 6/3/2021	Prepared by: Demetrio Cabanillas	Reviewed by:	
	Competent Person (CP): AECOM-Josie Smith, Nathan Gwyn		
EQUIPMENT	TRAINING	INSPECTIONS	
Approved mask or face covering Gloves Hand sanitizer or disinfectant	<ul style="list-style-type: none"> Coronavirus training 	<ul style="list-style-type: none"> Inspect PPE prior to use, verify clean mask and gloves. Use sanitizer with 60 percent or more alcohol. 	

Key to risk assessment code (RAC): An analysis of relative risk has been made for each task and hazard. Codes are designated as follows: E = extremely high risk, H = high risk, M = moderate risk, L = low risk.

Appendix B: AECOM OSHA Form 300A

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Appendix C: SSHO Authorization Letter and Employee Certifications

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Josie A. Smith, Senior Scientist, Data Manager

Location: Seattle, WA

EXPERTISE:

Ms. Smith is a senior scientist/data manager with over 27 years of experience in the environmental science field including field research, laboratory production and management, marine environmental restoration projects, environmental chemistry, and environmental data management. She has provided field, chemistry, biology and data management support for multiple Navy Environmental Restoration Projects, and has experience with wide ranging aspects of environmental investigation studies. Ms. Smith has 6 years of experience working as the responsible safety officer for several field projects at CERCLA sites for the U.S. Navy and for commercial clients. Ms. Smith has familiarity with marine fish and invertebrate species and performed extensive bi-coastal field work during her four-year employment with the National Oceanic and Atmospheric Association (NOAA)'s Status and Trends Program conducting coastal monitoring studies, plus more recent field work leading several marine tissue and sediment sampling projects at CERCLA sites in Puget Sound for the US Navy (shore and vessel-based sampling). She has participated in multiple tissue and sediment sampling projects employing numerous collection methods. Ms. Smith also has experience with ship-board and land-based field laboratory mobilization/demobilization and field and laboratory experience with environmental chemistry, bioassay, DNA extraction and visualization, and tissue resection techniques. In addition, she has been site safety officer on various environmental projects for the past 6 years. Projects have been under both state and federal regulations and oversight.

Education:

B.S., Fisheries, University of Washington

Professional Registrations & Licenses:

Certified Project Manager, Washington

Oracle Applications Development Certificate

40-hour HAZWOPR Training, annual refreshers; CPR/First Aid; 8-hour Supervisor

30-hour OSHA Construction Safety

Employment History / Title (14 Years):

Senior Scientist, AECOM, 2004-Present

Project Manager, Laucks, 1997-2004

Aquatic Biologist, Coffey Laboratories 1995-1997

Fisheries Scientist/Biologist, NMFS 1990-1994

Ms. Smith has worked with the AECOM Seattle Environmental Data Management group since 2004 and has experience with Oracle, Access, and EQUIS database applications, and has used Access and Excel extensively for data analysis and reporting. She has been a Navy Regional Data Manager for NAVFAC Northwest environmental database applications throughout her employment with AECOM. Her environmental chemistry, biology, laboratory, and field experience makes her uniquely qualified as an environmental data content expert and she manages and submits environmental data to state and federal database systems including NIRIS and EIM.

In addition, Josie has 9 years of experience in the laboratory production fields of chemistry, biochemistry, biological, and microbiological sectors and has provided project support for procurement, selection, and oversight of environmental laboratories and vessel subcontractors for Navy projects. Her unique combination of practical chemical and sediment/tissue sampling and analysis experience creates valuable efficiencies during the development of SAPs/QAPPs, and she has been a contributing author to multiple Navy SAPs/QAPPs and Reports. Ms. Smith has also provided oversight for sample custody and shipping/receiving requirements for CERCLA projects.

PROJECTS:

Data Management and Installation Restoration Information Management Solution (NIRIS), United State Navy, Seattle, WA (2007-Present). NAVFAC Northwest Regional Data Manager responsible for assuring successful transfer of environmental data from a variety of Navy contractors performing Installation Restoration projects to the NAVY Installation Restoration Information Management Solution (NIRIS), an Oracle enterprise database. This work includes formatting and loading of current and historical environmental data provided by CLEAN and ARCS contractors, management of data, and data exports. Other responsibilities include receipt of data deliverables, generating reports for



summarizing and reporting analytical data, and database maintenance. Also responsible for reviewing and processing user provisioning and reference value requests, and providing Navy RPM and contractor help support for multiple NIRIS end-user web applications.

PSNS Sinclair Inlet Marine Long-term Monitoring Project, United States Navy, Bremerton, WA (2005-2015). Field Team Co-lead and/or Senior Scientist who assisted with planning and execution of tissue sampling for PCBs and mercury speciation in multi trophic level study. Provided SAP production and laboratory procurement support. Supervised vessel subcontractor and field team. Identified target species of pelagic and bottom fish and invertebrates of correct age class/size. Provided laboratory oversight, chemistry data analysis and management and support for report production.

Area 8 Marine Investigation Naval Base Kitsap Keyport Tissue Monitoring, United States Navy, Keyport, WA (June-2015, June 2016). Field Team Lead and Senior Scientist responsible for planning and execution of intertidal clam tissue sampling for metals and arsenic speciation. Led the SAP and QAPP development and production, design elements, and laboratory procurement support. Obtained WDFW Scientific Collection Permit and provided catch report. Supervised a six-person field team. Identified target bivalve species of correct age class/size. Provided laboratory procurement and oversight and chemistry and data management and interpretation support for report production.

Jackson Park OU 1 Long Term Monitoring of Marine Tissue United States Navy, Bremerton, WA (August-2014). Field Team Lead and Senior Scientist responsible for planning and execution of intertidal clam and subtidal crab tissue sampling for metals and ordnance compounds. Obtained WDFW Scientific Collection Permit and provided catch report. Supervised subtidal collection of cancer crabs via vessel deployed traps and intertidal zone clams. Responsible for identifying target crab and bivalve species of correct age class/size, laboratory oversight, chemistry data review and management.

OU B Marine, Long-Term Monitoring and Pre- and Post-Construction Sediment Monitoring, United States Navy, Bremerton, WA (2007-2014). Project chemist and field lead responsible for team preparation of field sampling plans and quality assurance project plans for long term monitoring and pre- and post-construction sediment monitoring on several delivery orders within OU B Marine at the Puget Sound Naval Shipyard. Responsible for laboratory and independent data validation procurement and oversight, data quality reviews and technical data management, including submittal to the Navy and Washington State Department of Ecology database systems (NIRIS and EIM). Also the Field Lead for the 2014 Pier 6 pre-construction Sampling and 2014 Sinclair Inlet Long term monitoring projects.

National Status and Trends Program, National Marine Fisheries Service, Multiple sites in Washington, California, North Carolina, South Carolina, Georgia, and Florida (1990-1994). Fisheries Biologist and, Field Technician for ship- based tissue collection on east and west coasts for multiple bottom fish species and invertebrates, including English sole in the Duwamish Waterway. Duties included shipboard laboratory setup, collection of fish and invertebrates via otter trawl, gill netting, and beach seining, fish and invertebrate species identification for catch surveys, and preparation of tissues for bio-indicator laboratory analysis.

Certificate of Completion

This is to certify that

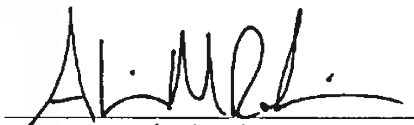
Josie Smith

has satisfactorily completed
40 hours of training in

Hazardous Waste Operations And Emergency Response

to comply with the training requirements of
OSHA 29 CFR 1910.120 and WAC 296-843

Certificate Number **144388**


Instructor



Oct 28 - Nov 1, 2013

Date(s) of Training

Annual Refresher Required by: Nov 1, 2014

Argus Pacific, Inc. • 1900 W. Nickerson • Suite 315 • Seattle, Washington 98119 • 206.285.3373 • fax 206.285.3927



AECOM

University Certificate of Completion

Certificate of Completion 8 Hour HAZWOPER Refresher

This certifies that

Josie Smith

Has completed Annual HAZWOPER 8-Hour Refresher Training,
required by 29 CFR 1910.120(e) and AECOM SH&E Tier III S3NA-117-PR1,
Hazardous Waste Operations

Completed on:
01/28/2021
MM/DD/YYYY

Sue Stephens
Specialist, Safety, Health & Environment



CERTIFICATE OF COMPLETION

HAZWOPER 8-Hour Supervisor Training

This is to recognize that

Josie Smith

Has completed AECOM SH&E Training Course *HAZWOPER 8-Hour Supervisor Training*, required by 29 CFR 1910.120(e) and AECOM SH&E Procedure *S3NA-117-PR1 Hazardous Waste HAZWOPER Activities* on **July 26, 2013**.

A handwritten signature in black ink, appearing to read "Fred Merrill", is positioned above a horizontal line.

Fred Merrill, CSP
Area SH&E Manager, Pacific Northwest

Certificate of Completion





Certificate of Completion

Josie Smith

has successfully completed requirements for

Adult First Aid/CPR/AED

Date Completed: 5/10/2021

Validity Period: 2 - Years

Conducted by: American Red Cross



To verify certificate, scan code or visit redcross.org/digitalcertificate and enter ID.

Learn and be inspired at LifesavingAwards.org



00JK8VQ



Demetrio Cabanillas, EIT

Field Engineer

Work History

- AECOM, 2006 – Present

Education

ME, Environmental Engineering, Utah State University, 2005
BS, Civil/Environmental Engineering, Utah State University, 2003

Years of Experience

With AECOM 11

Registration/Certifications

OSHA 30-Hour Construction Safety
HAZWOPPER 8-hr Supervisor
Training
HAZWOPPER 8-hr Annual Refresher
HAZWOPPER 40-hr Training
MSHA Training
First Aid and CPR

Demetrio Cabanillas is an environmental scientist and engineer who has 12 years of experience in environmental and geotechnical investigation and environmental remediation he has conducted environmental site investigations (Phase I and II ESAs), sediment and soil sampling programs, vapor intrusion and air sampling programs, planning field projects, supervising field staff, construction oversight, writing technical reports, remedial investigation and feasibility reports, compliance monitoring programs and operation and maintenance of groundwater treatment systems. In addition, he has been site safety officer on various environmental projects for the past 7 years. Projects have been under both state and federal regulations and oversight.

Experience

Lindsay Manufacturing, NE. Assisted with remedial investigation work and writing the engineering portions of a feasibility study for a CERCLA remedial action for a chlorinated solvent plume in groundwater.

220 S Dawson St, WA. Field engineer in charge of installing injection wells, monitoring wells and conducting sodium persulfate injections to treat a chlorinated solvent plume. Engineer responsible for writing the engineering design report and compliance monitoring plan. Project also included vapor intrusion, ambient air and indoor air monitoring programs during the injection events.

Multiple Petroleum Facilities (Shell), WA. Project manager and assisted with feasibility reports and injection pilot test work plans for local service stations in western Washington. Contaminants of concern at the sites were TPH gas and diesel in the soil and groundwater.

Laurel Station Cleanup Action, WA. Was the lead field engineer, geotech inspector and site safety officer, in the site cleanup action which consisted of slot cut excavations using slurry excavation methods and installation of a Dual Phase Extraction System. The contaminants of concern were TPH gas, diesel and oil range plumes. Assisted in construction oversight, design and implementation of the DPE treatment system and wrote the operation and maintenance manual. Assisted in training field staff to operate and maintain the DPE system during duration of operation. The DPE system was designed so it can be operated in DPE mode or in Soil Vapor Extraction Mode.

Upper Columbia River Water Sampling, Various Locations, .

Assisted in sample collection of surface water quality samples at various transects along the Columbia River starting at Trail, British Columbia and ending at Grand Coulee Dam. Surface water sample collection employed clean hands techniques to monitor for trace metals, PCB congeners, PBDEs, and other low concentration parameters using agency approved quality assurance project plans and site-specific plans.

Freeport-McMoran Copper & Gold, Safford Mine, Safford, Arizona.

Assisted in round the clock piezometer installation, on a heap leach pad. Assigned to a drill crew and made sure piezometers were installed to specifications and modified the installation procedures if problems arose.

US Navy, Petroleum Characterization, Adak NB, Alaska. Assisted in site investigation, vapor sampling, groundwater sampling, and drilling at the former base. Installed nine vapor wells, and was site safety officer

Belshaw Brothers DPE System, WA. Field engineer in charge of weekly operation and maintenance of a DPE treatment system; consisting of 6 extraction wells treating petroleum hydrocarbons and benzene. Operation and Monitoring included basic mechanical operation, collecting influent and effluent groundwater samples as well as effluent vapor samples leaving the DPE system.

Former Magic Cleaners SVE System and Air Stripping Wells, WA.

Field engineer in charge of the construction oversight and installation of an SVE treatment system; also conducted the operation and maintenance of air stripping wells that were installed to treat VOCs in the groundwater; Monitoring included basic mechanical operation tasks, quarterly water level measurements in the wells; checks for sediment accumulation in the wells and adjustments to the airflow rates.

Pend Oreille Mine Cleanup TDF1, WA. Was the senior inspector, geo-tech inspector and site safety officer, in the cleanup of tailings disposal facility 1 (TDF1). Assisted in construction oversight during of an 18 acre tailings disposal facility, by installing a 1 foot thick cap of waste rock, non-woven geo-textile fabric liner and 1 foot thick growth media layer, as well as installing a drainage system.

Westlake Mercer Cleanup Project Phase 2 ,WA. Field Engineer responsible for 800 foot Soil Cement Bentonite (SCB) Wall and slurry trench installation oversight, as well as operating the portable nuclear density gauge. Assisted project engineer with compaction testing and SCB wall stability monitoring. Responsibilities included preparation of daily field reports, site documentation as well as field safety oversight.

Westlake Mercer Cleanup Project, Seattle, Washington. Field Engineer responsible for sheet piling, soil compaction and shoring oversight of an 8,000 cubic yard excavation, as well as working with the vibration monitors, and operating the portable nuclear density gauge. Assisted project engineer with compaction testing and design related work. Responsibilities included preparation of daily field reports, site documentation as well as field safety oversight.

IA Soil Removal at Former Gun Club, Everett, Washington. Assisted with construction oversight of an excavation project consisting of soil contaminated with lead and PAHs. Responsibilities included monitoring excavators being used on site, soil sampling, site safety officer and

AECOM

Page 3 of 3

documenting daily field activities. Assessed soil in areas of excavation for the presence of contaminants and documented excavation activities. Three excavators were used on site to remove 72,000 tons of Non-RCRA waste and 12,000 tons of RCRA waste.

Powder Mill Creek Sediment Removal IA and Creek Restoration, Everett, Washington. Responsible for construction oversight, site safety officer and environmental sampling during sediment removal and creek restoration. Intermediary between subcontractor and the client. About 300 tons of impacted sediment was removed from the creek bed prior to reconstruction work. During stream reconstruction, worked closely with project manager to ensure work was conducted according to specifications. Responsible for preparation of daily field reports of contractor work along with preparing other miscellaneous field reports

National Oceanic and Atmosphere Administration, Sha Dadx Habitat Restoration Project, Fife, Washington. Field Engineer who assisted with the construction oversight of 3500 foot long and 16 foot high levee; As well with oversight of channel construction used for salmon habitat, and installation of 10 foot diameter culvert. Acted as intermediary between the prime and sub-prime design firms during the construction phase of the project.

AECOM University
Certificate of Completion



Certificate of Completion
8 Hour HAZWOPER Refresher

This certifies that

Demetrio Cabanillas

Has completed eight hours of annual refresher training for
hazardous waste/materials workers under OSHA 29 CFR 1910.120.

Completed on 2/25/2020

Mike de Bettencourt, Director

Safety, Health and Environment Training and Development



AECOM

University Certificate of Completion

Certificate of Completion 8 Hour HAZWOPER Refresher

This certifies that

Demetrio Cabanillas

Has completed Annual HAZWOPER 8-Hour Refresher Training,
required by 29 CFR 1910.120(e) and AECOM SH&E Tier III S3NA-117-PR1,
Hazardous Waste Operations

Completed on:
03/17/2021
MM/DD/YYYY

Sue Stephens
Specialist, Safety, Health & Environment

UNITED STATES DEPARTMENT OF LABOR
OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION

Pacific Northwest OSHA Education Center, Region X
Department of Environmental and Occupational Health Sciences
University of Washington

This is to certify that

Demetrio Cabanillas

has diligently and with merit completed training in

OSHA 510 OSHA Standards for the Construction Industry

October 19, 2009 - October 22, 2009



26.0 Classroom Hours, 2.6 CEUs, ABIH #09-3382, 4.34 Safety CMs



Charles J. Shields

DIRECTOR, OSHA TRAINING INSTITUTE

Steven F. Heck

DIRECTOR, UW OSHA EDUCATION CENTER

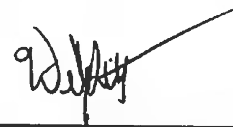
**Utah State
UNIVERSITY**

Demetrio Cabanillas

has successfully completed the training program entitled:

40-Hour OSHA 29 CFR 1910.120

Completion Date: April 30, 2003
Course No.: CEE 5670



Dr. William J. Doucette
Instructor

Certificate of Completion

This certifies that

Demetrio Cabanillas

has successfully completed

8 Hour HAZWOPER Supervisor Training

This certificate does not in itself indicate initial 24 or 40 Hour HAZWOPER Training

In Accordance With Federal OSHA Regulation 29 CFR 1910.120(e)(4)

And all State OSHA/EPA Regulations as well including 29 CFR 1926.65 for Construction.

This course is approved for 8 Contact Hours (0.8 CEUs) of continuing education per the California Department of Public Health for Registered Environmental Health Specialist (REHS) (Accreditation # 044)

Julius P. Griggs

Julius P. Griggs
Instructor #892

190412448908

Certificate Number

4/12/2019

Issue Date



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Annual Refresher Training NOT Required



Certificate of Completion

Demetrio Cabanillas

has successfully completed requirements for

Adult First Aid/CPR/AED

Date Completed: 4/6/2021

Validity Period: 2 - Years

Conducted by: LifeTek Carlson



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00JFGKS



CEU

Demetrio Cabanillas

has successfully completed requirements for

Adult First Aid/CPR/AED-BL

Date Completed: 4/6/2021

Conducted by: LifeTek Carlson

Contact Hours: 4.5
CEUs Awarded: 0.5



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Learn and be inspired at LifesavingAwards.org

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Scott J. Dietz, CSP, STSC
Environment SH&E Manager

AREAS OF EXPERTISE

SH&E Program Development and Implementation, SH&E Program and Field Auditing, SH&E Training Development and Presentation, OSHA and EPA Regulatory Compliance, Incident Investigation and Root Cause Analysis.

EDUCATION

Indiana University of Pennsylvania, B.S., Safety Sciences.

PROFESSIONAL HISTORY

AECOM, Norfolk, VA, Environmental Business Line Safety Manager, 2016 – Present.

BBSI, Salisbury, MD, Safety/Risk Manager, 2012 – 2016.

Rand Enterprises, Inc., Newport News, VA, Site Safety and Health Officer (SSHO), 2011 – 2012.

Bechtel Corporation, San Francisco, CA, Senior Environmental, Safety and Health Specialist, 2002 – 2011.

KTA-Tator, Inc., Pittsburgh, PA, Health and Safety Specialist, 1997 – 2002

REPRESENTATIVE EXPERIENCE

Mr. Dietz is a Senior Safety, Health and Environmental (SH&E) Manager with over 20 years of experience in the SH&E Profession. Mr. Dietz has a proven track record in developing and implementing SH&E programs and procedures to improve safe working conditions and reduce incidents and injuries. He conducts SH&E audits to track leading indicators and identify trends. He presents training to improve the overall SH&E hazard recognition process by creating highly effective SH&E training modules. Utilizes excellent communication skills to coach and mentor management on leading edge safety management techniques and influences all employees to take pride and ownership in the company SH&E Program.

Safety Manager/Supervisor/SSHO Experience

- **Environment Business Line SH&E Manager, AECOM, Berlin, MD.** Mr. Dietz provides SH&E support to all employees and subcontractor employees working in the AECOM Environment Business Line (EBL) and EBL client accounts including, but not limited to the Lockheed Martin Corporation, the Navy CLEAN Program and the United Technologies Corporation by assisting them in developing, writing, reviewing and implementing general and site specific SH&E policies and procedures; conducting field SH&E audits to ensure compliance with local, state and federal regulations and AECOM internal and client specific SH&E policies and procedures; works in unison with and assists the AECOM Regional and Area SH&E managers to ensure SH&E consistency with all other AECOM business lines; provides SH&E training; provides coaching and mentoring to EBL employees and provides technical support to our Lockheed Martin Corporation, United Technologies Corporation and Navy CLEAN projects, munitions projects and other government projects that fall under EM 385-1-1.
- **Safety/Risk Manager, BBSI, Salisbury, MD.** Mr. Dietz provided safety and risk management services to over 100 clients in multiple industries including: construction, manufacturing, fabrication, transportation, healthcare, etc., learned the intricacies



Scott J. Dietz, CSP, STSC
Environment SH&E Manager

Compliance Environmental International, Inc., Glen Burnie, MD, Safety Specialist, 1996 – 1997.

PROFESSIONAL CERTIFICATIONS

Certified Safety Professional (CSP), 2011.

Safety Trained Supervisor – Construction (STS-C), 2017

OSHA 500 Train-the-trainer for construction, 2015.

TRAINING

OSHA Course #3115, Fall Protection, 2016.

ASSE Risk Assessment Certificate Program, 2015

OSHA Course #500, Occupational Safety and Health Standards for Construction, 2015.

Forklift Train-the-trainer, 2012

OSHA 10-Hour Construction, 2011

OSHA 30-Hour Construction, 2011

CPR/First Aid/AED, 2009

REFERENCES:

Jim Thurston
Rand Enterprises, Inc.
Project Superintendent
Phone number: 803-309-9380

of each client company and developed strong relationships with company owners/management/supervision in order to assist them in developing, implementing and/or enhancing existing SH&E programs and procedures, worked with client owners/management/supervision on a strategic level to develop a cultural focus on the mitigation of injury and physical loss in the workplace, provided value to clients through a consultative approach, building a zero loss culture, assisted clients in developing and implementing SH&E training programs and modules.

- **SSHO, Dover Air Force Base, Design/Build Consolidated Communications Center.** Mr. Dietz succeeded in cultivating a positive safety culture on the project by coaching and mentoring management, supervision, and workers on leading edge safety and health practices (0 injuries/incidents for duration of project). Authored weekly toolbox talks and conducted weekly safety meetings for all personnel on site to foster employee participation, feedback and ownership in the project safety program. Conducted weekly, monthly and quarterly SH&E audits with contractor’s supervision and U.S. Army Corp. of Engineers (USACE) safety and health representatives and provided recommendations for mitigating field safety non-compliances. Tracked leading indicators, near misses and incident investigation and utilized this information for Lessons Learned and continuous improvement of the project safety program. Provided SH&E oversight for 12+ contractors to ensure they are in compliance with USACE EM-385-1-1. Participated in pre-construction meetings, weekly contractor coordination and progress meetings to assist in planning SH&E processes into upcoming work. Reviewed all contractors’ SH&E plans, procedures and Activity Hazard Analyses to ensure compliance with the project specifications, EM 385-1-1 and OSHA regulations, provided recommendations for improvement and submitted to USACE for approval.
- **Project Safety Supervisor for a \$2.6 Billion contract to design and build the Dulles Corridor Metrorail Project.** Mr. Dietz succeeded in improving overall safety culture for all project employees by



Scott J. Dietz, CSP, STSC
Environment SH&E Manager

Bruce Colvin
Bechtel Corporation
(Dulles Transit Partners)
Project Environmental,
Safety & Health Manager
Phone Number: 703-852-6081

Dan O'Malley
KTA-Tator, Inc.
EH&S Manager
Phone Number: 412-788-1300

being on site prior to the start of construction to review/revise existing SH&E programs and write and implement new procedures for Drugs and Alcohol and Emergency Response. Controlled hazards for falls, confined spaces, excavations and trenching, scaffolds, ladders, cranes and rigging, electrical equipment and housekeeping by implementing site-specific safety procedures. Cultivated better planning of safety into daily work operations by leading the implementation of the STARRT (Safety Task Analysis Risk Reduction Talks) Process and the Job Hazard Analysis Program. Increased employee participation/involvement in the Project SH&E Program by instituting a Behavior Based Safety Program and launching an employee safety recognition program. Enhanced employee awareness of hazard recognition and control of hazards by presenting SH&E training and updating existing SH&E training programs to meet site-specific needs. Authored weekly Toolbox Talks and conducted weekly supervisors' safety meetings to support on-the-job field safety training. Collected and tracked all SH&E audit and investigation data to use for Lessons Learned and additional training materials. Monitored daily maintenance of traffic operations to ensure all employees are protected from vehicular traffic.

- **Project Safety Manager for the modernization of the Keystone Cement Plant, Keystone Cement Company, Bath, PA.** The project consisted of replacing its two wet-process kilns with a single dry preheater-precalciner kiln. It also involves building a 360' high concrete tower using a slip form. Mr. Dietz provided SH&E oversight to approximately 15 contractors to make sure they were in compliance with OSHA, MSHA and Keystone Cement Company SH&E regulations and specifications. Reviewed all contractor's work plans, drawings and Job Hazard Analyses to ensure compliance with the project specifications and provided recommendations for improvement. Attended pre-construction meetings with contractors and the project management team to assist in planning SH&E processes into the work. Gained valuable experience working with the Mine Safety and Health Administration (MSHA) and conducting MSHA SH&E audits.

Scott J. Dietz, CSP, STSC
Environment SH&E Manager

- **SH&E Manager for the modernizing and expanding the existing Iron Ore Mine for the Iron Ore Company of Canada (IOC) in Labrador City, Newfoundland, CA.** Mr. Dietz provided SH&E oversight to approximately 20 contractors to confirm they were in compliance with IOC and Provincial safety and health procedures and regulations. Performed weekly, monthly and quarterly SH&E audits with each contractor's supervision and safety representatives and provided recommendations for correcting/alleviating field safety non-compliances. Reviewed contractor SH&E Plans and Procedures and provided written recommendations for improvement. Served as liaison between IOC and contractor on safety concerns to help foster a team atmosphere. Participated in weekly contractor coordination, progress and safety meetings to assist in planning SH&E processes into upcoming work.
- **Senior SH&E Specialist, San Onofre Nuclear Generating Station, San Onofre, CA.** Performed a maintenance outage on 2 nuclear reactors at San Onofre Nuclear Generating Station. Mr. Dietz confirmed worker compliance with regulations, policies and procedures set forth by Bechtel, Southern California Edison and Cal-OSHA by providing night time safety coverage and performing daily site safety inspections. Provided basic first aid to craft for minor injuries and illnesses. Chaired weekly supervisor safety meetings to increase awareness of hazard recognition and provided teaching and mentoring to craft and supervisors on safety related issues.
- **Project Safety Manager for a \$450 Million contract with Port Authority of NY and NJ for rebuilding Jamaica Station in Queens, NY.** The project entailed constructing an 8 story building for the Light Rail from JFK International Airport to connect with the Long Island Railroad (LIRR) and the New York Subway System. The existing LIRR platforms were demolished and rebuilt and the Subway Station was redesigned and upgraded. All of this work was completed as the train services continued to operate. Mr. Dietz acted as the owner's representative on all SH&E related issues. Performed daily Site Safety

Scott J. Dietz, CSP, STSC
Environment SH&E Manager

duties and communicated findings to the General Contractor. Assisted in planning work around track outages to ensure public safety. Performed incident/accident investigation to identify root causes and extract information for lessons learned. Chaired weekly safety meetings with owner's risk management staff, insurance carriers, Long Island Rail Road representatives, and Mass Transit Authority (MTA) representatives to maintain consistency and promote a team atmosphere amongst the entities involved.

- **Safety and Health Specialist for building a facility for the Aberdeen Proving Ground (USACE) to neutralize and remove 1,700 tons of mustard agent.** Mr. Dietz provided emergency medical response for field operations. Assisted in the development and implementation of a near miss program to extrapolate information for lessons learned and weekly Toolbox talks. Monitored environmental hazards such as confined space, heat, cold, noise and severe weather and recommended corrective actions to field supervision and craft. Participated in weekly, monthly and quarterly SH&E audits with the U.S. Army Corp. of Engineers.
- **Safety Services Support Supervisor to add upgrades to existing cell site towers and building new towers.** Mr. Dietz provided support to the Telecommunications GBU SH&E Management Team by reviewing and revising existing programs and procedures (e.g. Fall Protection, Confined Space and Aerial Lifts). Wrote and implemented new programs and procedures (e.g. Safe Driving Program, Hand Protection and the Safety Absolutes Program) that proved to be instrumental in reducing injuries and accidents. Supported field safety by writing and reviewing weekly Toolbox topics to enhance field employees' knowledge of safety hazards. Assisted in the implementation of and compliance with the annual GBU Strategic Plan. Conducted Market SH&E audits and contractor readiness reviews to provide contractors with a better understanding of how to manage SH&E issues.
- **Safety and Health Field Specialist, KTA-Tator, Inc.,**

Scott J. Dietz, CSP, STSC
Environment SH&E Manager

Pittsburgh, PA. Mr. Dietz provided Industrial Hygiene and Safety consulting services for the Maryland State Highway Bridge Department. The scope of the contract was to monitor compliance with OSHA, EPA, MOSH and COMAR regulations while contractors were removing existing coatings and re-painting bridges, he also ensured the general public and contractor employees were protected from safety and environmental hazards by performing field audits of contractor safety and health practices and procedures. Many of these bridges were over AMTRAK and CSX railroads, so Mr. Dietz had the responsibility to ensure all contractors were following rail safety requirements as well. He verified employee exposures to lead dust were below the Permissible Exposure Limit and/or Action Level by collecting worker exposure samples and interpreting the results for the employees. Reviewed and audited contractors' Safety and Health Plans and Environmental Monitoring Plans for compliance with Maryland State Highway Specifications. Authored reports to client detailing hazard assessments, worker protection and project activities and recommended corrective actions.

- **Safety Specialist, Compliance Environmental International, Inc., Glen Burnie, MD.** Mr. Dietz authored and implemented company SH&E programs and procedures to assist in reducing risk and injury. Performed air monitoring for lead and asbestos, read and analyzed results. Performed confined space monitoring for client employees and documented results. Performed safety audits and inspections, provided findings and results to company clients and recommended corrective actions. Assisted in performing lead and asbestos surveys.

Board of Certified Safety Professionals

Upon the recommendation of the
Board of Certified Safety Professionals,
by virtue of the authority vested in it,
has conferred on

Scott J Dietz

the credential of


Certified Safety Professional

and has granted the title as evidence of meeting the qualifications and passing
the required examination so long as this credential is not suspended or
revoked and is renewed annually and meets all recertification requirements.



December 19, 2011
DATE ISSUED

22750
CERTIFICATION NUMBER


BOARD PRESIDENT SIGNATURE


BOARD SECRETARY SIGNATURE

United States Department of Labor
Mid Atlantic OTI Education Center

This is to certify that on
May 11-14, 2015

SCOTT J DIETZ

Diligently and with merit completed training in

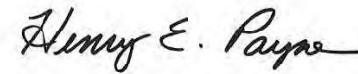
OSHA COURSE #500

Trainer Course in Occupational Safety & Health Standards for the Construction Industry

26 Contact Hours



Rod Markley
Program Director, Mid Atlantic OTI Education Center



Henry E. Payne, PhD
Director, Directorate of Training and Education



**MID-ATLANTIC OSHA TRAINING
INSTITUTE EDUCATION CENTER**



Anthony Palmieri, RG, LG, LHG

Project Manager/Senior Hydrogeologist

PROFESSIONAL HISTORY

Education

BS, Geology, West Virginia University, 2007

Professional Registrations

Licensed Geologist and Hydrogeologist, Washington
Registered Geologist, Oregon

Professional Affiliations

Association of Environmental and Engineering Geologists

Training and Certifications

OSHA 40-Hour HAZWOPER Training
OSHA 8-Hour HAZWOPER Refresher Training
OSHA 30-Hour Construction Industry Training
OSHA 8-Hour HAZWOPER Supervisor Training
First Aid and CPR Certified

Years of Experience

With AECOM: 13
Other Firms: 0

Mr. Palmieri has 13 years of experience in managing, conducting, and serving as technical lead on remedial investigations, feasibility studies, remedial alternative evaluation, and remedial actions. He is well versed with CERCLA regulations and has managed and led field investigations at many federal installations and commercial facilities across the U.S. His experience includes project management, design and installation of groundwater monitoring, recovery, vapor extraction, oxidant injection, and air-sparging wells, UFP QAPP development and implementation, aquifer performance testing, slug testing and soil gas surveys with data analysis for each testing category. Experience with remedial technologies include in-situ chemical oxidation, dual-phase extraction, air sparge/soil vapor extraction, enhanced bioremediation, and permeable reactive barriers. He has experience with PFASs, petroleum hydrocarbons, VOCs, SVOCs, 1,4-dioxane, PCBs, dioxins, and metals.

EXPERIENCE

US Army Corps of Engineers – Baltimore District Army National Guard PFASPA/SI Program

Multiple Sites, Nationwide

Role: Senior Lead (2019-present)

AECOM is executing the Army National Guard's (ARNG's) nationwide PA/SI PFAS program, currently finalizing PAs at 185 facilities in every state and territory (Guam, Virgin Islands, and Puerto Ric) of the United States. The PA objective was to identify PFAS release areas and assess the likelihood of a potentially complete drinking water PFAS exposure. Using our extensive resource network, AECOM

completed 182 site visits, with visual site inspections (VSIs), within 26 months of award and accommodating our client and State ARNG resources. As the PAs neared completion, AECOM supported ARNG IED in prioritizing all of the identified AOIs for further investigation using a project-specific scoring system. The Prioritization Score evaluated whether a PFAS release was confirmed or suspected, size and duration of potential PFAS releases, certainty about those releases, whether a known drinking water impact existed, proximity to drinking water that may not have been tested, and receptor characteristics (e.g., size of affected population, potential for food exposure). Such prioritization occurred from PA initiation, so some SIs began before PA Reports were completed at several sites, due to the urgency needed to protect human health and the environment. SIs have been awarded for 75 sites, with a contract capacity for 100. The SI has several objectives, based on evolving Federal and State regulations and DOD policy as the scientific community's understanding of PFAS in the environment improves. First, in accordance with CERCLA, the objective of each SI is to confirm the presence or absence of PFAS in soil, groundwater, surface water, and sediment at each AOI. Because of the importance of protecting drinking water, the SI also evaluates groundwater PFAS concentrations on the facility and at the facility boundary nearest drinking water receptors. Finally, in accordance with DOD policy released in October 2019, both groundwater with the potential as drinking water and soil concentrations for PFOS, PFOA, and PFBS are compared against DOD Risk-based Screening Values; wherever concentration of any one compound in any environmental medium exceed the Screening Values, the site proceeds to the next phase: Remedial Investigation. Support AECOM PM in implementing SI tasks/procedures. As a program senior lead, responsibilities include disseminating programmatic information from the Project Manager to SI Task Managers and serving as lead verifier for SI documents, including UFP-QAPPs and SI reports.

U.S. Army Corp of Engineers – Omaha District Hamilton Labree Superfund Site, OU-1 Interim Remedy Chehalis, WA

Role: Design Geologist/Hydrogeologist (2019-present)

Project hydrogeologist support for In-Situ Thermal Remediation (ISTR) of source area tetrachloroethene (PCE) impacts to 47 feet below ground surface, within a 14,000-square-foot area, at the location of the Berwick Creek fish habitat. Remedy components in addition to ISTR include creek management and Enhanced Anaerobic Bioremediation (EAB). Heat will be injected into the subsurface to volatilize contaminants which will be captured and treated. An approximate 400 cubic feet per minute vapor

Anthony Palmieri, RG, LG, LHG

Project Manager/Senior Hydrogeologist

stream and 20 gallon per minute liquid stream will be extracted from the heated source area and treated prior to discharge. Duties include design of remedial and performance monitoring wells, technical oversight with the installation of those wells, designing and overseeing the implementation of aquifer performance tests, and technical oversight of logging of geologic media. The Draft Remedial Action Work Plan (RAWP) for remedy implementation was submitted February 2020. ISTR system construction is scheduled to begin mid-2020 and implementation is scheduled to be completed mid-2021.

US Army Corps of Engineers – Seattle District Joint Base Lewis-McChord PFASPA/SI Lakewood, Washington (2017-2020)

Role: Project Hydrogeologist/ Deputy Project Manager
Project hydrogeologist and deputy PM for a PA/SI specific to PFAS. The Project was awarded under USACE Seattle Contract W912DQ15D-3011 (\$700K). As the project progressed, USACE wanted to expand the scope. However, the originating contract was at capacity, so a modification was not possible. The additional scope was added under Contract W912DW18D1014 (\$633K). AECOM performed a three-phase PA/SI for PFAS impacts in groundwater at this multi-site combined Army/Air Force installation. AECOM was selected by the USACE to lead this effort based on our extensive PFOS/PFOA qualifications. We conducted historical research, completed a dozen interviews, and performed site visits to identify > 50 potential PFAS sources areas across this 450-square mile installation. Using this information, AECOM prioritized potential source areas and developed a Phase I QAPP. Based on Phase I results, a QAP for Phases II and III was prepared. This complex project required work in and around active construction sites and operating areas, such as the McChord and Grey Army airfields. In addition, the CSM is complex due to Pleistocene-age glacial deposits that form a stacked system of five aquifers separated by confining units. Throughout the phases of the project, AECOM provided significant community involvement. AECOM prepared presentations for and led 5 Technical Project Planning meetings with > 20 attendees each comprising JBLM, Army Environmental Command, USACE, EPA, Washington Department of Ecology, Washington Department of Health, legislative representatives, and six local water district representatives. We successfully achieved consensus on approaches, methods, and sampling locations for the phased approach to sampling with minimal comments on planning documents. We conducted historical research, completed a dozen interviews, and performed site visits to identify potential PFAS sources at JBLM. Using this information, AECOM prioritized potential source areas and developed a sampling

and analysis plan and QAPP to conduct a phased sampling approach for PFOS/PFOA sources identification. Phase I comprised sampling groundwater from 50 existing wells and one surface water location; Phase II included installation and sampling of 12 wells up to 50 feet deep and sampling an additional 20 existing. Phase III comprised installation and sampling of 7 wells with depths between 200-300 feet. We worked with Brice under our small-business joint venture for the Phase III activities. We also performed composite PFAS sampling on the drill cuttings for future disposal characterization. IDW water was transported off-site for disposal. We minimized the potential for data quality concerns by ensuring that all field team members received AECOM's PFAS sampling training. We also collected and analyzed a sample of well water used by the drillers for well installation and decontamination water to ensure that only PFAS-free water was being brought on to the site. The results were compared to the 70 ppt EPA health advisory level (HAL) for PFOS and PFOA. Given the fluid regulatory climate relative to PFAS, the 6 UCMR-3 compounds results were summed and also compared to the 70 ppt EPA HAL. The results were also screened against the recent EPA and DoD screening level of 40 ppt for PFOS or PFOA. Field work was completed May 2019 and the final report was submitted in April 2020

US Army Corps of Engineers – Omaha District, Moses Lake Wellfield Contamination Superfund Site, Moses Lake, Washington (2019)

Role: Technical Lead/Hydrogeologist

Responsible for designing and managing the installation of six deep monitoring wells installed in fractured bedrock formation. Additional responsibilities also included developing a rehabilitation program for fouled/damaged existing onsite extraction wells.

US Coast Guard – Pier 36 Sediment Investigation, Base Seattle, WA (2018-present).

Role: Deputy Project Manager/Technical Lead

Responsibilities included project management, writing the QAPP, and planning and implementing a large field investigation focused on sediment characterization within the East Waterway Superfund Site. This included direct interaction with federal stakeholders including EPA Region X.

NAVFAC NW, Treatment System Optimization, Focused Feasibility, Proposed Plan, ROD Amendment, Area 6, Naval Air Station Whidbey Island, Oak Harbor, WA (2014-Present)

Role: Field Lead/Project Hydrogeologist

Responsible for overseeing and implementing the field activities to completely reconfigure the remedy at a site with an existing, large-scale pump and treat system designed for chlorinated solvents in groundwater to also address 1,4-

Anthony Palmieri, RG, LG, LHG

Project Manager/Senior Hydrogeologist

dioxane. Mr. Palmieri planned and oversaw execution of additional source area evaluation including drilling oversight, soil sampling, and vapor probe installation, which included direct interaction with the NAVFAC NW RPM and other NAVFAC NW personnel.

NAVFAC NW, OU-1, JP-09 Site Recharacterization Program, Naval Base Kitsap Keyport, Keyport, WA (2015-2016)

Role: Field Lead/Project Hydrogeologist

Responsible for overseeing and implementing the field activities for a large subsurface investigation. The program focused on identifying and delineating TCE source areas using membrane interface probe (MIP) direct imaging technology. Responsibilities included writing the QAPP, and planning and implementing the field investigation. This included direct interaction with project stakeholders including NAVFACNW, the WA Department of Ecology and the Squamish Tribe.

NAVFAC NW, Area 6, Insitu Oxidization Pilot Study, Naval Air Station Whidbey Island, Oak Harbor, WA (2014)

Role: Field Lead/Project Hydrogeologist

Responsible for overseeing and implementing the field activities for an in situ treatability study. The study focused on testing two in situ treatment technologies on a large, dilute 1,4-dioxane and vinyl chloride plume that has higher concentrations of TCE and 1,1,1-TCA in a smaller portion of the plume. Responsibilities included planning and implementing the field investigation which consisted of soil sampling, installing injection wells and monitoring wells, soil sampling, and injection oversight. This included direct interaction with the NAVFACNW RPM and other NAVFAC NW personnel.

NAVFAC NW, Bangor OU-8 Vapor Intrusion Investigation, Naval Base Kitsap Bangor, Silverdale, WA (2013)

Role: Field Lead/Project Geologist

Responsible for planning and executing a vapor intrusion investigation within an occupied building impacted by a gasoline release from and underground storage tank (UST). Responsibilities included installing subsurface vapor probes, collecting subsurface vapor and indoor air samples, and updating the conceptual site model.

Confidential Manufacturing Client, EPA Region 7 Superfund Site, Nebraska (2010 to present)

Role: Project Hydrogeologist

Project geologist for supplemental investigations and remedial action associated with chlorinated solvents in groundwater at a CERCLA site at an operational manufacturing facility. Office tasks include writing QAPPs, schedules, and budgets for large-scale field investigations; reviewing and interpreting hydrogeologic and geochemical data; remedial extraction well design and optimization; and

technical reporting. Field tasks include oversight of drilling programs and conducting aquifer testing.

The Boeing Company, Upland RI/FS, Everett, WA (2010-present).

Role: Project Hydrogeologist

Responsible for conducting/overseeing field investigations as part of the upland RI that included subsurface groundwater/soil investigations, aquifer testing, storm/surface water and sediment sampling, and indoor/subslab air sampling. Mr. Palmieri was the primary author on many of the RI Workplans and was a significant contributor to the Upland RI Report. He currently serves as the AECOM geology/hydrogeology technical lead under the existing contract.

Teck America, Upper Columbia River Remedial Investigation, Washington (2012-present)

Role: Project/Field Geologist

Field geologist for multiple phases of work collecting surface water, sediment, and upland soil samples on a Superfund site; ~\$4M effort. Lead field sampling teams and assisted with developing project QAPPs, schedules, and budgets.

US Postal Service, Multiple Sites, Washington (2011-present)

Role: Project Manager/Hydrogeologist

Responsible for managing site investigations, feasibility studies, UST site assessments and closures, and remedial design and implementation at multiple USPS fueling and maintenance facilities in Washington.

US Army, Trap and Skeet Remedial Investigation - Military Munitions Response Program, Maryland (2009)

Role: Field Lead/Project Geologist

Led a team of junior level geologists in conducting soil sampling of a former trap and skeet range aimed at determining the ecological impact of lead shot. Collected soil samples in the field, removed aliquots for laboratory analysis, and used a wet sieve process to separate lead shot from the soil mineral fraction. Also responsible for enforcing the strict health and safety requirements on a site containing unexploded ordinance. After the culmination of field activities, aided with data assessment and technical report writing.

US Air Force, Vapor Intrusion Assessment - Oak Ridge National Laboratory Contract, Delaware (2007-2008)

Role: Field Geologist

Planned and conducted indoor air sampling activities at buildings located above chlorinated solvent plumes. Activities included sample location designation based on building structure and design, field sampling, data assessment, and report writing including human health risk screening.

US Army, Small Arms Range Site Investigation - Military Munitions Response Program, Mississippi (2008)

Role: Field Geologist

Anthony Palmieri, RG, LG, LHG

Project Manager/Senior Hydrogeologist

Conducted a site investigation of a small arms range including sampling location designation, collecting soil samples for lead and explosives analysis, and technical report writing. Also responsible for enforcing the strict health and safety requirements for work on a site containing unexploded ordinance.



ALL AMERICAN ENVIRONMENTAL SERVICES, INC.

This is to certify that

ANTHONY D. PALMIERI

has successfully completed

**“HAZARDOUS WASTE SITE WORKER” 40-HOUR COURSE
SATISFYING OSHA 29 CFR 1910.120 (e) (3) (i)**

at

**ALL AMERICAN SCHOOL OF OCCUPATIONAL SAFETY AND HEALTH
COLUMBIA, MARYLAND**

A handwritten signature in blue ink, reading "Thomas C. Cusick". The signature is written in a cursive style and is positioned above a horizontal line.

School Director

**September 10-14, 2007
40S-0709A**



AECOM

University Certificate of Completion

Certificate of Completion 8 Hour HAZWOPER Refresher

This certifies that

Anthony Palmieri

Has completed Annual HAZWOPER 8-Hour Refresher Training,
required by 29 CFR 1910.120(e) and AECOM SH&E Tier III S3NA-117-PR1,
Hazardous Waste Operations

Completed on:
06/02/2021
MM/DD/YYYY

Sue Stephens
Specialist, Safety, Health & Environment



AECOM

University Certificate of Completion

This is to certify that
Anthony Palmieri

Has successfully completed the following course
Hazwoper Supervisor, 8 hour

Completed on:
07/05/2013
MM/DD/YYYY



Sue Stephens
Specialist, Safety, Health & Environment



36-600718545

This card acknowledges that the recipient has successfully completed a
30-hour Occupational Safety and Health Training Course in
Construction Safety and Health

Anthony Palmieri

RICK GLEASON, CIH, CSP

9/3/2010

(Trainer name – print or type)

(Course end date)



Certificate of Completion

anthony palmieri

has successfully completed requirements for

Adult and Pediatric First Aid/CPR/AED

Date Completed: 5/21/2021

Validity Period: 2 - Years

Conducted by: American Red Cross



To verify certificate, scan code or visit redcross.org/digitalcertificate and enter ID.

Learn and be inspired at LifesavingAwards.org



00KRHRE



American Red Cross
Training Services

CEU

anthony palmieri

has successfully completed requirements for

Adult and Pediatric First Aid/CPR/AED-BL

Date Completed: 5/21/2021

Conducted by: American Red Cross

Contact Hours: 5.0
CEUs Awarded: 0.5



To verify certificate, scan code or visit redcross.org/digitalcertificate and enter ID.

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Page: 2
Palmieri, Anthony
Today's Date: 10/16/2020
Exam Date: 10/06/2020
Exper. Date: 10/06/2021
Record #: S1859624522

300 S. Harbor Blvd., Suite 600, Anaheim, CA 92805
Ph: (800) 455-6155 Fax: (714) 456 2154

In addition to the results, the following are additional comments regarding your medical examination. You should share this information with your personal physician:

Routine follow up care.

As a result of the above medical conditions, the following work status and restrictions are being recommended to your employer:

NO WORK RESTRICTIONS

I appreciate the opportunity to review your examination for AECOM. If you have any questions now or in the future, please feel free to call me at (800) 455-6155.

Sincerely,

WorkCare Physician

WorkCare MD

If you would like further information on the laboratory tests and a general explanation of test results, please visit our web site at <http://www.workcare.com>. Click on "Knowledge Center/Resources" and use the "Health Fact Sheets" link to access this information.

Appendix D: Site Safety and Health Plan

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FINAL
23 JUNE 2021

Site Safety and Health Plan Supplemental Remedial Investigation

Keyport Operable Unit 2, Area 8
Naval Base Kitsap
Keyport, Washington

Department of the Navy
Naval Facilities Engineering Systems Command
Engineering Field Activity, Northwest
1101 Tautog Circle
Silverdale, WA 98315-1101



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**Department of the Navy
Naval Facilities Engineering Systems Command Northwest**

**Final
Site Safety and Health Plan
Supplemental Remedial
Investigation
Keyport Operable Unit 2, Area 8
NAVAL BASE KITSAP KEYPORT, WA**

June 2021

Prepared for NAVFAC Northwest by
AECOM Technical Services, Inc.
1111 3rd Avenue, Suite 1600
Seattle, WA 98101

N62742-17-D-1800
CTO N442550F4176

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CONTENTS

Acronyms and Abbreviations	vii
1. Introduction	1
2. Site Hazard and Risk Analysis	1
2.1 Site Description and Characteristics	1
2.2 Site Hazards	1
2.2.1 Chemical Hazards	1
2.2.2 Physical Hazards	5
2.2.3 Biological Hazards	9
2.2.4 Immediately Dangerous Hazards to Life and Health	11
2.2.5 Ionizing Radiation Hazards	11
2.2.6 Non-ionization Radiation Hazards	12
2.3 Site Risks	12
2.3.1 Hazardous Substances and Other Health Hazards	12
3. Activity Hazard Analysis	12
3.1 Major Tasks and Activity Hazard Analysis	12
3.2 AHA Review	13
3.3 AHA Modification	13
3.3.1 AHA Acceptance	14
3.3.2 AHA Accessibility	14
4. Staff Organization, Qualifications, and Responsibilities	14
5. Training	14
6. Personal Protective Equipment	14
7. Medical Surveillance	16
7.1 Initial and Periodic Medical Testing and Certification	16
7.2 Supplemental Examination	17
7.3 Health Care Administrative Services	17
8. Exposure Monitoring	17
8.1 Monitoring Instrumentation	17
8.2 Monitoring Procedures and Action Levels	18
8.3 Exposure Monitoring Training	19
8.4 Determination of Hazard	19
9. Heat and Cold Stress	19
9.1 Heat Stress Monitoring	19
9.1.1 Heat Stress Controls	20
9.2 Cold Stress Monitoring	22
9.3 Other Weather-Related Hazards	24
10. Site Control Measures/Standard Operating Procedures	24
10.1 Site Control Plan	24
10.1.1 Site Control	24
10.1.2 Work Area Control Records	26
10.1.3 Site Access	26

<i>June 2021</i>	<i>Final SSHP Remedial Investigation Keyport OU 2, Area 8 Naval Base Kitsap, Keyport, WA</i>	<i>Contents</i>
	10.1.4 Theft	26
	10.1.5 Personal Confrontation	26
	10.1.6 Buddy System	26
	10.1.7 Site Communications	26
	10.1.8 Medical Assistance	26
	10.1.9 Pre-Entry Briefing	26
	10.1.10 Site Rules and Prohibitions	26
	10.1.11 Work Permits	29
	10.1.12 Material Handling Procedures	29
	10.1.13 Treatment Technology Employed at Site	29
	10.1.14 Motor Vehicle Safety Plan	29
	10.2 Sanitation Plan	30
	10.3 Spill Containment Plan	30
	10.3.1 Measures for Preventing Fuel Spills	30
	10.3.2 Fuel Spills Greater than Five Gallons	31
	10.3.3 Notification	31
11.	Decontamination	31
	11.1 Decontamination Equipment	32
	11.2 PPE Doffing and Donning Information	32
	11.3 Equipment Decontamination	33
	11.4 Personal Decontamination Procedures	33
	11.4.1 Disposal of Decontamination Wastes	35
	11.4.2 Monitoring Decontamination Effectiveness	35
12.	Emergency Equipment and First Aid	35
	12.1 Emergency Equipment	35
	12.2 First Aid	35
	12.2.1 First Aid Kits	35
	12.2.2 Bloodborne Pathogens	36
13.	Emergency Planning	36
14.	Pre-Entry Briefing	37
15.	Confined Space Entry and Site Excavations	37
	15.1 Confined Space Entry	37
	15.2 Site Excavations	37
16.	References	38
 ATTACHMENTS		
A	Safety Data Sheets (included in field copy; excluded from reviewer copy)	
 FIGURES		
1	Example Site Layout	27

June 2021 *Final SSHP Remedial Investigation* *Contents*
Keyport OU 2, Area 8 Naval Base Kitsap, Keyport, WA

TABLES

1	Hazardous or Toxic Agent Inventory	2
2	Summary of Contaminant Exposure Hazards	3
3	Minimum Level of Protection Requirements	15
4	Monitoring Instrumentation	18
5	Monitoring Procedures and Action Levels for Intrusive Activities	18
6	Heat Stress Exposure TLV and Action Limits	20
7	Cold Stress Monitoring	23
8	Emergency Equipment	35

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ACRONYMS AND ABBREVIATIONS

°F	Fahrenheit
AECOM	AECOM Technical Services, Inc.
AHA	activity hazard analysis
ANSI	American National Standards Institute
APP	accident prevention plan
CFR	Code of Federal Regulations
COPC	chemical of potential concern
CRZ	contamination reduction zone
CTO	contract task order
dBA	decibel (A-weighted scale)
DOT	Department of Transportation, United States
EC	emergency action coordinator
EZ	exclusion zone
EM	Engineering Manual
FM	field manager
HAZWOPER	hazardous waste operations and emergency response
IDW	investigation-derived waste
MEDEVAC	medical evacuation
Navy	Department of the Navy, United States
OSHA	Occupational Safety and Health Administration
OU	operable unit
PAH	polynuclear aromatic hydrocarbon
PFD	personal floatation device
PID	photoionization detector
PPE	personal protective equipment
RPM	remedial project manager
SDS	Safety Data Sheet
SH&E	safety, health, and environment
SHM	safety and health manager
SOP	standard operating procedure
SSHO	site safety and health officer
SSHPP	site safety and health plan
TDG	Transportation of Dangerous Goods
TLV	threshold limit value
TPH	total petroleum hydrocarbons
TPH-d	total petroleum hydrocarbons-diesel range organics
TPH-o	total petroleum hydrocarbons-residual range organics
U.S.	United States
VOC	volatile organic compound
WBGT	wet bulb globe thermometer

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1. Introduction

This project meets the hazardous waste operations and emergency response (HAZWOPER) applicability requirements defined in 29 Code of Federal Regulations (CFR) 1910.120(b) and 1926.65(a)(1)(i) through (a)(1)(v); and Engineering Manual (EM) 385-1-1 Section 33.A.01.

This Site Safety and Health Plan (SSHP) is an appendix to the Accident Prevention Plan (APP). Therefore, information presented in the APP is not duplicated in the SSHP. Rather, the SSHP addresses elements that are specific to the project site, not covered in the APP, and may have the potential for negative effects on the health and safety of workers.

Changes and modifications to this SSHP must be in writing with knowledge and concurrence of the local safety and health manager (SHM) and accepted by Naval Facilities Engineering Systems Command, Northwest.

The site has not been fully characterized and there is potential for employee related exposures during the tasks to be performed. Therefore, this project does not meet the criteria for an abbreviated APP and an SSHP is required.

This SSHP was developed in accordance with 29 CFR 1910.120 and 1926.65; EM 385-1-1 Sections 33.A, B; and the AECOM Technical Services, Inc. (AECOM) Environmental Health and Safety Program. AECOM has an extensive Environmental Health and Safety Program in place that is reviewed and updated annually to ensure that it remains current with regulatory requirements. Where requirements vary, the most stringent requirements will apply.

2. Site Hazard and Risk Analysis

2.1 SITE DESCRIPTION AND CHARACTERISTICS

General information regarding this site (including site location, description, and characterization) is presented in APP Section b.4.a.

2.2 SITE HAZARDS

For this project, AECOM will perform tasks associated with the remedial investigation at Naval Base Kitsap (NBK) Keyport Operable Unit (OU) 2 Area 8. Project tasks include: field investigation including a geophysical survey, well installation, soil and groundwater sample collection, depth to water and saltwater wedge monitoring, and a horizontal and vertical survey of all new sample collection locations.

Performance of these tasks can expose personnel to a variety of hazards due to the operational activities, physical conditions of the work locations, and potential presence of environmental contaminants. AECOM will conduct an activity hazard analysis (AHA) for each work activity. Each AHA will account for chemical, physical, biological, and ionizing radiation hazards likely to be encountered while performing the work. The following sections outline hazards and describe the requirements and guidelines to provide a safe working environment during operations.

2.2.1 Chemical Hazards

The following chemical hazards have been identified for the proposed field activities. Detailed chemical AHA forms are included in Appendix A of the APP.

2.2.1.1 *COMMERCIAL CHEMICALS*

Commercially available chemicals that may pose a hazard and are expected to be used during the performance of project activities are presented in Table 1.

Table 1: Hazardous or Toxic Agent Inventory

Agent	Amounts	Uses
Alconox	8 ounces	Decontamination solution
Bentonite	10 × 50 lb bags	Monitoring well installation
Buffer solutions (pH 4, 7, and 10)	3 × 475 mL bottles	Water quality meter calibration
Cement	10 × 94 lb bags	Monitoring well installation
Gasoline	15 gallons	Vehicle and Equipment fuel
Hand sanitizer	8 ounces	Cleaning hands
Hand sanitizer wipes	100 wipes	Cleaning hands and face
Hydrochloric Acid	20 × 1-mL volumes	Preservation solution for samples
Insect repellent	20 ounces	Repel mosquitos
Insecticide	20 ounces	Kill wasps and dangerous insects
Isobutylene (100 ppm)	1 liter (1 canister)	PID calibration gas
Isopropyl alcohol	16 ounces	Decontamination solution
Methanol	20 mL	Sample preservative
Nitric Acid	20 × 1-mL volumes	Preservation solution for samples
Nitrogen	3 × cylinders	Sampling tool
Paint pen	2 pens	Writing implement
Sharpie pen	2 pens	Writing implement
Spray paint	1 can of spray paint	Mark ground cover
Sulfuric Acid	20 × 1-mL volumes	Preservation solution for samples
Sunscreen	8 ounces	Sun protection for skin

- % percent
- CO carbon monoxide
- H₂S hydrogen sulfide
- lb pound
- mL milliliter
- O₂ oxygen gas
- ppm part per million
- PID photoionization detector

Sampling materials for calibration will be stored either in sampling coolers or separate containers. The inventory and location of hazardous or toxic materials will be updated frequently as necessary to ensure accuracy. All hazardous or toxic materials will be properly labeled on their containers with distinct wording and symbols indicating the physical and health hazards associated with them.

In accordance with the requirements of Safety, Health, and Environment (SH&E) Standard Operating Procedure (SOP) S3AM-115-PR1, *Hazardous Materials Communication*, all personnel shall be briefed on the hazards of the chemical products used (e.g., isopropyl alcohol for decontamination), and shall be aware of and have access to all Safety Data Sheets (SDSs) (Attachment A). Each SDS includes information on specific safety and health protection procedures, use, storage, and disposal as well as information on appropriate fire-fighting measures and accidental release measures.

For locally obtained products, SDSs may not be available, in which case some alternate form of product hazard documentation can be used. A copy of the item’s SDS must be provided to the site

safety and health officer (SSHO) for approval and filing. The SSHO will maintain copies of all SDSs on site in the project field box, and SDSs will be readily available to employees.

2.2.1.2 CHEMICALS OF POTENTIAL CONCERN

The information presented below is intended to inform site personnel about the expected hazards associated with known or suspected environmental contaminants at the project site.

Based on analytical results from samples collected during previous investigations, the chemicals of potential concern (COPCs) remaining at the site may include total petroleum hydrocarbons (TPH) quantitated as diesel range organics (TPH-d) and as residual range organics (TPH-o), and polynuclear aromatic hydrocarbons (PAHs). Therefore, these COPCs are considered the occupational COPCs for the site and are discussed in further detail in the following sections. Environmental contaminants that may potentially pose an occupational hazard (i.e., volatile organic compounds [VOCs]) are also listed in Table 2.

Table 2: Summary of Contaminant Exposure Hazards

Chemical Name	Maximum Concentration Found on Site	Medium	Location	Primary Route of Exposure ^a	PEL	TLV	IP Electron Volts
Acenaphthene	9.38 mg/kg	Soil	Former AST Area	Inhalation	N/A	N/A	N/A
Benzene	1.3 µg/L	GW	Former AST Area	Inhalation	1 ppm	0.5 ppm	9.25
Benzo(a)pyrene	0.28 mg/kg	Soil	Former AST Area	Inhalation	0.2 mg/m ³	0.2 mg/m ³	N/A
Cadmium	4,380 mg/kg	GW/Soil	Former Building █	Inhalation	5 µg/m ³	0.01 mg/m ³	N/A
Chromium	1,620 mg/kg	GW/Soil	Former Building █	Ingestion	0.5 mg/m ³	0.5 mg/m ³	N/A
Diesel fuel (TPH-d)	2,500 µg/L	GW	OWDFMW01	Inhalation	N/A	15 ppm	N/A
Diesel fuel (TPH-d)	11,000 mg/kg	Soil	Former AST Area	Inhalation	N/A	15 ppm	N/A
Residual fuel (TPH-o)	8,300 mg/kg	Soil	UDA	Inhalation	5 mg/m ³ ^b	5 mg/m ³ ^b	N/A
Naphthalene	0.12 J µg/L	GW	Former AST Area	Inhalation	10 ppm	10 ppm	8.12
TCE	1,660 µg/L	GW	Former Building █	Inhalation	100 ppm	10 ppm	9.45
Toluene	0.21 µg/L	GW	OWDFMW01	Inhalation	200 ppm	20 ppm	8.82
Xylenes	0.39 J µg/L	GW	OWDFMW01	Inhalation	100 ppm	100 ppm	8.45, 8.56

µg/L microgram per liter
 AST aboveground storage tank
 GW groundwater
 IP ionization potential
 J estimated concentration
 mg/kg milligram per kilogram
 N/A not applicable
 OWDF Oily Waste Disposal Facility
 PEL permissible exposure limit
 TCE Trichloroethylene
 TLV threshold limit value
 UDA unauthorized discharge area

^a There may be other routes of exposure, but these are the more likely routes.

^b Values are for mineral oil.

Volatile Organic Compounds

VOCs are organic chemical compounds with high enough vapor pressure under normal conditions to vaporize and enter the atmosphere. VOCs include carbon-based molecules, such as aldehydes, ketones, and other light hydrocarbons. Common artificial VOCs include paint thinners, dry cleaning solvents, and some petroleum fuel constituents.

Benzene

Short-term exposure to benzene may cause dizziness, rapid heart rate, headache, tremors, confusion, and unconsciousness. Long-term exposure can cause leukemia, more specifically myeloid leukemia (ATSDR 2007a).

Toluene

Exposure to toluene can have temporary effects to the nervous system that include headaches, dizziness, and unconsciousness. With repeated exposure, other effects, such as cognitive impairment, vision and hearing loss may become permanent. Other potential health concerns include effects to the immune, kidney, liver, and reproductive organs (ATSDR 2000).

Xylene

Short-term exposure to xylene can cause skin, eye, nose, and throat irritation, difficulty breathing, impaired lung function, loss of memory, stomach pain, and possible changes to the liver and kidneys. Short-term and long-term exposure cause issues to the nervous system, such as headaches, impaired muscle coordination, confusion, dizziness, and loss of balance (ATSDR 2007b).

Total Petroleum Hydrocarbons

Diesel Range Organics

Exposure to diesel fuels can produce intoxication and other central nervous system depression effects in cases of acute exposure, and can lead to defatting of skin and contact dermatitis in case of contact exposure. Diesel fuel contains small quantities of volatile hydrocarbon additives, including benzene, toluene, ethylbenzene, and xylenes members. Control of inhalation exposure to diesel fuel (and its various constituents) can be accomplished through the use of air-purifying respirators equipped with organic vapor cartridges. The use of skin protection (e.g., chemical protective gloves) is required when handling potential or confirmed diesel-contaminated materials.

Residual Range Organics

Residual fuel oils are composed of higher-molecular-weight carbon chain molecules and present properties (e.g., low vapor pressure) similar to hydraulic fluids. As with hydraulic fluids, waste oils present no significant vapor hazard; exposure hazards are limited to skin contact. Irritation of the skin may result from prolonged exposures.

Polynuclear Aromatic Hydrocarbons

PAHs are present in coal tar, in products of incomplete combustion, and in some fuels. PAHs in the pure state are yellowish crystalline solids. These chemicals have varying degrees of potency for causing cancer, with benzo(a)pyrene being among the most potent. The PAHs are evaluated collectively as coal tar pitch volatiles. Coal tar pitch volatiles may cause photo-sensitization and a rash where sunlight strikes the skin. Exposure may also cause cancer of lungs, skin, bladder, or kidneys. Benzo(b)fluoranthene, benzo(j)fluoranthene, benzo(k)fluoranthene, benzo(a)pyrene, chrysene, and indeno(1,2,3-cd)pyrene have been identified as carcinogenic.

This information on PAH compounds is presented for site contaminant awareness. While the potential for site personnel sustaining significant inhalation exposures to volatilized PAH compounds during the site activities of this project is minimal, there is the potential for inhalation of PAH-contaminated dust, and handling of contaminated soils presents skin exposure hazards. Use of dust-suppression techniques (as appropriate) and the proper use of air-purifying respirators equipped with organic vapor and particulate cartridges and chemical protective gloves will adequately protect personnel.

2.2.1.3 ASSESSMENT OF CHEMICAL HAZARDS

The COPCs that may remain at the Oily Waste Disposal Facility are TPH-d, TPH-o, and PAHs. There is thus the potential for exposure to these chemicals during project field activities through two direct route (inhalation and skin contact) and one indirect route (ingestion). A description of exposure hazards for each contaminant type is presented in Section 2.2.1.2.

Inhalation

Soil and groundwater may contain residual COPCs; therefore, personnel may be exposed via inhalation during drilling and sampling. Real-time air monitoring for airborne organic compounds using a photoionization detector (PID) will be conducted during these activities.

Given past sampling efforts and site characteristics (i.e., asphalt pavement cover or heavily vegetated), planned activities are not expected to generate large quantities of dust; therefore, significant occupational exposure to airborne contaminant concentrations at realistic airborne dust levels is not expected and is not considered to be a significant hazard. Water will be used to control dust during drilling and site grading (i.e., access pathway and drill pad construction), and to reduce the potential for respirable crystalline silica during well installation activities. Real-time time monitoring for airborne particulates using a dust monitor, however, will be also conducted during these activities.

Skin Contact

Contact with contaminated media is likely during collection and handling of environmental samples. Use of protective gloves and clothing (Section 6), protects against skin contact and adsorption.

Ingestion

Contamination of the hands or skin during site activities could transfer the contaminants to food or drinks that are subsequently ingested. Protection against exposure via ingestion is by following proper decontamination procedures when exiting the work area (Section 11), practicing good personal hygiene, and refraining from eating or drinking in the work zone.

2.2.2 Physical Hazards

The following physical hazards and related safety controls have been identified for the proposed field activities. Detailed physical AHA forms are included in APP Appendix A.

2.2.2.1 DRIVING TO AND FROM SITE

All vehicles driven to and from the project site will be properly maintained and inspected daily before use. Drivers must be properly licensed, trained, and medically fit to operate a vehicle. Only authorized drivers will operate a motor vehicle while conducting business for AECOM. Personnel must obey all traffic laws. Cell phone use including hands-free technology is prohibited while driving. All occupants must wear a seat belt while the vehicle is in motion. All loads will be secured properly. Drivers must be alert, drive defensively, and not allow themselves to become fatigued. In addition, personnel will follow the guidelines provided in SH&E SOP S3AM-005-PR1, *Driving* (APP Appendix E).

2.2.2.2 TRAFFIC SAFETY

Operators of vehicles or mobile equipment used during the field activity will obey all applicable traffic laws, operate the vehicles and equipment in a safe manner, and not put other workers in harm's way. Vehicle or equipment operators will not offer or accept riders as passengers on vehicles or equipment that are not designed to carry passengers.

2.2.2.3 *SLIPS, TRIPS, FALLS, AND PROTRUDING OBJECTS*

Hazards from protruding objects, careless movements, or placement of materials along paths or foot-traffic areas can lead to slips, trips, falls, and puncture wounds. Personnel should make reasonable efforts to prevent these types of accidents and injuries. These efforts may involve installing temporary handrails and guides, using walking poles, and wearing puncture-resistant gloves and full eye enclosure goggles. SH&E SOP S3AM-001-PR1, *Safe Work Standards and Rules* (APP Appendix E), will be implemented to prevent associated hazards.

2.2.2.4 *COMPRESSED GAS CYLINDERS*

The low-flow groundwater sampling for this project requires the use of compressed nitrogen gas cylinders. Onsite orientation on the use and hazards of the equipment will be completed for all employees handling or coming into contact with compressed gas cylinders. Prior to use, cylinders will be inspected using SH&E SOP S3AM-114-FM1, *Compressed Gas Cylinder Inspection* (APP Appendix E). The use of blown compressed air is to be controlled, and proper personal protective equipment (PPE) or safeguards used to protect against the possibility of eye injury to the operator or other persons. Cylinders are not to be used unless they bear United States (U.S.) Department of Transportation (DOT) or Transportation of Dangerous Goods (TDG) markings showing that they have been tested as required by DOT and TDG regulations. General information regarding compressed air handling procedures is provided in Section i.45 of the APP.

2.2.2.5 *MANUAL AND POWERED HAND TOOLS*

Hand tools may be used during geophysical surveying, drilling, monitoring well installation and development, groundwater sampling, land surveying, and other activities. Potential tools used include but are not limited to: mallets, hand wrenches, screwdrivers, and impact (air) wrenches. All personnel will observe the procedures identified in SH&E SOP S3AM-305-PR1, *Hand & Power Tools* (APP Appendix E), when using tools and equipment. Visual inspection of the hand tools will be performed prior to their use, and defective or damaged tools will be removed from the project and repaired or replaced.

2.2.2.6 *HAZARDOUS NOISE ENVIRONMENTS*

Working around drill rigs and other heavy equipment often creates excessive noise. The effects of noise can include physical damage to the ear, pain, and temporary or permanent hearing loss. Workers can also be startled, annoyed, or distracted by noise during critical activities. SH&E SOP S3NA-118-PR1, *Hearing Conservation* (APP Appendix E), provides guidance related to noise exposure and associated prevention measures.

Workers will be required to wear appropriate hearing protection during site activities when drilling rigs or other heavy equipment is operated because an action level of 85 decibels in the A-weighting (dBA) has the potential of being exceeded for this project. The DOT cites that 88 dBA is a reasonable noise level to expect for used equipment with an engine horsepower of 400 or less (DOT 2013). Hearing protection devices (earplugs or muffs) with a minimum noise reduction rating of 25 dBA will be worn by the operator while the equipment is operating, and ear plugs will be worn by all other personnel at the site.

2.2.2.7 *HEAVY MACHINERY*

The use of heavy machinery (e.g., drill rig, excavator) in areas where unprotected personnel are working warrants special attention on the part of all personnel. Operators will ensure that equipment is working properly and being run in a safe manner. Also, operators will be aware of the location of unprotected personnel at all times while operating this machinery to avoid serious accidents.

To ensure that all equipment used on site presents no unwarranted safety hazards, the owner or operator of each drill rig or heavy equipment must perform a safety evaluation and certification in accordance with the procedures and requirements detailed in EM 385-1-1 Section 18.H (USACE 2014), SH&E SOP S3AM-321-PR1, *Drilling, Boring, & Direct-Push Probing*, and SH&E SOP S3AM-309-PR1, *Heavy Equipment* (APP Appendix E). The drill operator will complete and provide to the field manager (FM) the *Machinery and Mechanized Equipment Certification Form* for each piece of heavy equipment within 7 days prior to the start of work to confirm it is in good working order before it is brought on site. On a daily basis, the forms *Heavy Machinery Pre-Operation Checklist* (S3AM-309 FM2) and *Daily Drill, Boring & Direct-Push Equipment Inspection* (S3AM-321-FM1) will be completed by the competent person and kept on file on site. A copy of these forms is provided in APP Appendix E.

In addition, each rotary-auger drilling rig will meet the guarding requirements specified in EM 385-1-1, Section 18.H (USACE 2014) by use of one of the following methods:

Method 1 – Fixed Guard

Install a fixed-place guard meeting the following requirements:

- The guard must be attached directly to the drilling mechanism.
- The guard must fully enclose all sides of the rotating drill mechanism (e.g., auger) such that direct physical contact with any rotating component is prevented.
- The guard, or any portion of the guard, must be removable. Additionally, an interlock system or similar device that prevents operation of the drilling mechanism when the guard is not properly positioned must be in place.
- The guard must be fully in place WHENEVER the drilling mechanism is engaged or any component is rotating. Disabling of any interlock system, except during maintenance activities by a qualified provider, is prohibited.

Method 2 – Movable Barricade

Use a movable enclosure (barrier) that meets the following requirements:

- The enclosure must be designed so that it can be positioned to fully enclose all exposed sides of the rotating drill mechanism (e.g., auger).
- Each side of the enclosure must meet one of the following requirements:
 - Barrier must be at least 3.5 feet high and constructed to prevent passage past the barrier by a person, and be positioned to prevent a person from approaching closer than 4 feet from any rotating mechanism or component of the drill rig, or be at least 6 feet high and manufactured such that direct physical contact with any rotating component through the enclosure is prevented.
 - Operating procedures that prohibit operation of the drilling mechanism unless the enclosure is properly positioned must be in place, and the area must be free of all personnel and equipment.

Method 3 – Automatic Brake

The drill rig is equipped with an automatic brake activated by a presence-sensing device, which prevents contact with rotating components while the drill rig is in operation.

Finally, each drill rig must be equipped with at least two independent emergency shut-off switches, either of which can deactivate power to all rotating components. These switches must be readily visible and able to be activated by a single hand movement (e.g., palm-switch). One switch must be located at the drill rig operator's station and the other on the opposite side of the drilling mechanism, where it can be reached and activated (without moving the guarding mechanism) by a person standing at ground level on the opposite side of the drill rig from the operator. The location of the shut-off switches should be conveyed to field staff prior to drilling.

2.2.2.8 REPETITIVE MOTION AND OVEREXERTION INJURIES

For field team members who are expected to work in difficult terrain using a variety of hand tools for extended periods of time, there is an increased risk for injuries from repetitive motion and overexertion. The three common types of injuries are:

- *Tendonitis*: Inflammation of the tendons that join muscles to bones caused by injury or overuse.
- *Muscle Strain*: Small tears caused by too much force exerted on the muscle fibers.
- *Blisters*: Small pocket of fluid within the upper layers of the skin. A blister usually forms because the outer layer of the skin is damaged. Fluid collects under the damaged skin layer to cushion the underlying tissue in order to protect against further damage while allowing the skin to heal.

2.2.2.9 MANUAL LIFTING AND DRUM HANDLING

All personnel will observe the procedures identified in SH&E SOP S3AM-014-PR1, *Manual Lifting* (APP Appendix E), when performing manual lifting.

The handling of all containers used for storing materials will be performed in accordance with the following:

- Where containers of capacity greater than 10 gallons are used for containerizing chemical products or waste materials, handling of the containers is as follows:
 - When not in use, drums and containers will be covered with tight-fitting lids.
 - At the conclusion of each work shift, all drums and containers will be placed in a designated waste storage area. This area will be properly marked and secured.
 - Mechanical or powered drum-handling equipment will be used to move drums and containers. Manual handling of the drums should be avoided as much as possible as this can lead to musculoskeletal injuries.

If sampling of drums for waste characterization purposes is required, then it is to be done with minimal or no contact to the skin. Handling of potentially contaminated media poses the risk of direct contact with hazardous substances. To protect against skin contact with contaminated materials, all sample collection activities will be performed using Level D protective equipment ensembles. Specified personnel decontamination procedures will also be observed.

2.2.2.10 SPILL CONTAINMENT

Work activities may involve the use of hazardous materials (e.g., fuels, solvents) and drums or other containers. The following procedures are to be implemented to prevent or contain spills:

- All hazardous material will be stored in appropriate containers.
- Tops and lids will be placed back on containers after use.
- Containers of hazardous materials will be protected from site activities involving vehicles, drill rigs, or other heavy equipment, as appropriate.
- At least one spill response kit, including items such as an empty container suitable for booming or diking the area to minimize the size of the spill and appropriate clean-up material, will be available at each work site.
- Containers for all hazardous material in use (e.g., fuels) will be properly labeled.

Containers will only be lifted using equipment specifically manufactured for that purpose.

2.2.3 Biological Hazards

Biological hazards are everywhere and change with the region and season. During project planning stages, ask the site point of contact if there are insect or other biological hazards that have been noted at any of the work sites.

If you encounter a biological hazard that has not been identified in this plan, contact the SHM so that a revision to this plan can be made. Whether it is contact with a poisonous plant, a poisonous snake, or a bug bite, do not take bites or stings lightly. If there is a chance of an allergic reaction or infection, seek medical advice on how to properly care for the injury. Refer to SH&E 313, Biological Hazards: Wildlife, Plants, and Insects.

2.2.3.1 MOSQUITOES

Mosquitoes are a threat to human health and well-being. As mosquitoes need water to complete their life cycle, there is the potential for rapid population growth especially following rain events that leave behind standing water (e.g., ponds, puddles). Potential mosquito-breeding sites are often created during construction activities, such as when equipment and vehicles leave ruts and dips for water to collect or when normal runoff routes are disrupted and impede drainage.

Female mosquitoes bite to feed and while feeding may transmit diseases or disease-causing organisms to humans and animals, which include West Nile Virus, encephalitis, Zika virus, and dengue fever. To avoid the threat of mosquitoes at the work site, check to be sure containers are not left to collect water, avoid leaving severe depressions in the ground, and fix or report any clogged drainage ways or ditches.

For mosquito bite prevention, follow the steps below:

- Apply insect repellent on exposed skin and clothing (if using sunscreen, apply the sunscreen first).
- Select an insect repellent with the active ingredients recommended by Centers for Disease Control and Prevention and the EPA, such as diethyltoluamide, picaridin, Insect Repellent 3535, or plant-based oil of lemon eucalyptus.
- Cover up as much as you can without interfering with the required PPE.

2.2.3.2 *BEES AND OTHER STINGING INSECTS*

Several types of bees and wasps may be encountered during field activities. These include the common yellow jacket, paper wasps, and honey and carpenter bees. Bees are generally not as aggressive as wasps. Most stinging insects are relatively safe to be near, even in large numbers, so long as they are not aggravated. However, dozens of people die each year from insect stings, mostly due to anaphylactic shock, although some are the direct result of toxins. Bee venom appears to contain more proteins than wasp venom; therefore, there is greater likelihood of being allergic to bees than wasps. Bee and wasp stings are quite different. The wasp may sting a victim multiple times and still survive. The bee stings just once, leaving the stinger embedded and connected to the venom sac, which continues to pump venom into the victim for up to a minute from the time of insertion.

Prevention of Bee and Wasp Stings

The following precautions will be taken during field activities for the prevention of stings from bees and wasps:

- Be aware of the presence of bees and wasps while working, especially in the vicinity of flowers. Bees tend to sting if they feel threatened or are disturbed, so work cautiously to avoid disturbing them.
- Keep sources of water in work areas under control as bees are attracted to open water sources or leaking water containers.
- Avoid wearing floral patterns or using floral scents, which will attract bees.
- Personnel who are sensitive to bees must let the SSHO know and should carry a bee sting kit with them.
- If bees or wasps get trapped inside your vehicle while you are driving, pull off to the shoulder lane and let the insects escape before you continue driving.
- In the event of a massive sting attack, try to stay calm, cover your head if possible. Get into anything that is sealed (such as vehicle) so as not to allow insect entry.

Treatment of Normal Insect Stings

All bee stings include an alarm pheromone, which incites their mates to attack, so your first response should be to get away from the nest or hive quickly. To treat a normal bee sting: 1) scrape or pull out any honeybee stingers (wasps do not leave stingers) as soon as possible as they are attached to a pump that continues to introduce venom for one minute after stinging; 2) apply an ice pack to minimize swelling and pain while lifting the limb to heart level to reduce swelling.

Treatment of Severe Reaction to Insect Stings

If the victim has been stung multiple times, is young or old, or is experiencing anaphylactic shock, seek immediate medical help. Signs of anaphylactic shock may include:

- Localized swelling and redness at sting area
- Headache
- Fever
- Nausea
- Vomiting

- Swelling of the tongue or throat
- Difficulty in breathing
- Increased heart rate
- Drowsiness
- Unconsciousness

For any personnel with known sensitivity to stings and who have an EpiPen, administer the EpiPen, apply ice pack, and have the person taken to the hospital. Personnel on the site who know they are allergic to bee stings are required to notify the SSHO and their co-workers and should have their EpiPen with them at all times. Co-workers should know where the kit is located and how to properly administer it in an emergency.

2.2.3.3 *SNAKES*

Snakes typically are found in underbrush and tall grassy areas. If you encounter a snake, stay calm and look around; there may be other snakes. Turn around and walk away on the same path you used to approach the area. If a person is bitten by a snake, wash and immobilize the injured area, keeping it lower than the heart if possible. Seek medical attention immediately. **DO NOT** apply ice, cut the wound, or apply a tourniquet. Try to identify the type of snake: note color, size, patterns, and markings.

2.2.3.4 *TICKS*

Ticks typically are in wooded areas, bushes, tall grass, and brush. Ticks are black, black and red, or brown, and can be up to ¼-inch in size. Wear tightly woven light-colored clothing with long sleeves and pant legs tucked into boots. Spray **only outside** of clothing with permethrin or Permethrin, and spray skin only with N,N-diethyl-m-toluamide (DEET). Check yourself frequently for ticks.

If bitten by a tick, grasp it at the point of attachment and carefully remove it. After removing the tick, wash your hands and disinfect and press the bite areas. Save the removed tick. Report the bite to the AECOM occupational health manager. Look for symptoms of Lyme disease (e.g., a rash might appear that looks like a bull's-eye with a small welt in the center) or Rocky Mountain spotted fever (e.g., a rash of red spots under the skin 3 to 10 days after the tick bite). In both cases, chills, fever, headache, fatigue, stiff neck, and bone pain may develop. If symptoms appear, seek medical attention.

2.2.3.5 *SAFETY (POISON IVY AND POISON SUMAC)*

Poison ivy, poison oak, and poison sumac typically are found in brush or wooded areas. They are more commonly found in moist areas or along the edges of wooded areas. Become familiar with the identity of these plants. Wear protective clothing that covers exposed skin and clothes. Avoid contact with plants and the outside of protective clothing. If skin contacts a plant, wash the area with soap and water immediately. If the reaction is severe or worsens, seek medical attention.

2.2.4 **Immediately Dangerous Hazards to Life and Health**

This section is not applicable because no immediately dangerous to life and health hazards have been identified at this site.

2.2.5 **Ionizing Radiation Hazards**

Radiological hazards are not anticipated within the project area.

2.2.6 Non-ionization Radiation Hazards

The most likely exposure to non-ionizing radiation is the sun. Personnel will receive instruction on appropriate hydration, PPE, and other procedures in the event of non-ionizing radiation concerns. Personnel working in direct sunlight are encouraged to wear tightly-woven clothing that blocks light and apply sunscreen per manufacturer's directions to all unprotected skin surfaces. The use of wide brimmed hats is recommended. Sunscreen will be provided for use by project personnel while working on-site. Other forms of non-ionizing radiation hazards such as lasers, are not anticipated within the project area.

2.3 SITE RISKS

2.3.1 Hazardous Substances and Other Health Hazards

During the project activities, site personnel may be exposed to hazardous substances such as site contaminants and chemical products brought on-site for project activities.

Site risks for specific hazardous substances and health hazards have been identified, including:

- Potential routes of exposure
- Chemical, physical, and toxicological properties
- Procedures and protocols that have been established to inform project personnel of and mitigate potential risk

Descriptions of each hazardous substance and health hazard are listed in Section 2.2.

3. Activity Hazard Analysis

3.1 MAJOR TASKS AND ACTIVITY HAZARD ANALYSIS

For this project, AECOM will perform tasks associated with the remedial investigation at NBK Keyport OU 2 Area 8. Project tasks include: field investigation including a geophysical survey, well installation, soil and groundwater sample collection, and a horizontal and vertical survey of all new sample collection locations.

Performance of these tasks may expose personnel to a variety of hazards related to work operations, the physical condition of the work site, and the potential presence of environmental contaminants. The following sections outline the potential chemical and physical hazards that may be encountered during the project and discuss the requirements and guidelines for achieving a safe work environment.

The project site activities that require an AHA include the following:

- Site visit and mobilization
- Subsurface utility clearance and geophysical testing
- Down-hole tools and data-logger deployment
- Drilling operations, well installation and subsurface soil sampling
- Monitoring well development
- Land survey
- Soil sampling

- Groundwater sampling
- Investigation-derived waste (IDW) management
- Precautions for COVID-19
- Site restoration and demobilization

Each AHA includes all physical and chemical hazards that may be encountered and contains the following information:

- Task and operation identification, site location, date prepared, preparer and reviewer.
- Identification of all competent persons and qualified persons for the job task. Proof of qualifications are included in APP Appendix C.
- Identification of job steps and work sequences.
- Analysis of chemical and physical hazards anticipated for each job step.
- Specific controls to be implemented to control hazards.
- Assignment of a Risk Assessment Code for each job step and the entire AHA.
- Site conditions.
- List of equipment to be used for the task or operation, including PPE.
- List of training requirements.
- List of inspection requirements.

AHAs for each activity are included in APP Appendix A.

3.2 AHA REVIEW

All AHAs will be reviewed and approved by project SHM and U.S. Department of the Navy (Navy) remedial project manager (RPM) prior to the start of field work.

3.3 AHA MODIFICATION

In the field, AECOM personnel and subcontractors will conduct a thorough review of the AHA for a specific task prior to performing any task-related field work.

At this time, the field team may update the AHA to reflect changes in:

- Site conditions
- Project scope
- Site operations
- Construction methods
- Construction schedules
- Personnel roles and responsibilities
- Need for competent and qualified persons

If the initial Risk Assessment Code for the activity is escalated due to changes in the AHA, then the AHA will be resubmitted to the AECOM contract task order (CTO) manager, SHM, and Navy RPM for review and approval prior to the start of field work.

AECOM will ensure that all personnel affected by changes in AHAs are informed. AHA modifications of a task will be reviewed and discussed prior to starting on the task and during the daily safety meeting. Attendance at meetings to review new information is required for all site workers and will be documented.

3.3.1 AHA Acceptance

No field work will be conducted prior to Navy review and acceptance of required AHAs.

3.3.2 AHA Accessibility

The project AHAs are readily available on the project site. Site workers will be trained on the AHAs and will have them in their possession while on-site.

4. Staff Organization, Qualifications, and Responsibilities

Project staff organization is outlined, key personnel are identified, and their responsibilities are explained in APP Section d.2. Project staff lines of authority and communication are explained in APP Table 3 and Figure 3.

5. Training

Training requirements are discussed in APP Section f. APP Table 5 includes all training required for project personnel, including Occupational Safety and Health Administration (OSHA) HAZWOPER requirements. Certificates of training completion will be maintained on-site when practicable or at the main AECOM office in Honolulu, Hawaii. No employees will be allowed to work or supervise at the site until they have received all project training at the level of their job function and responsibility.

6. Personal Protective Equipment

The PPE program for this project has been created in accordance with EM-385-1-1 Sections 5 and 33.B.02 (USACE 2014); 29 CFR 1910.120(g)(5) *Engineering controls, work practices, and personal protective equipment for employee protection* and 1926.65(g)(5) *Personal protective equipment (PPE) program*, and Subpart I *Personal Protective Equipment*; and AECOM SH&E SOP S3NA-208-PR1, *Personal Protective Equipment* (APP Appendix E).

PPE acts as a barrier that shields or isolates the individual from the chemical and physical hazards that may be encountered during work activities. AECOM SH&E SOP S3NA-208-PR1, *Personal Protective Equipment* (APP Appendix E), lists the general requirements for selection and usage of PPE. Table 3 lists the minimum PPE required for site operations and additional PPE that may be required. The minimum levels of protection required to begin each activity of this project is also presented in the AHAs located in APP Appendix A. All personnel on site will be trained in the proper inspection of their PPE. For instance, gloves will be changed frequently (worn less than 1 hour) and continually inspected for damage. If there are any signs of deterioration or damage, the PPE must be disposed of and replaced immediately. Although work will be required on the beach during low tide, the use of personal floatation devices (PFDs) is not expected to be necessary. However, should field conditions change and the use of PFDs becomes necessary, U.S. Coast Guard Type III PFDs will be maintained onsite. Additionally, relevant AHAs will be amended to include the use of PFDs and work adjacent to water.

Table 3: Minimum Level of Protection Requirements

Major Phases of Work	Level of PPE Protection
Access Pathway and Drilling Pad Construction	Level D
Access Gate Installation	Level D
Decontamination	Modified Level D – Protective gloves (nitrile 6 mm double)
Dedicated Groundwater Pump System Installation	Level D
Drilling and Subsurface Soil Sampling	Modified Level D – Protective gloves (nitrile 6 mm double), and foam or silicone ear plugs (minimum noise reduction rating of 25 dBA)
Groundwater Sampling	Modified Level D – Protective gloves (nitrile 6 mm double)
Investigation-Derived Waste Management	Modified Level D – Protective gloves (nitrile 6 mm double)
Land Survey	Level D
Mobilization and Demobilization	Level D
Monitoring Well Installation and Development	Modified Level D – Protective gloves (nitrile 6 mm double), and foam or silicone ear plugs (minimum noise reduction rating of 25 dBA)
Subsurface Utility Clearance and Geophysical Survey	Level D
Vegetation Clearance	Modified Level D – Foam or silicone ear plugs (minimum noise reduction rating of 25 dBA), face shield, and chaps and shin guard.

dBA decibel (A-weighted scale)
 mm millimeter

Level D PPE consists of:

- High-visibility reflective work clothes such as coveralls, long pants, and shirts with sleeves
- Clothing under coveralls
- *Work gloves*: chemical-resistant for sampling, decontamination, and IDW management (nitrile 6 millimeter double), leather or cotton as necessary for physical hazards
- American Society for Testing and Materials F2413-compliant safety boots; Tyvek boot covers for sampling, decontamination, and IDW management
- American National Standards Institute (ANSI) Z87.1-compliant safety glasses or safety goggles
- ANSI Z89.1-compliant hard hat (required when staff are working around heavy equipment)
- Face coverings consisting of cloth or other suitable material that cover the nose and mouth area while fitting snugly but comfortably against the side of the face (for specific procedures refer to APP Appendix A)

The effectiveness of the PPE program will be evaluated by the SSHO in accordance with AECOM SH&E procedure S3AM-128-PR1, *Medical Screening & Surveillance* (APP Appendix E). If additional hazards are identified that require a higher level of protection and changes to the program are deemed necessary, the SSHO will inform the AECOM CTO manager and SHM and amend the PPE requirements in the AHAs.

AECOM will ensure that all personnel affected by changes in PPE are informed. PPE modifications for a task will be reviewed and discussed prior to starting work and during the daily safety meeting. Attendance at meetings to review new information is required for all site workers and will be documented.

In accordance with OSHA 29 CFR 1910, Subpart I, PPE will be provided, used, and maintained in a sanitary and reliable condition. All PPE will be of a construction, design, and material that provide protection against known or anticipated hazards. PPE shall properly and appropriately fit the employee. Any concerns regarding the use of appropriate PPE will be brought to the attention of the SSHO, who will contact the AECOM SHM for assistance in evaluation of the PPE as necessary.

Site personnel will be required to wear on site at all times approved PPE that meets applicable ANSI or OSHA requirements. Hard hats must be worn properly and not altered in any way that would lessen the degree of protection.

Eye protection, including safety glasses with side shields, will be required during all work on-site and especially in conditions where airborne objects may be projected or blown into the eyes or where exposure to hazardous materials may occur.

7. Medical Surveillance

Medical surveillance of field staff and subcontractor employees will be conducted in accordance with EM-385-1-1 Section 33.E (USACE 2014); 29 CFR 1910.120(f) *Hazardous Materials: Medical Surveillance* and 29 CFR 1926.65(f) *Safety and Health Regulations for Construction: Medical surveillance*; and AECOM SH&E SOP S3AM-128-PR1, *Medical Screening & Surveillance* (APP Appendix E).

7.1 INITIAL AND PERIODIC MEDICAL TESTING AND CERTIFICATION

All personnel engaged in operations at a hazardous waste site must have completed a physical exam prior to reporting for site work. As part of the exam, workers assigned to tasks with potential exposures are offered vaccinations at no cost to the employee, are recommended prior to the start of work and/or have had an occupational exposure, whether as a result of their assigned task, or occurring from incidental contact. For workers traveling to the approved country of employment, the project manager is responsible for taking all precautionary measures for medical clearances, obtaining immunizations as directed per Centers for Disease Control and Prevention Yellow Book, Health Information for International Travel, and managing risks using sound judgement (see SH&E SOP S3AM-214-PR1 *International Travel* in APP Appendix E). Employees who decline vaccination shall sign a copy of the waiver form. The signed waiver will be stored in the appropriate project files along with the employee's medical record with the Occupational Health Manager. Employees may initially decline the vaccination, but may decide to take them at a later date. Employees choosing to take the vaccination series will sign a consent form at the occupational clinic prior to receiving the injections, and are advised to read the package insert regarding the efficacy, safety, method of administration, and benefits of the vaccine. Employees are not required to participate in a prescreening program to determine immunity before receiving the vaccinations. If a routine booster is recommended by the U.S. Public Health Service at a future date, such booster dose(s) will be made available to affected employees (see SH&E SOP S3AM-111-ATT1 *Bloodborne Pathogens Exposure Control Plan* in APP Appendix E).

The medical surveillance program will be performed by, or directly supervised by, a physician board-certified in occupational medicine in accordance with 29 CFR 1910.120, 29 CFR 1926.65, and the *Department of the Navy Environmental Restoration Program Manual* (Navy 2018). The examining physician will specify exam procedures and tests.

The results of the medical examination will be evaluated by a physician board-certified in occupational medicine. The medical evaluation must include a judgment of a person's ability to use respiratory protective equipment and to participate in hazardous waste site activities. The examining physician

must document the evaluation and recommendations in writing. Personnel with certain medical conditions that could be aggravated by chemical exposure or by the physical demands of the work may be restricted from certain on-site activities. Each employee is responsible for notifying the SSHO and SHM of any physical or medical restrictions. The SHM will then ensure that project management enforces the restrictions. A copy of each person's written medical clearance will be made available for review following a request from the SHM. Personnel who have not received a medical examination within 12 months (365 days) of their previous medical exam will be required to get a medical exam immediately and to provide a copy of their medical clearance to the SHM for review prior to starting work on the project, unless otherwise directed by the occupational physician.

Certification of participation in the medical surveillance program, which includes the name of the site worker, date of last examination, and the name of the examining physician, will be maintained on site with the SSHO. Subcontractors are required to provide certifications as proof that personnel have medical clearance to work at a hazardous waste site.

7.2 SUPPLEMENTAL EXAMINATION

Any worker who has been exposed to hazardous chemical or biological material at a potentially harmful level or exhibits signs or symptoms of possible exposure will undergo a supplemental examination. The physician will certify in writing that the affected worker is fit to return to work. If necessary, activity restrictions will also be specified in writing. Additional tests may be conducted as the nature of the contaminant or exposure dictates and as judged by the examining physician.

7.3 HEALTH CARE ADMINISTRATIVE SERVICES

Medical records will be established and maintained by the physician in support of the Medical Monitoring Program. These records will be treated as private and confidential. The information in these records shall be complete enough to provide useful data for health maintenance, treatment, and epidemiologic studies and for program evaluation and improvement. The medical record will contain sufficient information related to patient identification, evidence supporting a diagnosis, treatment justification, and additional follow-up treatment or referrals. The physician's written opinion for all medical examinations will be as specified in 29 CFR 1910.120, Subpart (f)(7).

8. Exposure Monitoring

This section presents monitoring procedures that will be employed during field activities to assess employee exposure to site-related contaminants and hazardous substances, and to evaluate PPE effectiveness.

Monitoring will consist primarily of observations and measurements of various parameters including airborne contaminant concentrations, noise levels, and heat stress effects, but may be supplemented by more sophisticated monitoring techniques, if necessary. The SSHO will log the exposure monitoring results in the logbook, which is available for project personnel to review. Monitoring results will be made available to monitored employees at the end of the workday as necessary.

8.1 MONITORING INSTRUMENTATION

To assess the exposure potential to environmental contaminants during field activities, on-site monitoring will be performed using real-time instrumentation such as is shown in Table 4.

Table 4: Monitoring Instrumentation

Instrument	Manufacturer and Model ^a	Substances Detected
PID	RAE Systems mini-RAE Photovac Microtip HNU Model Hnu or equivalent	VOCs
Dust Monitor	Thermo Scientific Personal DataRAM pDR-1500 fitted with cyclone (4 µm cut point [respirable fraction]) or equivalent	Particulates in air
Noise Dosimeter	Metrosonics Chameleon or equivalent	Sound pressure level (in dBA)

µm micrometer

LEL lower explosive limit

^a Or similar unit, as approved by SHM.

All monitoring equipment will be calibrated before and after each period of use in accordance with the manufacturer’s written procedures for each device and standard industrial hygiene practice. Calibration information for each instrument will be recorded in the site log. Only accredited laboratories will be used to perform sample analysis.

8.2 MONITORING PROCEDURES AND ACTION LEVELS

The monitoring procedures outlined in Table 5 will be followed during all intrusive activities. The main pathway of concern is inhalation.

Table 5: Monitoring Procedures and Action Levels for Intrusive Activities

Parameter	Activity	Zone Location and Monitoring Interval	Response Level	Response Activity
VOCs (total by PID)	<ul style="list-style-type: none"> Drilling Monitoring Well Installation Monitoring Well Development Groundwater Sampling 	Breathing Zone, every 15 minutes during drilling activities, well development and groundwater sampling	<0.5 ppm (sustained for more than 5 minutes)	Continue work in required PPE and continue monitoring.
			0.5 to 5.0 ppm (sustained for more than 5 minutes)	Contact the SHM, implement mitigation measures, and upgrade PPE to Level C (organic vapor cartridge).
			>5.0 ppm	Cease work, exit, and contact the SHM and CTO manager.
Airborne Dust	<ul style="list-style-type: none"> Drilling (Establish baseline dust levels on first day of drilling, discontinue monitoring if baseline readings do not exceed 1 mg/m³ and the occupational exposure is representative for the work activities) Monitoring Well Installation (Bentonite grout mixing activities) 	Breathing zone, every 15 minutes or data logged ^a , during drilling and silica-based bentonite grout mixing activities	<1 mg/m ³	Continue work in required PPE and continue monitoring.
			1–2 mg/m ³ (If sustained following dust suppression for more than 5 minutes)	Institute dust suppression measure: contact the SSO, upgrade PPE to Level C (organic vapor and P100 cartridge with high efficiency particulate air filter), and continue monitoring.
			>2 mg/m ³	Cease work, exit, and contact the SHM and CTO manager.
Sound Level	<ul style="list-style-type: none"> Drilling Hand and power tools Vegetation clearance 	Employee closest to the operating equipment	≥85 dBA	Require the use of hearing protection by personnel exposed to a sound pressure level exceeding 85 dBA.

mg/m³ milligram per cubic meter

PM project manager

^a Data logging will be permitted if the dust monitor alarm is active and set to 2.5 mg/m³.

Historically, the site has had detections of COPCs in groundwater and soil. For this reason, air monitoring efforts will be required during intrusive activities. Ambient air in the work zone will be monitored every 15 minutes during intrusive and sampling activities using a PID. Sound pressure levels will be measured using a noise dosimeter to determine noise exposures during drilling and vegetation clearance activities and dust level will be monitored during intrusive activities.

The FM or SSHO will log the air monitoring results in the field logbook. The FM or SSHO will note the monitoring results in the field logbook or appropriate monitoring log form (S3NA-118-FM2, *Sound Level Survey*; S3AM-127-FM1, *General Industrial Hygiene Survey*, S3AM-127-FM8, *PID/FID Monitoring Report*).

Use and application of the monitoring instruments, sampling equipment, and calibration procedures for this project will comply with regulatory requirements and manufacturer's recommendations. Real-time instruments will be calibrated on a daily basis or when used. Calibration gases will be checked to ensure that expiration dates are honored. Some instruments may have multiple sensing capabilities, and appropriate calibration logs will be prepared for them as needed. When integrated samples will be taken, a calibration and data log sheet will be used showing instrument type, serial number, pre- and post-flows, name of person sampled, area and conditions description, media used, analytes, and other appropriate information. All calibration records will be maintained on-site and will be available for inspection.

8.3 EXPOSURE MONITORING TRAINING

Site personnel responsible for performing the monitoring have been trained on the following sampling-related activities:

- Procedures
- Equipment and instrumentation, including the following activities:
 - Calibration
 - Inspection
 - Use
 - Maintenance

8.4 DETERMINATION OF HAZARD

Any determination of concentrations of, and hazards from, hazardous or toxic agents and environments will be made by a qualified industrial hygienist or other competent person.

9. Heat and Cold Stress

Local weather conditions and the required use of PPE may produce an environment that requires restricted work schedules to protect employees from heat or cold stress. The SSHO will observe workers for any potential symptoms.

9.1 HEAT STRESS MONITORING

If temperature/relative humidity levels are expected to present heat stress conditions, a wet bulb globe thermometer (WBGT) will be onsite and used to measure heat stress parameters. Work-rest cycles will be determined, and the appropriate measures taken to prevent heat stress.

Work-rest schedules will be established by the SSHO based on the screening criteria for Threshold Limit Value (TLV) and Action Limit for Heat Stress Exposure (Table 6) established by the American Conference of Governmental Industrial Hygienists (ACGIH 2014).

Table 6: Heat Stress Exposure TLV and Action Limits

Work Cycle (per hour)	TLV (°F)			Action Limit (°F)		
	Light	Moderate	Heavy	Light	Moderate	Heavy
75 to 100% Work	87.8	82.4	NR	82.4	77.0	NR
50 to 75% Work	87.8	84.2	81.5	83.3	78.8	75.2
25 to 50% Work	89.6	86.0	84.2	85.1	80.6	77.9
0 to 25% Work	90.5	88.7	86.9	86.0	84.2	82.4

°F Fahrenheit
 NR not recommended

It is expected that workloads will fall into the moderate category (walking with moderate lifting or pushing or carrying 50 pounds or less). If the WBGT reading exceeds 77.0 degrees Fahrenheit (°F) for personnel wearing standard work clothing, a work-rest cycle will be established, and the measures, will be taken to prevent heat stress.

9.1.1 Heat Stress Controls

The best approach to avoiding heat-related illness is through preventive measures to manage heat stress. Preventative measures to be implemented for this project will include:

Rest Areas: A relatively cool, shaded area will be provided for breaks when ambient temperatures exceed 80°F and workers are wearing regular work clothes. If shade is not available, a canopy will be constructed, or workers will have access to air-conditioned buildings or vehicles. Employees will have access to these rest areas at break times and at any other time a recovery period is needed.

Liquids: Water and electrolyte replacement drinks will be made available. Employees will have access to potable drinking water equivalent to one quart of water per employee per hour during the work shift. Workers should drink 16 ounces before starting work in the morning and after lunch, and 8 to 16 ounces at each break. Employees will be encouraged to avoid alcohol during non-work hours and caffeine during work hours when heat stress conditions are anticipated.

Acclimatization: When working in a heat stress environment, employees will need to adapt to the hot conditions. Workloads should start at 50 percent capacity and increase 10 percent each day to achieve 100 percent capacity. Acclimatization will start to decrease after 3–4 days and will be gone after one week of not working in a hot environment.

Heat stress controls to be implemented include:

- Allow workers to become acclimatized to the heat (3 to 6 days)
- Provide shaded or air-conditioned break areas
- Provide PFAS-free sunscreen to prevent sun burn
- Provide drinking water and electrolyte-replenishing fluids

The SSHO will assess conditions that may cause heat stress in site workers. All site workers will be familiar with the symptoms of heat stress illness described below and will report any symptoms to the

SSHO immediately. Personnel should monitor themselves and each other for the development of symptoms such as sudden fatigue, nausea, dizziness, irritability, malaise, flu-like symptoms, and lightheadedness.

Conditions related to heat stress:

Heat Rash may result from continuous exposure to heat or humid air. It appears as red papules, usually in areas where the clothing is restrictive, and gives rise to a prickly sensation, particularly as sweating increases.

To prevent heat rash, shower after work, dry off thoroughly, and put on clean, dry clothes. Try to stay in a cool place after work. See a physician if the rash continues to develop.

Heat Cramps are caused by heavy sweating with inadequate electrolyte replacement. Symptoms include muscle spasms and pain in the hands, feet, and abdomen.

First Aid for Heat Cramps: Leave the work area and rest in a cool, shaded place. Drink beverages that contain salt or eat salty food. Taking adequate breaks and drinking electrolyte replacement drinks should prevent cramps from returning.

Heat Exhaustion occurs from increased stress on various body organs including inadequate blood circulation due to cardiovascular insufficiency or dehydration. Signs and symptoms include:

- Pale, cool, moist skin
- Heavy sweating
- Dizziness
- Nausea
- Fainting
- Headache
- Blurred vision
- Vomiting

The key here is that the victim is still sweating, so the cooling system is still working; it's just under severe stress. The body core temperature may be elevated, but not higher than 104°F. It is important to recognize and treat these symptoms as soon as possible, as the transition from heat exhaustion to the very hazardous heat stroke can be quite rapid.

First Aid for Heat Exhaustion: Treatment involves replacing fluids (rehydration) and salts and removing the person from the hot environment. If symptoms are mild, sipping cool, slightly salty beverages every few minutes may be all that is needed. Removing or loosening clothing and applying a wet cloth or ice packs to the skin also aid cooling.

Heat Stroke is the most serious form of heat stress. Temperature regulation fails, and the body temperature rises to critical levels, typically at or above 104°F. Immediate action must be taken to cool

the body before serious injury and death occurs. Competent medical help must be obtained. Signs and symptoms are:

- Red, hot, usually dry skin
- Lack of or reduced perspiration (lack of perspiration may be masked for those wearing chemical protective clothing since perspiration from earlier in the day will be present)
- Nausea
- Vomiting
- Dizziness and confusion
- Strong, rapid pulse
- Coma

First Aid for Heat Stroke — THIS IS A MEDICAL EMERGENCY! SUMMON MEDICAL ASSISTANCE IMMEDIATELY!

While awaiting transportation to the hospital, a person should be wrapped in cold, wet bedding or clothing, immersed in a lake, stream, or cool bathtub, or cooled with ice. At the hospital, body cooling is usually accomplished by removing the clothes and covering the exposed skin with water or ice. To speed evaporation and body cooling, a fan may be used to blow air on the body. Body temperature is measured frequently, often constantly. To avoid overcooling, cooling is stopped when the body temperature is reduced to about 102°F.

9.2 COLD STRESS MONITORING

Cold stress is a concern when field crews are working outdoors in damp and cool (below 50°F) conditions or anytime temperatures are below 32°F. The appropriate measures taken to prevent cold stress.

Personnel should monitor weather forecasts each day and schedule work for the warmer part of the day. While working, ambient temperature, wind speed, and precipitation should be monitored, and a warming regimen should be implemented to allow workers breaks from the cold. Shelter to escape cold, wind, and precipitation, and a source of heat (such as warm packs or portable heaters) should be provided at the worksite. Other cold stress prevention controls include:

- Changing clothes when work clothes become wet with sweat
- Avoiding caffeine (which has diuretic and circulatory effects)
- Ensuring workers drink warm, sweet drinks or soups to increase their caloric intake and reduce the possibility of cold weather dehydration

When site conditions are as described above, workers should wear at least three layers of clothing, with an inner layer of cotton or synthetic material, a middle layer of down, wool, or similar material to provide insulation, and an outer layer to break the wind and allow some ventilation. A hat or hardhat liner will help maintain body heat, and insulated boots and gloves will reduce the chance of frostbite. Workers should keep a change of dry clothing available in case work clothes become wet; drink plenty of warm liquids, avoiding caffeine and alcohol; eat high-calorie snacks to help maintain body metabolism; and work in pairs and watch for signs of cold stress.

Hypothermia: Hypothermia results when the body loses heat faster than it can be produced. When this situation first occurs, blood vessels in the skin constrict in an attempt to conserve vital internal heat. Hands and feet are first affected. If the body continues to lose heat, involuntary shivers begin. This is the body's way of attempting to produce more heat, and it is usually the first real warning sign of hypothermia. Further heat loss produces speech difficulty, confusion, loss of manual dexterity, collapse, and finally death. Wet clothes or immersion in cold water greatly increases the hypothermia risk. The progressive clinical presentation of hypothermia is described in Table 7.

Frostbite: Local injury resulting from cold is included in the generic term frostbite. There are several degrees of damage. Frostbite can be categorized into the following:

Frost Nip or Initial Frostbite: (1st degree frostbite) Characterized by blanching or whitening of skin.

Superficial Frostbite: (2nd degree frostbite) Skin has a waxy or white appearance and is firm to the touch, but tissue beneath is resilient. Blistering and peeling of the frozen skin will follow exposure.

Deep Frostbite: (3rd degree frostbite) Tissues are cold, pale, and solid; extremely serious injury with possible amputation of affected area.

Frostbite can occur without hypothermia when the extremities do not receive sufficient heat. The toes, fingers, cheeks, and ears are the most commonly affected. Frostbite occurs when there is freezing of the fluids around the cells of the affected tissues. The first symptom of frostbite is an uncomfortable sensation of coldness, followed by numbness. There may be tingling, stinging, or cramping. Contact by the skin with tools or other metal objects below 20°F (-7 degrees Celsius) may result in contact frostbite.

Table 7: Cold Stress Monitoring

Condition	Stress	Treatment
Hypothermia Mild Body temperature (98°-90°F)	<ul style="list-style-type: none"> • Shivering • Lack of coordination • Stumbling, fumbling hands • Slurred speech • Memory loss • Pale, cold skin 	<ul style="list-style-type: none"> • Move to warm area • Stay active • Remove wet clothes and replace with dry clothes or blankets • Cover the head • Drink warm (not hot) sugary drink
Hypothermia Moderate Body temperature (90°-86°F)	<ul style="list-style-type: none"> • Shivering stops • Unable to walk or stand • Confused and irrational 	<ul style="list-style-type: none"> • Move to warm area • Stay active • Remove wet clothes and replace with dry clothes or blankets • Cover the head • Drink warm (not hot) sugary drink • Call for an ambulance • Cover all extremities completely • Place very warm objects, such as hot packs, or water bottles on the victim's head, neck, chest and groin
Hypothermia Severe Body temperature (86°-78°F)	<ul style="list-style-type: none"> • Severe muscle stiffness • Very sleepy or unconscious • Ice cold skin, death 	<ul style="list-style-type: none"> • Call for an ambulance • Treat the victim very gently • Do not attempt to re-warm the victim. The victim should receive treatment in the hospital

Condition	Stress	Treatment
Frostbite	<ul style="list-style-type: none"> • Cold, tingling, stinging or aching feeling in frostbitten area • Numbness • Skin color turns red, then purple, then white or very pale skin, cold to the touch • Blisters in severe cases 	<ul style="list-style-type: none"> • Seek medical attention • Do not rub the area • Wrap in soft cloth • If help is delayed, immerse in warm, not hot, water
Trench Foot	<ul style="list-style-type: none"> • Tingling, itching or burning sensation • Blisters 	<ul style="list-style-type: none"> • Soak feet in warm water, then wrap with dry cloth bandages • Drink a warm, sugary drink

9.3 OTHER WEATHER-RELATED HAZARDS

Other weather-related hazards that may take place during the site activities include heavy rains, damaging winds, thunderstorms, tornados, floods, wildfires, and lightning. Weather forecasts will be checked prior to site work each day on the National Oceanic and Atmospheric Administration website and will be monitored throughout the day by cell phone. If threatening weather conditions are predicted, the SSHO will determine if work can continue without endangering the health and safety of site personnel by using the following guidelines:

- Potential for lightning strikes
- Potential for heat or cold stress
- Limited visibility
- Inclement weather-related working conditions
- Roads becoming impassable

Outside work will be suspended during severe weather, including electrical storms. The SSHO will monitor storms and activate a lightning safety plan at the count of 30 seconds from the flash to the bang (6 miles away) and activities will not resume for 30 minutes from the last observed strike. This is called the 30:30 Rule. Personnel will seek shelter in the vehicles or a nearby building, as designated during the morning safety briefing.

10. Site Control Measures/Standard Operating Procedures

10.1 SITE CONTROL PLAN

10.1.1 Site Control

The site control plan for this project has been created in accordance with EM 385-1-1 Section 33.B.02.j (USACE 2014) and 29 CFR 1910.120(d)(1) *Site Control (General)* and (d)(2) *Site Control (Program)*; and 29 CFR 1926.65(d)(1) *HAZWOPER Site Control (General)* and (d)(2) *HAZWOPER Site Control (Program)*.

The area surrounding each sampling location poses physical hazards associated with the work. The purpose of site control measures is to minimize hazards to site personnel and to protect the public. To minimize hazards, a controlled work area will be established, which may be changed as needed according to the work or work schedule. Daily inspections of the work area(s) will be completed by the SSHO, who will have restricted access to the work areas. The extent of a work area will be sufficient to ensure that personnel located at or beyond its boundaries will not be affected in any substantial way by hazards associated with sample collection activities.

To meet this requirement, the following project-specific tasks will require the establishment of work zones as follows:

- *Underground Utility-Clearance Activities:* A minimum distance of 10 feet in all directions from the survey location.
- *Drilling Activities:* Determine the mast height of the drill rig. This height will be cleared, if practical, in all directions from the borehole location and designated as the exclusion zone (EZ). Subsurface soil sampling activities will be completed concurrently with the drilling, with subsurface soil samples collected directly from the core barrel. The mast must be lowered completely before moving the rig and during travel. Equipment will be a minimum distance of 50 feet from overhead utility lines, or greater where required by EM-385, Table 11-1 Minimum Clearance from Energized Overhead lines.
- *Groundwater Monitoring Well Installation and Development:* The area around the sampling location (i.e., groundwater monitoring well) will be sufficiently cleared to accommodate the groundwater sampling activities and the movement of the portable equipment to perform the activities.
- *Decontamination:* For decontamination of large equipment (e.g., vehicle and drilling equipment) 10 feet of clearance in all directions from the decontamination pad will be established, where practical. For personal and small parts decontamination conducted at the work location, decontamination activities are to be kept within the applicable EZ or contamination reduction zone (CRZ) established for that operation.

Work zones will be discussed during the daily safety meetings. Site-specific work zones will be established at each work area if required and will be established prior to work being conducted. If the site layout changes, a discussion of the new work zones and any related hazard issues will immediately follow once the changes are made. A site-specific example of the zone layout for this project site is presented on Figure 1.

There are three zones established for each work area:

- *EZ:* Contaminated work area
- *CRZ:* Decontamination area
- *Support Zone (SZ):* Contamination-free and exposure-free area, away from hazardous conditions

Each zone will be periodically monitored in accordance with the monitoring requirements established in this SSHP. The EZ and the CRZ are considered work areas. All personnel will be on the alert to prevent unauthorized, accidental entry into controlled-access areas such as the EZ, area of primary activities and CRZ, and area between the CRZ and the SZ. The SZ is an area where administrative and support activities occur and may be accessible to the public (e.g., vendors, inspectors). If there is unauthorized entry to a controlled-access area, then the trespasser must be immediately escorted outside the area or all HAZWOPER-related work must cease. For all personnel, equipment, and supplies that enter controlled-access areas, personnel must be decontaminated and equipment and supplies must be decontaminated or containerized as waste prior to exiting (through the CRZ only).

10.1.2 Work Area Control Records

Site controls are to be maintained so that only authorized personnel have access to work areas. The SSHO will record the identities of all personnel working in or entering the EZ each day. All site workers or visitors entering the EZ will be logged in and out on a daily basis.

10.1.3 Site Access

Site control procedures will be established to ensure site access by unauthorized personnel is limited. This will prevent persons who may be unaware of site conditions from being exposed to inherent hazards. Any unattended field equipment that could potentially cause injury will be removed from the site or otherwise rendered non-dangerous. The SSHO will be responsible for ensuring that the specific work areas are secure during nonworking hours.

10.1.4 Theft

Efforts will be made to secure equipment. If it is necessary to keep equipment inside a vehicle, the equipment will be stowed out of plain sight, and the vehicle will be secured (all vehicle doors locked and all windows closed). Personnel will secure vehicles, even if left unattended for only a brief period, and will carry vehicle keys with them at all times.

In the event that a theft occurs, local authorities will be promptly notified as well as the appropriate project team member.

10.1.5 Personal Confrontation

Personnel will be observant of their surroundings. To keep themselves and others safe, they will not confront or challenge aggressive perpetrators. Authorities should be contacted if they observe anything unusual or suspicious.

10.1.6 Buddy System

Work at the site will be performed using the buddy system. Team members will keep visual contact of their buddy at all times. Team members will keep each other informed of any physical and chemical hazards in their work area.

10.1.7 Site Communications

Site workers will be alerted to emergencies in accordance with APP Section i.2.

10.1.8 Medical Assistance

The nearest medical assistance and facility from the site and contact information for emergency services are provided in the APP Section i.2.

10.1.9 Pre-Entry Briefing

Prior to site entry, all site workers and visitors will be briefed on site health and safety hazards and response procedures.

10.1.10 Site Rules and Prohibitions

Personnel will use common sense, operate under the buddy system (or two-person rule), and follow safe work practices to mitigate hazards related to normal project activities. All general site safety procedures contained in the project field operating procedures guide will be followed.

June 2021

Final SSHP Supplemental Remedial Investigation
 Keyport OU 2, Area 8, Naval Base Kitsap, Keyport, WA

Page 27 of 38

Figure 1: Example Site Layout



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10.1.10.1 DESIGNATED EATING AND BREAK AREAS

Eating and break areas will be located away from the active work area. No food or drink will be allowed in any toxic work environments. Site workers must wash hands immediately after leaving controlled work areas (and always prior to eating, drinking, or smoking).

10.1.10.2 DESIGNATED SMOKING AREAS

Regulations governing approved areas for smoking and spark generation will be strictly followed. Smoking is prohibited in the work and fueling areas. Site workers must wash hands immediately after leaving controlled work areas (and always prior to eating, drinking, or smoking).

10.1.11 Work Permits

A Dig Permit will be obtained from Naval Base Kitsap Keyport prior to drilling activities. AECOM will ensure the identification of the location of utilities, and permits will be requested from and approved by the Navy, before AECOM commences drilling operations on the project site.

10.1.12 Material Handling Procedures

Work areas and access routes will be maintained safety and orderliness. Tools, materials, and materials shall be properly placed or put away and debris shall be removed or disposed of so as not to cause a tripping or other hazard. There will be no accumulation of combustible materials in storage and construction sites. There are no anticipated radioactive materials present on site. Spill contingencies are listed in Section 10.3.

10.1.13 Treatment Technology Employed at Site

Under the statement of work and activities anticipated for this tasking, there are no requirements for treatment.

10.1.14 Motor Vehicle Safety Plan

Safety is of utmost importance for the project team. Personnel must act responsibly every day to ensure their own safety and the safety of others. This commitment to safety also applies to the operation of vehicles. All drivers are required to operate vehicles safely and obey federal, state, and local laws and company policies. Driving is a privilege, not a right.

10.1.14.1 EMPLOYEE REQUIREMENTS AND RESPONSIBILITIES

Employees who are designated as drivers of project team vehicles must possess a current, valid driver's license of the appropriate class of vehicle. Drivers must operate the vehicle in a safe, legal, and professional manner. Project team personnel are to attend periodic defensive driving training and other driver safety meetings as scheduled through their local health and safety officers. Driver orientation program or driving evaluation tests may be required of drivers to assess overall driving skills.

Driving requires a high level of skill and alertness. When fatigue, illness, or medication impact alertness, reflexes, and decision-making capabilities, the operator should cease driving until the situation improves or is corrected and notify his or her manager of the situation.

Compliance with all federal, state, and local laws is expected. Unsafe vehicles and related equipment will be reported and repaired. Unsafe vehicles are not to be driven for project team business.

Compliance Issues and Driving Practices

Speed Limits

Drivers are required to obey posted speed limits and other traffic laws. Fines for any traffic violations are the driver's responsibility. Drivers not following traffic laws will be removed from the project team's driver list.

Seat Belts

Project team drivers and their passengers are required to wear seat belts at all times while the vehicle is in operation.

Distracted Driving

Distracted driving can contribute to accidents. Accordingly, project team personnel are to exercise caution and good judgment when driving. Reading maps, eating, placing or receiving a call, entering data (e.g., text, email, internet search) on a mobile phone, and other activities may contribute to an accident. Mobile phone use while driving, including the use of hands-free devices, is a distraction, leads to inattention, and is prohibited. The following basic guidelines should always be observed:

- Make outgoing calls, text messages, and emails after you have pulled over to a safe area.
- Let incoming calls go to voice mail.
- At all times, drivers are to operate vehicles in a safe, legal, and professional manner.

Transporting Weapons

Transporting weapons (such as firearms, large knives) or dangerous property (significant or placardable quantities of regulated hazardous materials or substances) is prohibited, unless specifically authorized.

10.2 SANITATION PLAN

See APP Section i.3 for the site sanitation plan for this project.

10.3 SPILL CONTAINMENT PLAN

This plan has been created in accordance with EM-385, Section 33.B.02 (USACE 2014) and 29 CFR 1910.120(b)(4)(ii)(J), 29 CFR 1910.120(J) *Handling Drums And Containers*, and 29 CFR 1926.65(b)(4)(ii)(J), 1926.65(J) (HAZWOPER) *Handling Drums And Containers*. The following procedures comprise the spill containment program in place for activities at the site. Spill procedures will be reviewed by the SSHO with team members.

10.3.1 Measures for Preventing Fuel Spills

- Care shall be taken when transferring fuels.
- A containment dike around fuel storage tanks shall be constructed.
- All fuel storage tanks and containment structures shall be inspected for leaks daily.

- Where spills, leaks, or ruptures may occur, adequate quantities of spill containment equipment (e.g., absorbent, pillow, shovels) will be stationed in the immediate area. The spill containment equipment must be sufficient to contain and isolate the entire volume of fuel being transferred.
- Fire-extinguishing equipment meeting 29 CFR Part 1926, Subpart F, shall be on hand and ready for use to control fires.

10.3.2 Fuel Spills Greater than Five Gallons

The following response procedures shall be followed for spills of flammable fuels greater than 5 gallons in volume:

- Shut down operation in area immediately.
- Limit ignition sources.
- Suppress vapors as required.
- Survey area with a combustible gas indicator if available; don protective equipment as necessary.
- Pump liquids into drums.
- Recover contaminated solids and place in containers.
- Clean up all residues.

10.3.3 Notification

In the event of a spill or release, project team personnel will immediately dial 911 and will then notify the SSHO or designee. The CTO manager and AECOM SHM will be informed of any injuries, minor or serious, and notification will be made in accordance with APP Section i.2. The SSHO will file an incident report within 24 hours of the accident. If property damage exceeds \$500,000, the incident will be reported in writing no later than within one hour to the Contracting Officer or Contracting Officer's Representative.

11. Decontamination

The following decontamination procedures for physical removal and neutralization of contaminants that adhere to equipment and personnel are designed to prevent cross-contamination of samples and contaminant migration to clean areas in accordance with in accordance with EM-385-1-1 Section 33.B.02.k-1 (USACE 2014) and AECOM SH&E SOPs S3AM-001-PR1, *Safe Work Standards & Rules*, S3AM-013-PR1, *Housekeeping*, and S3AM-305-ATT9, *Pressure Washer* (APP Appendix E). All necessary steps will be taken to reduce or minimize contact with chemicals and contaminated or impacted materials while performing field activities (e.g., avoid sitting or leaning on, walking through, dragging equipment over, tracking, etc. potential or known contaminated or impacted materials).

Before entering the site with equipment, decontamination station(s) will be set up in the CRZ, and all equipment will be cleaned to remove grease, oil, encrusted dirt, or other potential contaminants. All personnel performing decontamination will wear the appropriate PPE for a site location as protection against potential chemicals of concern associated with that site. Personal decontamination will be performed with an attendant (buddy) to assist with decontamination activities. Any person or equipment in the EZ is considered contaminated. Hence, when exiting the EZ, all persons and equipment must be properly decontaminated in the CRZ before entering the SZ. The location of the CRZ will be selected based on the following: the ability to control access to the CRZ area, the ability

to restrict access to the EZ area (i.e., the area being investigated), the ability to isolate residual material that is removed from the equipment, and the need to store clean equipment.

Decontamination procedures may vary based on site conditions and the nature of the contaminant(s). Equipment to be decontaminated at the conclusion of field work includes tools, monitoring equipment, sampling equipment and containers, trucks and rigs, and the decontamination equipment. If chemicals or decontamination solutions are used, care will be taken to minimize reactions between the solutions and contaminated materials. In addition, personnel must assess the potential exposure from decontamination chemical(s) or solutions. The applicable SDS must be reviewed, implemented, and filed by personnel that come into contact with the chemicals or solutions.

All contaminated PPE and decontamination materials will be containerized, stored, and disposed of in accordance with site-specific requirements determined by site management.

11.1 DECONTAMINATION EQUIPMENT

The equipment required to perform decontamination may vary based on site-specific conditions and the nature of the contaminant(s). The following equipment is commonly used for decontamination purposes:

- Soft-bristle scrub brushes or long-handled brushes to remove contaminants
- Hoses, buckets of water, or garden sprayers for rinsing
- Large plastic or galvanized wash tubs or children's wading pools for washing and rinsing solutions
- Large plastic garbage cans or similar containers lined with plastic bags for the storage of contaminated clothing and equipment
- Metal or plastic cans or drums for the temporary storage of contaminated liquids
- Paper or cloth towels for drying protective clothing and equipment

11.2 PPE DOFFING AND DONNING INFORMATION

The following are helpful tips for donning and doffing PPE in a safe and manageable way:

- Never cut disposable booties from your feet using a basic utility knife as that can cut through the bootie to the underlying leather work boot, resulting in significant cuts to the leg or ankle. Instead, using an AECOM-approved cutting tool, start a cut at the edge of the bootie, cut above and parallel with the work boot, then manually tear the material down to the sole of the bootie for easy removal.
- When applying duct tape to PPE interfaces (e.g., wrist, lower leg) and zippers, leave approximately 1 inch at the end of the tape and fold over onto itself. This will make it much easier to remove the tape, even with gloves on, by using the fold like a small handle. Otherwise, pulling out the tape with gloves would be difficult and could result in tearing the PPE.
- Have a buddy check your ensemble to ensure proper donning before entering controlled work areas. Without mirrors, the most obvious discrepancies can go unnoticed and may result in a potential exposure.
- Never perform personal decontamination using a pressure washer.

11.3 EQUIPMENT DECONTAMINATION

All equipment leaving the EZ are considered contaminated and must be properly decontaminated to minimize the potential for exposure and offsite migration of contaminants. Equipment includes but is not limited to: sampling tools, heavy equipment, vehicles, PPE, support devices (e.g., hoses, cylinders), and various handheld tools.

All personnel performing equipment decontamination will wear the appropriate PPE to protect against exposure to contaminated materials. The level of PPE for equipment decontamination may be equivalent to the level of PPE required in the EZ. Other PPE may include splash protection, such as face-shields, splash suits, and knee protectors. Following equipment decontamination, personnel may be required to undergo proper personal decontamination following procedures provided below.

For larger equipment (e.g., drill bits, augers, tremie pipes), decontamination will be accomplished by steam cleaning at pre-determined locations. The decontamination station(s) will be established during site preparation activities prior to drilling and will be placed at an adequate distance away and upwind from potential contaminant sources. Each decontamination station will consist of a series of buckets and containers set up on a visqueen-lined bermed area. Each item will be steam cleaned using a portable, high-pressure steam cleaner with a pressure hose and fitting in accordance with procedures outlined in AECOM SH&E SOP S3AM-305-ATT9, *Pressure Washer* (APP Appendix E). The decontamination fluids contained within the bermed area will be transferred to and stored in secured containers (i.e., 55-gallon drums).

Some contaminants require the use of a non-phosphate detergent or chemical solution and scrub brushes for proper decontamination.

For smaller equipment, follow these decontamination steps:

1. Remove as much of the visible gross contamination as possible in EZ.
2. Wash equipment in decontamination solution with a scrub brush and power-wash heavy equipment.
3. Rinse equipment.
4. Spray with laboratory-grade isopropyl alcohol.
5. Rinse with deionized or distilled water.
6. Visually inspect for remaining contamination.
7. Follow appropriate personal decontamination steps outlined as follows.

All decontaminated equipment will be visually inspected for contamination prior to leaving the CRZ. Signs of visible contamination may include an oily sheen, residue, or contaminated soils left on the equipment. All equipment with visible signs of contamination will either be discarded or decontaminated again until clean. Depending on the nature of the contaminant, equipment may be analyzed using a wipe method or other means.

11.4 PERSONAL DECONTAMINATION PROCEDURES

Most of the project tasks may be completed in Level D PPE. When there is the potential of personnel coming into dermal contact with hazardous materials or chemicals, personnel shall don the appropriate

gloves in addition to Level D attire. Procedures for personnel decontamination shall be followed, as necessary:

In the EZ:

1. Place equipment on plastic sheet.
2. Remove the majority of visible gross contamination from equipment, boots, and gloves.
3. Wash boot covers and outer gloves.
4. Rinse boot covers and outer gloves.
5. Remove tape.
6. Remove boot covers and outer gloves.

In the CRZ (keep the most contaminated equipment near the EZ boundary):

1. Wash protective suits and safety boots.
2. Rinse protective suits and safety boots.
3. Remove safety boots.
4. Remove protective suit.
5. Wash inner gloves.
6. Rinse inner gloves.
7. Remove inner gloves.
8. Remove inner clothing (if necessary).

In the SZ:

1. Finish decontamination and hygiene wash procedures.
2. Redress (if necessary).

AECOM SH&E SOP S3AM-001-PR1, *Safe Work Standards & Rules*, and AECOM SH&E SOP S3AM-013-PR1, *Housekeeping* (APP Appendix E), will be followed to minimize exposure to potential contaminants and to reduce the need for decontamination. Safe work practices include the following:

- Use caution while working around decontamination stations, including the decontamination pad, which is a slip or trip hazard.
- To avoid contacting potentially contaminated substances and surfaces, avoid kneeling or sitting on the ground, sitting on equipment, or placing equipment on potentially contaminated ground surfaces.
- Water down dusty areas.
- Replace PPE when it becomes heavily soiled or torn, or during extended personnel break periods.
- Use disposable sampling equipment.

11.4.1 Disposal of Decontamination Wastes

Solid and liquid decontamination waste will be containerized. Solids may be double bagged or placed in a sealed drum or similar container. Liquids will be collected during decontamination and placed in sealed containers. Containers must be clearly labeled with the type of waste content, the operation or process that generated the waste, and the dates of accumulation.

11.4.2 Monitoring Decontamination Effectiveness

The SSHO will monitor the effectiveness of the decontamination procedures.

12. Emergency Equipment and First Aid

12.1 EMERGENCY EQUIPMENT

Table 8 lists emergency equipment that will be maintained on site and available for use during site operations. Emergency equipment shall be maintained in proper working order and checked daily by the assigned personnel. It is the responsibility of the SSHO to maintain the site emergency equipment in good working order. The SSHO will inspect all emergency equipment at least weekly to ensure completeness and proper working condition. Any time that emergency equipment is used, it is to be reported to the SSHO so that the equipment is replaced immediately. Site operations will not be allowed to continue if the required emergency equipment is not immediately available on site.

Table 8: Emergency Equipment

Emergency Equipment	Quantity	Location	Operation Requiring Equipment
First aid Kit	1	Each Vehicle	All operations
Biohazard Kit	1	Each Vehicle	All operations
Portable Eye Wash Kit	1	Each Vehicle	All operations
Fire Extinguisher	1	Each Vehicle Applicable Field Operations	All operations

12.2 FIRST AID

A first aid kit will be provided on site that complies with the criteria contained in ANSI/ISEA Z308.1-2014. Trained personnel will use approved measures for treatment. For minor injuries, routine first aid procedures will be used. For major injuries, an ambulance will be called immediately, and the appropriate first aid administered while awaiting the arrival of the ambulance.

If a helicopter medical evacuation (MEDEVAC) is necessary for a medical emergency or trauma, the emergency action coordinator (EC) will ensure that the area is safe to enter; render first aid as necessary; and call 911, describe the event to the operator, and request MEDEVAC transport. The EC will monitor and direct the approaching helicopter to a safe landing location and will direct personnel away from the aircraft. The site will be secured until an accident investigation is conducted.

12.2.1 First Aid Kits

All field team vehicles will have an ANSI-approved first-aid kit in compliance with ANSI Z308.1-2015. Trained personnel shall use approved measures for treatment of minor injuries in accordance with the first-aid training that they received. For major injuries, an ambulance will be called immediately and appropriate first aid will be administered while awaiting the ambulance. The SSHO will designate a meeting location that is accessible to the emergency medical services for

emergency pickup. An individual who needs medical attention will be evaluated and, if determined to be stable enough, moved to a pickup location. Helicopter extraction may be needed in extreme cases.

12.2.2 Bloodborne Pathogens

Bloodborne pathogens are pathogenic microorganisms present in human blood that can cause disease in humans. These pathogens include, but are not limited to, Hepatitis B Virus, Hepatitis C Virus, and Human Immunodeficiency Virus. Personnel administering care must have successfully completed bloodborne pathogens training in accordance with Section 5 and must implement exposure control measures.

PPE is the first line of defense against bloodborne pathogens. The following protective equipment will be available on site for personnel's administering first aid:

- *Surgical Gloves*: Must be worn if there is the potential that the hand may come into contact with blood or other bodily fluids or the condition of the hand is compromised by non-intact skin areas.
- *Masks, Eye Protection, Face Shields*: Must be worn if there is the potential for blood or bodily fluids to contaminate the eyes, nose, or mouth.
- *Coveralls, Jacket*: Will be donned if there is the potential for blood or bodily fluids to contaminate the body.
- *Breathing barrier*: Should be worn when administering CPR to prevent blood or bodily fluid contamination.

To ensure that equipment is used effectively, personnel will adhere to the following practices when using PPE:

- Any garments penetrated by blood or other suspect infectious materials are to be removed immediately, or as soon as feasible.
- All personal protective clothing and equipment shall be removed prior to leaving the site and placed in a suitable container for decontamination and disposal.
- Disposable gloves that are contaminated, torn, punctured, or no longer effective as an "exposure barrier" are to be replaced as soon as is practical.
- Potential exposure to the body, as in certain cases where first aid is administered, will require that the administering personnel don a coat or coveralls for protection.

13. Emergency Planning

See APP Section i.2 and Section i.4 for emergency plans for this project.

Emergency response procedures will be rehearsed in order to evaluate the planned response capabilities at the site. The SSHO will respond to all emergencies, except when the emergency involves the SSHO, at which time a designee will assume responsibility. Appropriate individuals, authorities, and health-care facilities will be notified of the circumstances (e.g., status, site condition, response activities, and hazards) of the emergency.

To prepare for and in order to minimize the impact of an emergency, the SSHO will:

- Review emergency procedures with affected personnel.
- Ensure that the roster list of all AECOM and subcontractor personnel is updated daily.
- Ensure that an eyewash station, first aid supplies, and fire extinguishers are available at the site.
- Have working knowledge of all safety equipment available at the site.
- Ensure that a map detailing the most direct route to the hospital and all relevant telephone numbers are kept inside each site vehicle (APP Figure 5 and APP Table 10).

14. Pre-Entry Briefing

The SSHO will present daily site safety briefings to site personnel prior to the start of the work shift. The purpose of the briefings is to assist personnel with conducting their scheduled work activities safely. The briefings will include the following:

- Tasks to be performed
- Work method
- General description of job scope
- Work location
- Equipment usage
- Control of hazards
- Weather conditions
- Emergency response review
- Applicable PPE

The briefings provide an opportunity for individuals to communicate their thoughts or observations of safety deficiencies and propose corrective actions. Attendance at these daily safety briefings is mandatory for all field workers, including subcontractors, and will be documented by the SSHO.

Additionally, a tailgate safety briefing will be conducted and documented by each individual team, covering topics such as applicable safety hazards, precautionary measures, and mitigating measures for task-specific activities.

As discussed in Section 3, applicable project AHAs with RAC assigned for the project task and associated job steps have been discussed with all supervisors and site workers in a job pre-briefing prior to the start of site work.

15. Confined Space Entry and Site Excavations

15.1 CONFINED SPACE ENTRY

This section is not applicable because there are no known confined spaces at this site.

15.2 SITE EXCAVATIONS

This section is not applicable because no site excavation will be conducted at this site.

16. References

- Agency for Toxic Substances and Disease Registry (ATSDR). 2000. *Toxicological Profile for Toluene*. Atlanta, GA: U.S. Department of Health and Human Services, Public Health Service. September.
- . 2007a. *Toxicological Profile for Benzene*. Atlanta, GA: U.S. Department of Health and Human Services, Public Health Service. August.
- . 2007b. *Toxicological Profile for Xylenes*. Atlanta, GA: U.S. Department of Health and Human Services, Public Health Service. August.
- American Conference of Governmental Industrial Hygienists (ACGIH). 2014. *Threshold Limit Value (TLV) and Action Limit for Heat Stress Exposure*. <https://www.acgih.org/>.
- Department of the Navy (Navy). 2018. *Department of the Navy Environmental Restoration Program Manual*. Alexandria, VA: Naval Facilities Engineering Command. February.
- Department of Transportation, United States (DOT). 2013. *Effective Noise Control During Nighttime Construction*. Workshop conducted by the Office of Operations Federal Highway Administration (FHWA).
- United States Army Corps of Engineers (USACE). 2014. *Safety and Health Requirements Manual*. EM 385-1-1. Washington, DC: Department of the Army. November 30.

**Attachment A:
Safety Data Sheets
(included in field copy;
excluded from reviewer copy)**

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**Appendix E:
AECOM SH&E Standard Operating Procedures
(included in field copy;
excluded from reviewer copy)**

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000 SERIES - SH&E ESSENTIALS

S3AM-001-PR1 Safe Work Standards & Rules

S3AM-005-PR1 Driving

S3AM-013-PR1 Housekeeping

S3AM-014-PR1 Manual Lifting

100 SERIES - EXPOSURE MANAGEMENT

S3AM-111-PR1 Bloodborne Pathogens

S3AM-114-PR1 Compressed Gases

S3AM-115-PR1 Hazardous Materials Communication

S3AM-118-PR1 Hearing Conservation

S3AM-127-PR1 Exposure Monitoring

S3AM-128-PR1 Medical Screening & Surveillance

200 SERIES - PLANNING & OVERSIGHT

S3AM-208-PR1 Personal Protective Equipment

S3AM-214-PR1 International Travel

300 SERIES - FIELD

S3AM-305-PR1 Hand & Power Tools

S3AM-305-ATT9 Pressure Washer

S3AM-309-PR1 Heavy Equipment

S3AM-313-PR1 Wildlife, Plants & Insects

S3AM-321-PR1 Drilling, Boring & Direct Push Probing

Americas

Safe Work Standards & Rules

S3AM-001-PR1

1.0 Purpose and Scope

- 1.1 Demonstrates AECOM's commitment to the establishment and maintenance of workplaces free from recognized hazards.
- 1.2 This procedure applies to all AECOM Americas based employees and operations and any other entity and its personnel contractually required to comply with this document's content..

2.0 Terms and Definitions

- 2.1 **Safety Violation** – Not following verbal or written safety policies, rules and procedures (e.g., horse play, failure to wear selected PPE, abuse of selected PPE, etc.).
- 2.2 **Safe Work Practices** – Safe work practices are generally written methods outlining the requirements associated with how to perform a task with minimum risk to people, equipment, materials, environment, and processes.
- 2.3 **Safe Job Procedures** – Written step-by-step set of instructions about completing a specific task safely including control measures and responding to emergency situations.
- 2.4 **SH&E Plan** - A written, reviewed, and approved plan for how the required work will be completed in a safe manner (may also be known as a Safety Plan, Safe Work Plan, Health and Safety Plan, Accident Prevention Plan, etc.).

3.0 References

- 3.1 AECOM Employee Handbook

4.0 Procedure

- 4.1 Roles and Responsibilities
 - 4.1.1 **Managers and Supervisors**
 - Confirm compliance with all procedures and governmental requirements, and will be held responsible to prevent or bring any violations to the attention of the appropriate level of Management for corrective actions as per AECOM HR policies.
 - Confirm implementation of, and compliance with, this procedure.
 - 4.1.2 **SH&E Managers**
 - Provide guidance as to safe work standards, rules, requirements and guidelines.
 - 4.1.3 **Human Resource Managers**
 - Provide guidance and direction to managers and supervisors implementing the disciplinary process for safety violations (as defined in the Employee Handbook).
 - 4.1.4 **Employees**
 - Responsible for adhering to all AECOM safe work standards, rules, requirements and instructions and to provide input as appropriate.
- 4.2 Safety, Health & Environment (SH&E) Procedures
 - 4.2.1 Safe work practices and safe job procedures are embodied in AECOM's SH&E Procedures and are available on the AECOM SH&E website.



4.2.2 Specific safe work practices and safe job procedures have been developed in conjunction with employees and with particular input from those who have significant experience.

4.2.3 AECOM SH&E Procedures have been developed to provide clear instruction regarding the safety and reporting requirements of staff and operations.

4.3 Inspections and Audits

4.3.1 The Manager directing activities of the facility, site, or project location shall conduct project audits and office inspections to identify safe work practices and potential safety violations.

4.4 Any employee who willfully disregards AECOM or client safety standards, rules or requirements is subject to disciplinary action.

4.4.1 Disciplinary action will be documented in accordance with AECOM Human Resources policy.

5.0 Records

None

6.0 Attachments

6.1 [S3AM-001-ATT1](#) [Safety Rules](#)

Americas

Driving

S3AM-005-PR1

1.0 Purpose and Scope

- 1.1 The purpose of this document is to establish policies and procedures for operation of AECOM-owned, rented, or leased vehicles, client or customer-owned vehicles, and personal vehicles used by AECOM employees.
- 1.2 This procedure applies to all AECOM Americas-based employees and operations and any other entity and its personnel contractually required to comply with this document's content. Policies and procedures related to the operation of commercial motor vehicles are in addition to this procedure; refer to *S3AM-320-PR1 Commercial Motor Vehicles*.

2.0 Terms and Definitions

- 2.1 **AECOM Business** – Any activity that is performed in the name of AECOM. This includes, but is not limited to, vehicle travel between work locations, client sites, meeting locations as well as driving performed as a part of work-related travel (e.g., driving to and from airports, hotels, train stations). AECOM business does not include driving that is a part of a daily routine commute from home to an AECOM location.
- 2.2 **Authorized Driver** – AECOM employees who receive manager approval following evaluation of driver criteria to drive and maintain an AECOM-owned, leased or rented vehicle, a client or customer-owned vehicle, or a personal vehicle operated in the course of conducting AECOM business. Authorized Drivers shall maintain a current driver's license with full privileges applicable to the vehicle to be operated. There are three categories of Authorized Drivers;
 - Professional (AECOM employee who operates a commercial motor vehicle. Please refer to *S3AM-320-PR1 Commercial Motor Vehicles*).
 - Hired (Employee's specific AECOM role is to drive employees in a normal street vehicle, which may or may not require commercial licensing by the applicable authorities. This category does not include busses or vans with a capacity of more than 12 people.).
 - General (Driving is required as a part of the employee's job duties. This includes driving AECOM-owned, leased, or rented vehicles, client or customer-owned vehicles, or personal vehicles on AECOM business).
- 2.3 **Collision** – Any incident in which a motor vehicle that (whether in motion, temporarily stopped, or parked) makes contact with another vehicle or pedestrian, or results in property damage and/or bodily injury, regardless of who was injured, what property was damaged, or who was responsible.
- 2.4 **Commercial Motor Vehicle (CMV)** – Any self-propelled or towed motor vehicle used for AECOM business (e.g., to transport passengers or property) when the vehicle is one of the following:
 - Has a gross vehicle weight rating (GVWR) or gross combination weight rating equal to or greater than the weight specified by the applicable jurisdiction (e.g., U.S. ≥ 10,001 pounds [4,536 kilograms]); or
 - Is designed or used to transport more than the number of passengers specified by the applicable jurisdiction, including the driver, for compensation; or
 - Is designed or used to transport more than the number of passengers specified by the applicable jurisdiction, including the driver, and is not used to transport passengers for compensation; or
 - Is used in transporting hazardous material in quantities ≥ 1,001 pounds (454 kilograms) combined total weight at any time.
 - Refer to *S3AM-320-PR1 Commercial Motor Vehicles* for additional information.

- 2.5 **Distracted Driving** – An activity that takes the driver’s attention away from the primary task of driving.
- 2.6 **Driving Under the Influence (DUI)/Driving While Intoxicated (DWI)** – The operation of a vehicle while under the influence of alcohol, drugs, medications, or other substances capable of inducing an altered mental state and/or impairing physical and mental judgments, such that the influence of the substances produces impairment in violation of the applicable governmental laws.
- 2.7 **Fatigue** – A general term used to describe the experience of being “sleepy”, “tired” or “exhausted”. The effect of fatigue is both physiological and psychological and can severely impair a driver’s judgement. Fatigue can cause lapses in concentration which could prove fatal. Fatigue is not just a problem for drivers on long trips, as drivers can also suffer from fatigue on short trips.
- 2.8 **Incident** – For the purposes of this procedure, a vehicle collision or other event where personal injury or property damage occurs, or where a citation is issued while the employee is on AECOM business. This may also include acts of theft, vandalism, and criminal mischief.
- 2.9 **Journey Management** – A process for planning and executing necessary journeys safely.
- 2.10 **Local Laws** – Signs, postings, laws, regulations, ordinances and codes applicable for the jurisdiction in which the motor vehicle is being operated.
- 2.11 **Motor Vehicle Report (MVR) / Driver’s Abstract** – A listing of the tickets (violations), incidents collision for an individual driver over a period of time (e.g., 3 years, 5 years) provided by a state or provincial authority such as the Department of Motor Vehicles.
- 2.12 **Personal Vehicle** – A motorized vehicle owned or leased by an employee.
- 2.13 **Portable Electronic Device** – A mobile electronic device that is used to receive or communicate voice, email, internet, and/or public media. The device requires user interaction (typing, dialing, reading, keying, etc.) that distracts the motor vehicle operator. Example devices include, but are not limited to:
- Mobile Communication Devices (MCD)
 - Mobile/Cellular phones
 - Two-way Radios
 - Personal Data Assistant (PDA)
 - iPads, iPods, or other tablet models
 - Computers
 - Global Positioning System (GPS) receivers
- 2.14 **Spotters** – Extra personnel that may provide guidance when maneuvering in close and/or complex situations in order to avoid the occurrence of an incident.
- 2.15 **Task Hazard Analysis (THA)** – A tool for evaluating work activities for the purpose of:
- Identifying the SH&E hazards and risks associated with the activity being performed;
 - Identifying and implementing control measures to eliminate or reduce hazards and risks; and,
 - Evaluating the effectiveness of control measures and making modifications as needed.

3.0 References

- 3.1 AECOM Global Travel Policy
- 3.2 RS2-001-PR Firearms Standard
- 3.3 S3AM-003-PR1 SH&E Training
- 3.4 S3AM-004-PR1 Incident Reporting, Notifications & Investigation
- 3.5 S3AM-009-PR1 Fatigue Management
- 3.6 S3AM-010-PR1 Emergency Response Planning

Driving (S3AM-005-PR1)
Revision 10 July 31, 2019

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2 of 12

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- 3.7 S3AM-209-PR1 Risk Assessment & Management
- 3.8 S3AM-314-PR1 Working Alone
- 3.9 S3AM-319-PR1 All-Terrain Vehicles
- 3.10 S3AM-320-PR1 Commercial Motor Vehicles

4.0 Procedure

4.1 Roles and Responsibilities

4.1.1 Manager / Supervisor

- Confirming employees are informed of the provisions of this procedure and related vehicle procedures.
- Providing a copy of this procedure to an employee who will be driving an AECOM-owned, leased or personal vehicle for AECOM business.
- Allowing employees to designate time to complete required driving safety training, vehicle inspections and related activities.
- Assigning driving tasks to authorized employees only.
- Selecting and providing vehicles for use by authorized employees that are appropriate for the planned working conditions and environment.
- Supporting employees in the reporting of vehicle incidents per *S3AM-004-PR1 Incident Reporting, Notifications & Investigations*, including the entry of the incident into the on-line incident management system (e.g., IndustrySafe).
- Confirm notification of AECOM Human Resources and Counsel upon receipt by an employee of a legal summons associated with a moving violation related to the use of a company vehicle.

4.1.2 Employee

- Follow this procedure and applicable laws while operating a vehicle.
- Complete assigned driver safety training based on the training matrix and any additional training assessments developed at the business group. Refer to *S3AM-003-PR1 SH&E Training, including S3AM-003-FM1 SH&E Training Matrix*.
- Report to the Manager / Supervisor if the vehicle selected is not appropriate for the working conditions and environment.
- Report to the Manager / Supervisor if the employee is inexperienced in operating the type of vehicle assigned.
- Report to the Manager / Supervisor if the employee is inexperienced in driving in the type of working conditions and environment assigned.
- Review the completed Task Hazard Assessment and complete journey management. If required, document the Journey Management Plan using *S3AM-005-FM1 Journey Management Plan* or equivalent.
- Immediately report vehicle incidents per *S3AM-004-PR1 Incident Reporting, Notifications & Investigations*, including the entry of the incident into the on-line incident management system (e.g., IndustrySafe).
- Notify the appropriate Manager / Supervisor and SH&E Manager upon receipt of a legal summons associated with a moving violation related to the use of a company vehicle.
- Immediately report a change or limitation(s) to his/her Driver's License to the appropriate AECOM Human Resources representative or his/her Manager / Supervisor.

Driving (S3AM-005-PR1)
Revision 10 July 31, 2019

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3 of 12

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- Conducting a pre-operational inspection of the vehicle for damage or deficiencies and reporting discovered deficiencies affecting the safe operation of the motor vehicle to the appropriate authority (e.g., supervisor, rental car agency, etc.).

4.1.3 SH&E Manager

- Maintaining and updating training resources for vehicle and driver safety.
- Providing guidance.
- Assisting operational leaders with determining the risk incurred by the use of motor vehicles.
- Assist in the incident investigation and review process.

4.2 General Procedures and Practices

- 4.2.1 Only Authorized Drivers are to operate a motor vehicle (rental, personal, client or customer-owned, or AECOM-owned/leased) while on AECOM business.
- 4.2.2 Drivers must comply with AECOM's *Global Travel Policy* and applicable laws, and employ safe driving practices. (NOTE: *Individual state, provincial, and local laws vary.*) Refer to S3AM-005-ATT1 *Authorized Driver Safety Practices*.
- 4.2.3 Authorized Drivers shall confirm their operating license is on their person, and valid registration and insurance is maintained with the respective vehicle prior to operation.
- 4.2.4 All local laws including, signs, postings, regulations, ordinances, and codes applicable for the jurisdiction in which the motor vehicle is being operated shall be adhered to.
- 4.2.5 At-risk driving behavior by AECOM employees shall be identified and managed accordingly.
- 4.2.6 Authorized Drivers must be at least 18 years of age (noncommercial license) or 21 years of age (commercial license) and have a current driver's license for the appropriate class of vehicle (unless more stringent requirements are established by the leasing/renting agency). Employees with conditional licenses are prohibited from operating vehicles on AECOM business.
- 4.2.7 If an Authorized Driver receives a citation resulting in their license being suspended, has his/her driver's license revoked, or is otherwise unauthorized to drive, he/she shall notify the appropriate AECOM Human Resources representative or his/her Manager prior to start of the following work day. Failure to do this may result in disciplinary action up to and including termination.
- 4.2.8 The office to which the vehicles are registered is liable for any damages to the vehicle being operated by an Authorized Driver.
- 4.2.9 Seat belts are to be worn by the occupants. The number of passengers shall not exceed the manufacturer's specifications for the vehicle.
- 4.2.10 The vehicle may not move until all passengers have fastened their restraints in the proper manner (e.g., lap belt secured and shoulder harness placed over the shoulder). Vehicles are not to be operated or used by AECOM employees if seatbelts are not included as part of the vehicle's safety equipment.
- 4.2.11 The vehicle's engine is to be turned off during refueling. Smoking or cellular phone use is not allowed while refueling.
- 4.2.12 Motorcycles may not be operated on AECOM business unless the following requirements are met:
- Specific approval is provided by the Supervisor with concurrence from the SH&E Manager.
 - A hazard analysis is completed.
 - Required training and license is in place.
 - Headlights or daytime running lights will be used when the vehicle is in operation.
 - A Class 2 or 3 safety vest and appropriate helmet shall be worn while operating a motorcycle.

- 4.2.13 When practical, drivers should travel during daylight hours and avoid driving during adverse weather conditions. Drivers should also inform colleagues of their travel itinerary including destination and anticipated departure and arrival times.
 - 4.2.14 Fire arms and weapons are not permitted in AECOM-owned, leased or rented vehicles insured by AECOM. Firearms and weapons in personal vehicles are subject to the laws and regulations of the respective local, provincial, state, territory, federal and region and/or country. Refer to the *RS2-001-PR1 Firearms Standard*.
 - Exceptions to this standard may exist where there is a credible and demonstrated risk to AECOM employees or assets, or when knives or weapons are required as part of the work activity. Under such circumstances, the exception must be approved by the Chief Resilience Officer, and must strictly adhere to the procedures set forth by the Global Resilience Group.
 - 4.2.15 Vehicles are to be selected based on the nature of planned use. In some working conditions, specialized vehicles, such as four-wheel drive and higher clearance vehicle, may be required to confirm safe travel. These specialized vehicle requirements/specifications shall be identified in the project specific SH&E Plan and/or THA.
 - 4.2.16 Vehicles are to be maintained according to manufacturer's specifications and the applicable environmental and operating factors (e.g. winterized with appropriate fluids, winter tires installed, appropriate coolant for hot climates, etc.).
 - 4.2.17 Vehicles are to be outfitted with the appropriate support equipment based on the THA or client vehicle specifications. Support equipment may include, but is not limited to, cones, rotating warning lights, warning flags, vehicle identification (magnetic door signs or similar), wheel chocks, cargo nets, and rollover protection.
 - 4.2.18 Drivers are to operate vehicles in a manner that avoids situations where backing is necessary. Whenever possible and as permitted, reverse parking of all vehicles while on business is required. A spotter shall be used when backing of trucks and heavy equipment presents a risk of collision.
 - 4.2.19 Non-AECOM drivers (those other than AECOM employees [e.g., subcontractors, joint venture partners, clients, etc.]) are prohibited from operating an AECOM company owned, leased or rented vehicle unless the activity is specifically agreed to in the applicable contract and only if the use of the vehicle is consistent with the terms of the contract.
 - 4.2.20 Authorized drivers required to operate vehicles with special hazards (e.g., trucks carrying fuel cells, vehicles used to tow trailers, vehicles with limited visibility, etc.) will be thoroughly briefed on the hazards and control measures necessary for safe operation of the vehicle. The local AECOM operation will maintain documentation of the briefing.
 - 4.2.21 Define specific vehicle travel routes and parking areas at field sites through the use of fencing, cones, or other markings.
 - 4.2.22 When a vehicle will be left unattended without an authorized driver in the driver's seat, the vehicle must be turned off, placed into park (or gear for manual transmissions), and the emergency brake set. When parked on a grade, the wheels or tracks of mobile equipment shall be either chocked or turned into a bank.
- 4.3 Distracted Driving
- 4.3.1 Distractions while driving are a major cause of incidents. Distractions include the use of cellular phones (including texting), eating, drinking, smoking, and engaging in intense conversations. AECOM Authorized Drivers must exercise proper control of the vehicle at all times, including the management of possibly distracting actions and behaviors.
 - 4.3.2 The use of portable electronic devices that may distract the driver while driving is prohibited. This includes cell phones, two-way radios and other items whether hand-held or hands-free. Electronic devices include, but are not limited to, all mobile phones pagers, iPods, MP3s, GPS units, DVD players, tablets laptops and other portable electronic devices that can cause driver distraction.

- Employees shall not use a personal or company mobile communication devices (MCD) while driving any vehicle on AECOM business.
 - Employees shall not use a company MCD while driving a personal vehicle.
 - Driving includes the time spent in traffic or while stopped at red lights or stop signs.
- 4.3.3 GPS units and devices (e.g., smart phones, tablets) used for navigation may only be used if factory installed or secured to the vehicle with a bracket that allows the driver to view the image without having to take their eyes off the road. Note: windshield mounting brackets are not permitted in many jurisdictions, with dashboard mounts being acceptable. Consult jurisdictional requirements.
- 4.3.4 Electronic devices shall be setup for operation prior to commencing driving activities and shall not be changed by the driver while driving.
- 4.4 Impairment
- 4.4.1 Impairment can take many forms ranging from fatigue, to the use of prescription medication or alcohol (even small amounts), to the abuse use of illegal and legal drugs and alcohol. AECOM employees shall not drive in an impaired condition.
- 4.4.2 AECOM employees are prohibited from being under the influence of alcohol or drugs or improperly using medication in a way that could diminish, or raise questions concerning, an employee's ability to perform at his or her best while performing services for or on behalf of AECOM. Operation of vehicles while under the influence may void insurance coverage.
- 4.4.3 Drivers/operators will not drive or operate vehicles while under the influence of medications when told by a physician, another healthcare provider, or the manufacturer (e.g., instructions on the label) the medication could render the activity unsafe.
- 4.4.4 AECOM employees are prohibited from operating a vehicle if they are experiencing signs and symptoms of fatigue. Employees should stop work and rest before driving. No employee should operate a vehicle if they have worked 14 consecutive hours within a 24 hour period. Refer to *S3AM-009-PR1 Fatigue Management*.
- 4.5 Journey Management
- 4.5.1 When practical, alternatives to road travel should be evaluated including teleconferencing/video conferencing, the use of public transportation or carpooling.
- 4.5.2 Journey management is a process for planning and executing necessary journeys safely and may or may not be documented. Review the completed THA and complete the journey management process. If required, document a Journey Management Plan (JMP) using *S3AM-005-FM1 Journey Management Plan* or equivalent. The journey management process includes the following steps:
- Determining if the trip is necessary.
 - Evaluating alternative safer modes of transport.
 - Evaluating the potential to combine journeys with others.
 - Planning the trip.
 - Select the safest and most efficient route. Confirm compliance with any site specific specified routes, route rules, or restrictions.
 - Confirm route planning factors in fatigue management. Refer to *S3AM-009-PR1 Fatigue Management*.
 - Review road conditions and potential hazards associated with the route.
 - Review weather conditions and forecast.
 - If applicable, review *S3AM-314-PR1 Working Alone*.
 - Confirm Emergency Response Plan includes procedures to be taken in the event of a collision or vehicle incident.
 - Allow for adequate travel time.
 - Inform others of destination, estimated time of arrival and routing.

Driving (S3AM-005-PR1)
Revision 10 July 31, 2019

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6 of 12

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- 4.5.3 Drivers who are to undertake trips in excess of 250 miles (400 km) each way, drive in remote or hazardous areas, or when otherwise deemed necessary, shall develop and document a JMP. This plan typically includes the route, location of route hazards, timing, rest periods and locations, communications, emergency response and security arrangements.
- 4.5.4 Drivers are responsible for developing the JMP and coordinating with the applicable parties identified in the plan.

4.6 Driver Safety Training

Authorized drivers shall have a current driver's license for the appropriate class of vehicle (unless more stringent requirements are established by the leasing/renting agency).

Driver safety training is to be assigned based on the risks posed with the work environment, driver type and vehicle type, using the training matrix and any additional training assessments developed at the business group level. Refer to *S3AM-003-PR1 SH&E Training, including S3AM-003-FM1 SH&E Training Matrix*. A determination of training type is at the discretion of the Manager / Supervisor, with the following guidance applied.

- 4.6.1 All Authorized Drivers (Professional, Hired, and General Drivers) shall be trained in this procedure; *S3AM-005-PR1 Driving*.
- 4.6.2 All Authorized Professional Drivers shall be trained in *S3AM-320-PR1 Commercial Motor Vehicles*.
- 4.6.3 Vehicle / Driver Safety Training
 - Recommended for all employees who drive on behalf of AECOM (Professional, Hired and General Drivers).
 - This may be completed online (e.g., AECOM University – Driver Safety).
 - Recommended to be completed within 1 month of the Authorized Driver's hire date.
- 4.6.4 Defensive Driver (online) Training
 - Recommended for all Authorized Drivers (Professional, Hired, and General Drivers) who are assigned an AECOM company owned, leased or rented vehicle for a significant period of time with the expectation that the employee utilizes the vehicle on a regular basis for AECOM business.
 - It is recommended that authorized drivers who have completed web-based defensive driver training or equivalent also complete a refresher every three years.
 - Defensive Driver training is available online through AECOM University (e.g., Alert Driving Basic, Alert Driving Skills) or one of the following AECOM-approved training resources:
 - The National Safety Council
 - Alert Driving
- 4.6.5 Defensive Driver (hands-on) Training
 - Recommended for all Authorized Professional Drivers and Authorized Hired Drivers.
 - Recommended for Authorized General Drivers who drive in remote locations, hazardous environments (such as refineries, ports, terminals etc.), at-risk drivers, and when required by clients.
 - Defensive Driver hands-on training is provided through an AECOM-approved training resource, such as Smith Systems.
 - Hands on defensive driver training may be required as a result of an incident or negative Motor Vehicle Report.
- 4.6.6 Driver Retraining
 - Drivers involved in repeated motor vehicle incidents, incidents of sufficient severity or concern, or drivers identified as at-risk through review of their Motor Vehicle Report/Driver Abstract may

be retrained or, as applicable, subject to disciplinary action and refused the right to drive on behalf of AECOM.

- Retraining programs will be implemented at the discretion of the Supervisor and SH&E Manager.
- Employees eligible to continue driving shall be subject to a driver retraining program that may include any of the above programs or other training programs appropriate for the type of driving the employees performs.

4.6.7 Special Vehicles and Driving Conditions

- Vehicles such as All-Terrain Vehicles (ATVs), four wheel drive vehicles, motorized carts, snowmobiles, box vans and trailers (towing) require specialized training and supervision. For ATVs, Refer to *S3AM-319-PR1 All-Terrain Vehicles* for additional information.
- Use of these types of vehicles is limited to AECOM projects, therefore training and qualification programs for drivers will be project specific. The Manager / Supervisor shall work with the SH&E Manager to tailor training to the specific needs of the project.

4.7 Personal Vehicles (additional requirements)

- 4.7.1 The requirements of this procedure apply to the use of a personal vehicle for AECOM business. Additional requirements are set forth in the *AECOM Global Travel Policy*.
- 4.7.2 Personal vehicles driven by Authorized Drivers for business use must satisfy the jurisdiction's registration and inspection requirements and may not be modified beyond manufacturer's specifications.

4.8 Rental Vehicles (additional requirements)

- 4.8.1 The requirements of this procedure apply to the use of a rental vehicle for AECOM business. Additional requirements are set forth in the *AECOM Global Travel Policy*.

4.9 Requirements for Authorized Drivers

- 4.9.1 Review the *S3AM-005-ATT1 Authorized Driver Safety Practices* for specifics.
- 4.9.2 Drivers are not to permit unauthorized persons to operate an AECOM-owned/leased/rented vehicle.
- 4.9.3 All Authorized Drivers shall perform a walk-around inspection of the vehicle prior to operation.
- 4.9.4 Pre-operation vehicle inspections shall be performed and documented by all Authorized Professional Drivers and all Authorized Hired Drivers. A sample vehicle inspection checklist is provided in *S3AM-005-FM2 Vehicle Inspection Checklist*.
- 4.9.5 Vehicles with deficiencies that affect or could potentially affect the safe operation of the vehicle shall be removed from service and promptly repaired as necessary to permit safe vehicle operation.
- 4.9.6 As applicable, arrange for and/or coordinate with appropriate AECOM personnel to facilitate preventive maintenance services for the vehicle. Maintain it in sound mechanical condition, as per the manufacturer's recommendations provided in the owner's manual.
- 4.9.7 Do not operate the vehicle if unsafe maintenance conditions exist that would likely result in vehicle damage or personal injury. This applies to vehicles owned or leased by AECOM and to personally-owned vehicles used for AECOM business. Escalate other maintenance issues for correction to appropriate authority (e.g., manager, rental car agency, supervisor, etc.).
- 4.9.8 Transport only persons on AECOM related business or those persons receiving transportation as a prescribed service. Only drive vehicles in conditions for which the driver has the appropriate training and experience.
- 4.9.9 AECOM-owned, rented, or leased vehicles are for official business use only and are not to be used for personal activities. Exceptions to this requirement can be made only with the specific written approval of the Manager of the office or location the vehicle is registered to.

Driving (S3AM-005-PR1)
Revision 10 July 31, 2019

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8 of 12

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- 4.9.10 Smoking (including the use of e-cigarettes) and chewing tobacco is not permitted in AECOM-owned, leased or rented vehicles.
- 4.9.11 Drivers are responsible for damage caused by abuse of the vehicle.
- 4.9.12 Secure the vehicle when left unattended.
- 4.9.13 Securing loads in the inside and outside compartments of the vehicle.
 - Do not rely on weight/shape of load alone. Always use a cargo net, straps, containers or other mechanical device when necessary to confirm load is secure.
 - Mark loads that extend the beyond the end of truck, trailer or similar edge with a red warning flag of at least 16 square inches.
 - Red lights will be utilized at night to mark loads that extend the beyond the end of truck, trailer or similar edge.
- 4.9.14 Do not modify existing equipment (warning sounds, backing alarms etc.) or install aftermarket equipment including toolboxes, truck caps, specialty lights, or towing equipment) without approval from the Manager of the office or location the vehicle is registered to and AECOM Procurement Department.
- 4.10 Emergency Preparedness
 - 4.10.1 AECOM-owned or leased vehicles are to have a "Safety Kit" that contains a first-aid kit, portable fire extinguisher, safety triangle, and two reflective safety vests. If not available, contact the Manager / Supervisor or SH&E Manager to determine how to obtain a kit.
 - 4.10.2 The following suggested items should be kept in vehicles used for AECOM business in remote project locations:
 - First aid kit, appropriate to the work and crew size, or per regulations.
 - Fire extinguisher, safety triangle, and safety vest.
 - Emergency equipment (e.g., flares, flashlight, blanket, drinking water, etc.) based on conditions.
 - Means of communication (cell phone, radio or satellite phone), extra batteries or a charger.
 - 4.10.3 To the extent possible, employees should refrain from changing tires or making repairs to vehicles in the field.
 - A road side assistance service should be identified for vehicles used for AECOM business in advance travel.
 - If changing tires or making repairs to vehicles is necessary in the field, assessment of hazards shall be completed and all applicable safe procedures and manufacturer's specifications shall be followed.
 - 4.10.4 Specific emergency procedures are to be identified in the applicable Emergency Response Plan, JMP or the THA. Refer to *S3AM-010-PR1 Emergency Response Planning*.
- 4.11 Vehicle Incidents
 - 4.11.1 Vehicle incidents are to be reported and managed in accordance with *S3AM-004-PR1 Incident Reporting, Notifications and Investigation* regardless of how minor the incident might be.
 - 4.11.2 The Employee(s) involved in a collision shall follow the below guidelines:
 - Assess the situation to confirm everyone is safe, and remove any vehicle occupants from harm's way. Call, or have someone else call 911 immediately, if necessary.
 - As appropriate, remain at the scene of a collision to contact the police. Ask another motorist to call the police if necessary; never leave the scene of a collision.

- As applicable, provide (if requested) to police and the other driver(s) the liability insurance information. Obtain the officer's jurisdiction, name, and badge number and a copy of the police report.
 - As applicable, consider moving the vehicle out of the traffic flow if it is safe to do so, the vehicle is operational, and/or no further damage to the vehicle can occur.
 - Do not operate a damaged vehicle if its safety is questionable, its operating condition is illegal by applicable laws or its condition is such that further damage would likely result from its operation.
 - Turn on the vehicle's flashers to warn other motorists.
 - Obtain:
 - Names, phone numbers, and addresses of owner(s), driver(s), and occupants of the other car(s) involved.
 - Other party's insurance company's name, address, phone number, policy number, and insurance agent.
 - Names, phone numbers, and addresses of all witnesses.
 - Photographs of the accident scene when safe to do so.
 - Cooperate with AECOM Counsel if the incident results in unresolved risks or third party claims, or if the employee receives a summons, complaint or other legal documents relating to a traffic incident.
 - **DO NOT ADMIT LIABILITY, AGREE TO PAY FOR DAMAGE OR SIGN A DOCUMENT RELATED TO AN INCIDENT EXCEPT AS REQUIRED BY LAW.**
 - Statements made in haste or anger may be legally damaging.
 - If contacted by a third party, do not answer any questions. Immediately report this contact to the Manager / Supervisor and/or Legal Counsel
 - Employees shall report the incident to AECOM's Global Travel Department. If the incident involved a third party, the driver is responsible for obtaining a copy of the police report and providing to global travel
- 4.11.3 Employees must cooperate with the incident investigation team during any investigation of an incident meeting the investigation protocol.
- 4.11.4 Vehicle repairs shall be conducted at the authorization of the Manager / Supervisor.
- 4.12 Drug and Alcohol Testing
- 4.12.1 Testing for Alcohol and/or Drugs procedures shall be administered in accordance with the applicable policy and procedures. Refer to *S3AM-019-PR1 Substance Abuse Prevention*.
- 4.12.2 In the event that a police/regulatory officer responding to a vehicle incident administers field and/or laboratory impairment testing AECOM reserves the right, as permitted, to obtain copies of such testing results for inclusion in the incident report and consideration in a subsequent incident investigation.
- 4.13 Driving Privileges, Citations and Violations
- 4.13.1 A violation of this vehicle safety standard is subject review by the appropriate AECOM Human Resources representative and may be subject to disciplinary action, up to and including termination. The applicable Manager / Supervisor will review all incidents involving AECOM-owned, rented, or leased vehicles.
- 4.13.2 Citations and violations which occur while driving for AECOM business are to be reported as a vehicle incident in accordance with *S3AM-004-PR1 Incident Reporting, Notification & Investigation* within 24-hours. Incidents will be investigated as appropriate.
- 4.13.3 The AECOM Manager responsible for the employee, in consultation with the appropriate AECOM Human Resources representative, may suspend the privilege to operate vehicles on AECOM business due to noncompliance with the AECOM Vehicle and Driver Safety Program, involvement

in a motor vehicle incident, or resulting citations or other legal actions associated with motor vehicle violations.

4.13.4 The employee's driving privileges will be suspended for any of the following:

- Accidents or legal action involving alcohol or drug use (e.g., driving under the influence).
- Driving without a license.
- Hit-and-run driving or leaving the scene of an accident.
- Unauthorized use of AECOM vehicles (e.g., using an AECOM vehicle for moving personal items, carrying passengers who are not associated with work activities, etc.).

4.13.5 The employee's driving privileges may be suspended for any of the following:

- Two or more at-fault accidents involving the same Authorized Driver within a 12-month period.
- Multiple complaints from other employees or members of the public about driving performance.
- Any accident caused by an AECOM Authorized Driver where damages exceed \$2,500.
- Failure to comply with the distracted driving requirements.
- Gross misconduct or violation of policy.

4.13.6 An Authorized Driver's driving privileges may be reinstated as follows:

- For any suspension resulting from law enforcement agency legal action involving drugs and alcohol on the part of the former Authorized Driver, driving privileges may be reinstated only by concurrent agreement of the Vice President of SH&E for the applicable Business Group and Human Resources Manager.
- For those Authorized Driver's privilege suspensions that are not related to driving under the influence of drugs or alcohol, privileges may be reinstated with concurrent agreement by the AECOM Manager, the SH&E Manager, and Human Resources Manager upon completion of required remedial training.

4.13.7 Disciplinary action may include the following:

- Loss of AECOM driving privileges.
- Disciplinary warning.
- Termination.

4.13.8 The employee is personally responsible for payment of fines for moving violations and parking citations incurred while driving a vehicle on AECOM business and for reporting such incidents to his/her Manager / Supervisor. The Manager is responsible for notifying Counsel.

4.13.9 If an Authorized Driver receives a citation resulting in the license being suspended from driving or has his/her driver's license revoked, he/she is required to notify his/her Manager / Supervisor prior to start of the following work day. Failure to do so may result in disciplinary action up to and including termination.

5.0 Records

5.1 Documentation of employee training completed shall be retained in accordance with *S3AM-003-PR1 SH&E Training*.

5.2 As applicable, completed *S3AM-005-FM2 Vehicle Inspection Checklists* and/or *S3AM-005-FM1 Journey Management Plans* shall be retained in project files.

6.0 Attachments

6.1 [S3AM-005-ATT1 Authorized Driver Safety](#)

6.2 [S3AM-005-FM1 Journey Management Plan](#)

Driving (S3AM-005-PR1)
Revision 10 July 31, 2019

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11 of 12

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6.3 [S3AM-005-FM2 Vehicle Inspection Checklist](#)

Americas

Housekeeping

S3AM-013-PR1

1.0 Purpose and Scope

- 1.1 This procedure provides AECOM's basic housekeeping requirements for offices and work sites, as well as establishes personal hygiene and sanitation standards for housekeeping.
- 1.2 This procedure applies to all AECOM Americas-based employees and operations and any other entity and its personnel contractually required to comply with this document's content.

2.0 Terms and Definitions

- 2.1 None

3.0 References

- 3.1 S3AM-208-PR1 Personal Protective Equipment

4.0 Procedure

4.1 Roles and Responsibilities

4.1.1 Managers / Supervisors

- Implementation of this procedure at all AECOM sites and offices.
- Confirm inspections are performed at appropriate intervals.
- Confirm the building Property Manager maintains leased facilities effectively.

4.1.2 SH&E Managers

- Monitor, assess, and report on housekeeping when visiting AECOM sites.

4.1.3 Employees

- Report any areas of concern to their Manager / Supervisor for prompt resolution.
- Maintain office locations that are free from debris, clutter, and slipping or tripping hazards.

4.2 General Housekeeping

- 4.2.1 All aisles, emergency exits, fire extinguishers, etc., will be kept clear (a minimum of three feet / 0.9 meters of either side) of material storage (temporary and permanent) at all times.
- 4.2.2 Areas in front of electrical panels will be kept clear and free of debris and materials storage for a minimum distance of 36 inches, or approximately 0.9 meters.
- 4.2.3 All work areas shall be kept clean to the extent that the nature of the work allows.
- 4.2.4 Spills shall be promptly cleaned up and resulting waste will be disposed of properly.
- 4.2.5 Storage areas will be maintained in an orderly manner at all times. When supplies are received, the supplies will be stored properly.
- 4.2.6 At all times, work areas will be kept free of debris and unused materials, tools and equipment that may affect the safety of employees and visitors.
- 4.2.7 All sharps, and sharp objects, shall be stored and/or guarded in a manner that prevents injury.
- 4.2.8 Recyclable material, debris and trash will be collected and stored in appropriate containers (e.g., recycle bins, plastic trash bags, garbage cans, roll-off bins) prior to disposal or recycling.

- 4.2.9 Containers maintained outdoors shall be provided with lids that are kept closed. Contents shall be removed at appropriate intervals (e.g. garbage weekly, garbage daily in areas with wildlife, monthly recyclable cardboard, etc.).
- 4.2.10 Take positive control measures for protection against vermin, insects, and rodents.
- 4.3 Smoking, Eating, and Drinking
 - 4.3.1 Eating and drinking will be permitted in designated areas. These areas shall be located away from the work zone.
 - 4.3.2 Operate and maintain food dispensing facilities established by AECOM in compliance with applicable health and sanitation regulations.
 - 4.3.3 Buildings housing food dispensing facilities shall be floored completely, painted, well lighted, heated, ventilated, fly proof, and sanitary. Equip doors and windows with screens.
 - 4.3.4 Microwave ovens shall be used for food only.
 - 4.3.5 Use refrigerators designated for food storage for food only (i.e., no chemical or samples storage).
 - 4.3.6 Hand washing stations shall be available nearby for employees entering the eating and smoking areas.
 - 4.3.7 Smoking will be permitted only in areas:
 - Designated in compliance with applicable local laws, regulations, legislation and ordinances;
 - Not in the immediate vicinity of work-related activities or designated eating and drinking areas.
 - Free of fire hazard;
 - That will not contaminate indoor areas and HVAC systems. Specifically, there shall be no smoking within 5 metres (16 feet) around doorways, windows, air vents, and HVAC intakes and equipment; and
 - Supervisors will designate each smoking area giving primary consideration to those employees who do not smoke.
 - 4.3.8 Employees 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).
 - 4.3.9 Site employees will first wash hands and face after completing work activities which involve potential exposure or contact with hazardous substances and prior to eating or drinking.
- 4.4 Water Supply
 - 4.4.1 Water will be available for use on all AECOM sites and will comply with the following requirements:
 - Potable Water:
 - An adequate supply of drinking water will be available for site staff consumption.
 - Potable water can be provided in the form of approved well or city water, bottled water, or drinking fountains.
 - Water coolers and water dispensers shall be maintained in a sanitary condition and filled only with potable water.
 - Where drinking fountains are not available, individual use cups will be provided as well as adequate disposal containers. Do not use common drinking cups.
 - Potable water containers will be properly identified in order to distinguish them from non-potable water sources.
 - Laboratory-test drinking water obtained from streams, wells, or other temporary sources in accordance with applicable regulations, or often enough to ensure it is suitable for consumption. Maintain records of testing reports and results.

- 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 labelled as such.

4.5 Toilet Facilities

4.5.1 Clean and sanitary toilet facilities in good repair will be available for site and office staff and visitors. For locations without flush toilets readily available, one of the following shall be provided:

- Chemical toilets.
- Combustion toilets.
- Recirculation toilets.

4.5.2 A minimum of one toilet will be provided for every 20 site staff, with separate toilets maintained for each sex, except where there are less than five total staff on site or in an office.

4.5.3 Where toilet facilities will not be used by women, urinals may be provided instead of water closets in accordance with jurisdictional regulations.

4.5.4 Provisions for toilet facilities shall be considered as being met when mobile crews or employees working at normally unattended work locations have transportation immediately available (within 4 minutes travel time) to nearby toilet facilities.

4.5.5 Toilets shall be constructed so that the interior is lighted, by artificial or natural light, adequate ventilation is provided, and all windows and vents are screened.

4.5.6 A means for washing hands shall be provided next to or near toilet areas.

4.5.7 Release sanitary sewage into sanitary sewer lines or to other proper disposal channels.

4.6 Washing Facilities

4.6.1 Hand and Face: As applicable to the individual's potential exposure or contact with hazardous substances, site staff will wash hands and face after completing work activities and prior to breaks, lunch, or completion of workday.

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

4.7 Work Areas

4.7.1 Worksites which store chemical or environmental samples in refrigerators will clearly label the refrigerators that no food or beverages permitted and will locate refrigerators and sample coolers used for temporary sample storage, away from any food areas.

4.7.2 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 footwear shall be provided.

4.7.3 Protruding objects or placement of materials on paths or foot traffic areas creates the risk of slips, trips, falls, and puncture wounds. Employees shall eliminate slip, trip, and fall hazards where reasonably practicable.

4.7.4 At no time will debris or trash be intermingled with waste PPE or contaminated materials.

4.8 Break Areas and Lunchrooms

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

4.8.1 All food and drink items will be properly stored when not in use.

- 4.8.2 Food items will not be stored in personal lockers for extended periods in order to prevent the potential for vermin infestation.
 - 4.8.3 Perishable foods will be refrigerated whenever possible.
 - 4.8.4 All waste food containers will be discarded in trash receptacles.
 - 4.8.5 All tables, chairs, counters, sinks, and similar surfaces will be kept clean and free of dirt, waste food, and food containers at all times.
 - 4.8.6 All ice dispensing machines for beverages shall be hands free/touchless design to prevent bacterial contamination (no ice scoops or ice bins permitted, closed beverage containers can be stored in portable ice coolers but the ice may not be used in the beverage).
 - 4.8.7 Refrigerators used to store food items will be maintained at 40 degrees Fahrenheit (4 degrees Celsius) and emptied of all unclaimed food items weekly. Refrigerators used to store food will be labelled as such so that only food and drinks are stored within the refrigerator.
 - 4.8.8 Routine cleaning of refrigerators will also be performed on a regular basis.
- 4.9 Change Rooms and Sleeping Facilities
- 4.9.1 Heated and ventilated change rooms shall be provided for changing, hanging, and/or drying clothing for operations subjecting employees to prolonged wetting or contact with hazardous materials.
 - 4.9.2 Temporary sleeping quarters shall be heated, ventilated, lighted, and clean with all doors and windows screened.
 - 4.9.3 Keep clean and sanitary, and periodically disinfect bunkhouses, bedding, and furniture.
- 4.10 Office Areas
- Office areas are to be kept neat and orderly. The following general rules apply to prevent injuries and to maintain a professional workplace appearance.
- 4.10.1 All waste receptacles shall be lined with a plastic trash bag to avoid direct contact with waste during disposal. Employees shall use gloves when handling waste and may use a compaction bar to compress waste when necessary.
 - 4.10.2 Keep file and desk drawers closed when not in use to avoid injuries. Open only one file drawer at a time to prevent tipping of file cabinets. Nothing should be stored on top of high filing cabinets without adequate support.
 - 4.10.3 Telephone cords, electrical cords, wastebaskets, open file cabinets, and other ground-level hazards shall be managed in a manner that protects employees from tripping and obstruction hazards.
 - Electrical cords and computer/phone cables will be bundled and stored.
 - Cord covers should be used to protect temporary extension cords (used for presentations etc.) where they could be a tripping hazard.
 - Small electrical appliances shall not be plugged into portable extension cords.
 - Multiple appliances amperage should not exceed the circuit load limits.
 - 4.10.4 Electrical appliances shall not be used in wet areas unless the circuit is equipped with ground fault circuit interrupters (GFCI).
 - 4.10.5 File cabinets, desk drawers, safes, and other doors shall be fitted with handles or other hardware to protect employees from pinch points.
 - 4.10.6 All materials shall be stored in a manner that prevents tipping of storage furniture (e.g. book shelves, file cabinets) and inadvertent falling of overhead material.

- 4.10.7 Do not stack excessive amounts of papers or other material on shelves to reduce possibility of shelf overload or falling items.
- 4.10.8 Workstations should be tidied, as a minimum, at the end of each day.
 - Paperwork that is not currently needed should be filed appropriately
 - Refrain from storing items on the floor as they may become falling or tripping hazards.
- 4.10.9 In public areas of the office:
 - Maintain chairs in good repair.
 - Keep rugs clean, in good repair, and free of tripping hazards.
 - Clean up spills immediately.
 - Pick up objects that may have been left on the floor by others.
 - Report loose carpeting, damaged flooring, or other obstructions that are present in walkways.
- 4.10.10 Broken or damaged office furniture and equipment shall be removed from service. Office equipment shall be repaired and serviced by qualified personnel or contractors.

5.0 Records

- 5.1 None

6.0 Attachments

- 6.1 [S3AM-013-FM1](#) [Housekeeping Inspection](#)



Americas

Manual Lifting

S3AM-014-PR1

1.0 Purpose and Scope

- 1.1 This procedure provides the requirements for AECOM employees to use when performing manual materials handling activities (e.g., lifting/handling of items or materials).
- 1.2 This procedure applies to all staff for AECOM Americas-based operations and any other entity and its personnel contractually required to comply with this document's content.

2.0 Terms and Definitions

- 2.1 **Manual Materials Handling (MMH)** – Moving or handling things by lifting, lowering, pushing, pulling, carrying, holding, or restraining.
- 2.2 **Team Handling** – Team handling occurs when more than one person is involved during the lift.

3.0 References

- 3.1 None

4.0 Procedure

4.1 Roles and Responsibilities

4.1.1 Manager

- Administer the procedure, provide resources as required and provide direction on proper lifting/handling techniques.
- Ensure material handling activities are monitored and facilities assessed to ensure compliance with the procedure and proactively identify and correct hazardous conditions.
- Ensure the proper reporting and investigations of any incidents, including those associated with manual material handling.
- Ensure this procedure and any associated or applicable documents are reviewed as part of an investigation and revised as required to prevent future incidents.

4.1.2 SH&E Manager

- Ensure material handling activities are monitored and facilities assessed to ensure compliance with the procedure and proactively identify and correct hazardous conditions.
- Assist in identifying activities with a high potential for lifting/handling strains and injuries as well as the associated mitigation strategies.
- Ensure employee training on proper lifting/manual materials handling techniques.
- Assist in any investigations of incidents, including those associated with manual material handling.

4.1.3 Employees

- Complete training appropriate to their anticipated manual material handling tasks.
- Review and follow any additional procedures or instructions applicable to the task at hand.

4.2 Mechanical / Engineered Controls

- 4.2.1 Whenever possible, new operations should be evaluated to engineer out hazards before work processes are implemented.



- 4.2.2 Mechanical equipment or assistance such as hand carts, dollies, carts, come-alongs, conveyors, rollers, or if appropriate, pallet jacks, skid steers, or telehandlers, are preferable to be used whenever possible rather than the employee physically moving materials.
 - 4.2.3 Mechanical assistance will be of proper size and height, have wheels sized for the terrain, and be designed to prevent pinching or undue stress on joints.
 - 4.2.4 Mechanical equipment or assistance shall be inspected and appropriately maintained. Defective equipment shall be tagged, removed from service, and repaired or replaced.
 - 4.2.5 Objects to be moved will be secured to prevent falling and properly balanced to prevent tipping.
 - 4.2.6 Material handling tasks should be designed to minimize the weight, range of motion, and frequency of the activity.
 - 4.2.7 Alter the task to eliminate the hazardous motion and/or change the position of the object in relation to the employee's body—such as adjusting the height of a pallet or shelf.
 - 4.2.8 Work methods and stations should be designed to minimize the distance between the person and the object being handled.
 - 4.2.9 Confirm well-lit and clear paths of travel.
 - 4.2.10 High-strength push-pull requirements are undesirable, but pushing is better than pulling. Material handling equipment should be easy to move, with handles that can be easily grasped in an upright posture.
 - 4.2.11 Workbench or workstation configurations can force people to bend over. Corrections should emphasize adjustments necessary for the employee to remain in a relaxed upright stance or fully supported seated posture. Bending the upper body and spine to reach into a bin or container is highly undesirable. The bins should be elevated, tilted, or equipped with collapsible sides to improve access.
 - 4.2.12 Repetitive or sustained twisting, stretching, or leaning to one side are undesirable. Corrections could include repositioning bins and moving employees closer to parts and conveyors
- 4.3 Administrative Controls
- 4.3.1 Task hazard assessment (THA) must include manual material handling, its associated hazards and the appropriate actions to take to eliminate or reduce the identified risks.
 - 4.3.2 Stage materials close to the applicable work area to minimize carrying distances.
 - 4.3.3 When significant, sustained lifting work is required, it is desirable to rotate employees to spread the work load among several people and thereby avoid fatigue.
 - 4.3.4 Rotation is not simply performing a different job, but is performing a job that utilizes a completely different muscle group from the ones that have been overexerted.
 - 4.3.5 All employees exposed to manual handling hazards shall be trained by competent persons on the hazards associated with manual material handling, and the safe lifting and handling of loads applicable to their anticipated manual handling tasks.
 - 4.3.6 Employees shall not manually handle materials in excess of their personal lifting limit, with no personal lifting limit exceeding 50 pounds (22.7kg).
 - Manual handling weight limits may decrease from 50 pounds (22.7kg) depending upon several variables. Refer to *S3AM-014-ATT1 Recommended Weight Limit Calculations*.
 - This restriction should also be applied to a team handling or a buddy lift (item lifted by the team should be no more than 50 pounds [22.7kg]). Should one lifter fail, the remaining worker would bear 100% of the load weight.

4.4 Training

4.4.1 Employees who may have MMH as part of their duties are required to receive training that includes the following topics:

- Methods to avoid unnecessary physical stress and strain during MMH operations.
- Signs and symptoms of musculoskeletal injuries and reporting requirements.
- Methods to maintain personal awareness of what the individual can comfortably handle without undue strain.
- Instruction on the proper use of lifting equipment.
- Recognition of potential hazards and how to prevent or correct them.

4.4.2 This training must be completed prior to an employee being assigned to a task that involves MMH activities.

4.4.3 Assistance with training or training materials is available through the Safety, Health and Environment staff.

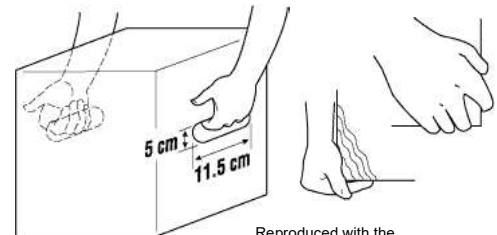
4.5 General Handling

4.5.1 Before Performing a Lift:

- Check to see if mechanical aids such as hoists, lift trucks/dollies, or wheelbarrows are available.
- Confirm that, based on personal physical capabilities and medical limitations, that the load can be lifted without overexertion. Get help with heavy or awkward loads.
- Confirm that the load is “free” to move.
- Do not lift loads if personal health issues or doctors recommendations prevent it.
- Manual handling weight limits may decrease depending upon several variables. Refer to *S3AM-014-ATT1 Recommended Weight Limit Calculations*.
- Do not manually handle loads if unsure of personal limitations on what load can be handled safely.
- Check that the planned destination and travel path of the load is free of obstacles, personnel and debris.
- Confirm that the travel path and the planned destination of the load are clear of obstacles and debris. Grease, oil, water, litter, and debris can cause slips and falls.
- Particular handling and lifting techniques are needed for different kinds of loads or materials being handled (for example, compact loads, small bags, large sacks, drums, barrels, cylinders, and sheet materials like metal or glass). See additional guidance in this procedure.

4.5.2 Gripping the Load

- Whenever possible, utilize hand holds or other lifting attachments on objects being handled.
- Use the “hook grip” on loads with cut-out handholds.
- Curl fingers around the edge.
- Do not hold the load with fingertips. The palm grip is much more secure; grip the load with the palm of the hand and fingers.
- Use containers with handles located more than halfway up the side of the container.
- Use the “ledge grip” to handle regularly shaped objects without handles.



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- Use vacuum lifters to handle sheet materials or plates.
- Hold the object with hands placed diagonally.

4.5.3 General Lifting Guidelines

- Prepare for the lift by warming up muscles. Frequently re-energize muscles throughout the course of the work.
- Avoid lifting immediately after prolonged sitting or inactivity.
- Confirm personal protective equipment is appropriate to the hazards (e.g. safety toed boots, appropriate gloves, etc.).
- Stand close to the load and face the intended direction of travel.
- Ensure good body balance. Feet should be shoulder width apart, with one foot beside and the other foot behind the object that is to be lifted.
- Bend the knees; do not stoop. Keep the back straight, but not vertical. There is a difference. The neck should be in a natural position with eyes forward.
- Engage (tighten/flex) abdominal muscles. Use legs to start the load moving and continue pushing up with the legs. This makes full use of the strongest set of muscles.
- Keep the arms and elbows close to the body while lifting smoothly without jerking.
- To lower the object, bend the knees. Do not stoop. To deposit the load on a bench or shelf, place it on the edge and push it into position. Confirm that your hands and feet are clear when placing the load.

4.5.4 Carrying/Holding Guidelines

- Manual carrying is an inefficient way of transporting materials in the work place. Where possible, reduce or eliminate manual carrying tasks.
- Never carry a load above the shoulders.
- Do not twist the body while carrying the load. To change direction, shift foot position and turn the entire body.
- Watch direction of travel!
- Carry an object close to the body using both hands. The optimal carry zone should have the elbows at a 90 degree angle with elbows tight to the body. One-handed carries are awkward and tend to unbalance the body.
- Do not carry objects that are so large they will obstruct visibility.
- Do not change grips on an object while carrying or holding an object. Rest the object on a secure surface prior to changing grip.
- If an object is of a size, shape, or mass that it requires two people to carry, use two people of similar size and physique.
 - Ensure the item lifted and carried by the team weighs no more than 50 pounds (22.7kg). Remember manual handling weight limits may decrease from 50 pounds (22.7kg) depending upon several variables. Refer to *S3AM--014-ATT1 Recommended Weight Limit Calculations*.
 - Two-person lifts should be planned and coordinated before performing the lift.
 - Lift the item in unison.
- Avoid carrying objects on stairs, particularly where the line of sight may be obstructed or the object can interfere with leg movement. All travel on stairs requires use of a handrail at all

times, so only carry objects that can be safely handled with one hand. Always maintain handrail contact when carrying an object up or down stairs.

4.6 Specific Handling - Pushing/Pulling Guidelines

- 4.6.1 Check the condition of the floor, ground, or other surface prior to pushing or pulling an object across it.
- 4.6.2 Be aware of the “break out” force of the object; this is the force at which a push or pull overcomes the frictional force between the surface and object. Adjust lower body posture to have a solid base in order to avoid losing balance when this point is reached.
- 4.6.3 Get assistance when moving or guiding a large load.
- 4.6.4 Where possible, always push rather than pull a load.
- 4.6.5 When possible push at waist height not shoulder height. The force capability at shoulder height is 50% less than at waist level.
- 4.6.6 Casters or wheels on carts should be at least 6 inches (15.24 centimeters) diameter for heavier loads in order to exercise adequate control on rough or inclined surfaces. Tire materials should be suitable for the surface of travel.
- 4.6.7 Never load the cart or load-carrying device in such a manner that visibility is obstructed in the path of travel.
- 4.6.8 When pushing or pulling an object on an inclined surface, ensure control of the load and direction of travel before proceeding. Obtain additional support to control the load if necessary.
- 4.6.9 Never leave carts or loads in an area that will present a hazard to other workers. Make sure carts or transport devices are secured in position before leaving them unattended.

4.7 Specific Handling – Square or Rectangular Objects

- 4.7.1 Place one foot slightly in front of the other.
- 4.7.2 Squat as close to the object as possible.
- 4.7.3 Grasp one of the top corners away from the body and the opposite bottom corner closest to the body.
- 4.7.4 Tilt the object slightly away from the body, tilt forward at the hips, keep the back straight.
- 4.7.5 Test to confirm that the object is loose from floor and will lift without snagging.
- 4.7.6 Straighten the legs, keeping the spine straight, pull the object into the body, and stand up slowly and evenly without jerking or twisting.
- 4.7.7 If turning or change of direction is required, turn with feet without twisting the torso and step in the direction of travel.
- 4.7.8 To set an object down, reverse the sequence, being sure not to trap the bottom hand between the object and the surface on which the object is set.



4.8 Specific Handling – Cylindrical Objects

- 4.8.1 When lifting/moving round or cylindrical objects, the objects should be rolled wherever possible.
 - Check the integrity of drums of gas cylinders before handling. Confirm lids or caps are secured prior to moving.
 - Rolling must be controlled by chute, tagline, or other means of limiting acceleration.

- Workers must not be positioned downhill from rolled objects.
- Use of the legs for pushing and tagline control of rolled objects must be stressed.

4.8.2 Cylindrical objects, such as drums that must remain upright, are to be handled manually by slightly tilting the object, using the legs for control, and balancing the object on the bottom edge. The handler then walks besides the object, with the object tilted toward the body, positioning the hands on the top edge away from the body and moving so they do not cross, thus maintaining balance and a steady, controlled, forward motion. Motion must be controlled so that ceasing to walk and moving the hands will stop forward motion.

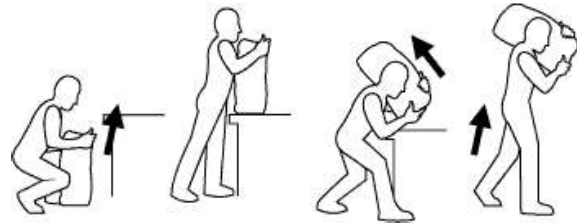
4.8.3 Use carts or trucks to transport cylinders. Never attach a lifting or moving device to the cap or lid.

4.8.4 Use two people to transport a cylinder if carts cannot be used. Use lifting straps to improve grip.

4.9 Specific Handling – Bags and Sacks

4.9.1 The best way to handle a bag depends on its size, weight, and how far it is to be carried. When lifting, remember to:

- Straddle the end of the bag.
- Bend the hips and knees.
- Keep the back straight.
- Grasp the bag with both hands under the closer end. Keep elbows inside the thighs.



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- Lean forward, straightening the knees to set the bag upright.
- Readjust the straddle position moving feet closer to the bag.
- Readjust the grasp, with one hand clasping the bag against the body and the other hand under the bag.
- Stand up by thrusting off with the back leg and continuing in an upward and forward direction.
- Thrust the bag up with the knee while straightening the body. If possible place the bag on an intermediate platform to enable the grip / grasp to be readjusted.
- Put the bag on the shoulder opposite the knee used to thrust the bag up.
- Stabilize the bag on the shoulder.
- Move off without bending sideways.

4.9.2 Avoid unloading a bag from the shoulder directly to floor level. Use an intermediate platform or get help from a co-worker, remember to:

- Stand close to the platform.
- Place one foot in front of the platform.
- Bend hips and knees.
- Keep the back straight.
- Ease the bag off the shoulder and put it upright on the platform.
- Pull the bag slightly over the edge of the platform.
- Stand close to the platform with the bag touching the chest.
- Clasp the bag against the body with one hand, the other hand holding bottom of the bag.
- Step back.
- Bend hips and knees, keeping back straight.

- Ease the bag onto the floor.

4.9.3 Bulkier sacks are easier to carry on a worker's back. The worker is to lift the sack to his/her back from a platform:

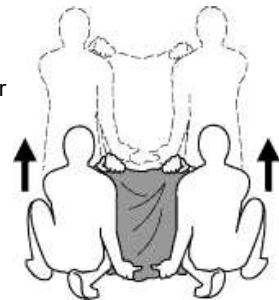
- Move the sack to the edge of the platform.
- Put back against the sack.
- Grasp with both hands on the upper corners of the sack.
- Ease the sack onto the back, bending hips and knees before taking the weight.
- Keeping the back straight, stand up, straighten hips and knees and stabilize the sack.
- Move away without bending sideways.



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4.9.4 Two-person handling of a sack:

- Position one person on either side of the sack.
- Squat with one foot balancing behind the sack.
- Keeping the back straight, grasp with the outer hand on the upper corner of the sack and the other hand holding the bottom of the sack.
- On one person's command:
 - Stand up and straighten the hips and knees.
 - Move toward the intended location.
 - Put the sack in its intended location.



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4.10 Specific Handling – Sheet Materials

4.10.1 When lifting sheet materials:

- Stand close to the pile of sheets in a walking stance.
- Grasp sheet firmly at the midpoint of its long side with the closer hand.
- Pull sheet up and toward the body.
- Change grip using the other hand and put fingers on top of the sheet.
- Pull sheet up to the vertical position and to the side until one half is off the pile.
- Grasp the lower edge of the sheet with the free hand and support the hand by placing it on your knee.
- Stand up without bending or twisting body.

4.10.2 Whenever moving sheet materials, be cognizant of wind conditions.

4.10.3 To carry sheets (drywall, glass, metal, etc.):

- Use drywall carts or sheet hand trucks to carry sheet materials.
- Get help from another person where carts are not available.
- Apply carrying handles for manual carrying.
- Always use gloves and carrying handle for glass and other materials with sharp edges.

4.10.4 Use team lifting and carrying where other solutions are inappropriate.

- Remember that the combined strength of the team is less than the sum of individual strength. The item lifted by the team should be no more than 50 pounds (22.7kg).

- Select team members of similar height and strength and assign a leader to the team.
- Determine a set of commands to be used such as "lift," "walk," "stop," and "down." Make sure that everyone knows what to do when they hear the command.
- Follow the commands given by the team leader.
- Practice team lifting and carrying together before attempting the task.

4.11 Material Storage

- 4.11.1 Store materials at a convenient height.
- 4.11.2 Leave the lowest shelf unused if necessary.
- 4.11.3 Use vertically mobile shelves or elevating platforms to avoid bending and overhead reaching.
- 4.11.4 Use bin racks for storing small items.
- 4.11.5 Store heavy and frequently used materials between knee and shoulder height; preferably waist height.
- 4.11.6 Do not store materials at floor level.
- 4.11.7 Use hand trucks with elevating devices in storage and loading areas.
- 4.11.8 Use trucks with a tilting device to avoid bending.

5.0 Records

- 5.1 None

6.0 Attachments

- 6.1 [S3AM-014-ATT1 Recommended Weight Limit \(RWL\) Calculations](#)

Americas

Bloodborne Pathogens

S3AM-111-PR1

1.0 Purpose and Scope

- 1.1 Define the AECOM procedures for eliminating and/or controlling occupational exposure to Bloodborne Pathogens on AECOM projects and activities.
- 1.2 A written Exposure Control Plan shall be developed and implemented during all AECOM operations where there is a reasonable potential for occupational exposure of AECOM employees and/or subcontractors to bloodborne pathogens as a regulated waste.
- 1.3 This procedure's requirements apply to all AECOM Americas employees and operations and any other entity and its personnel contractually required to comply with this document's content. Any jurisdictional requirements exceeding those identified in this procedure shall be met when conduction work in the given jurisdiction.

2.0 Terms and Definitions

- 2.1 **Blood** – Human whole blood; human blood components such as plasma or platelets; and human blood products such as clotting factors.
- 2.2 **Bloodborne Pathogens (BBP)** – Pathogenic microorganisms that are present in human blood and that can infect and cause disease in persons who are exposed to blood containing these pathogens including but not limited to hepatitis B virus (HBV), human immunodeficiency virus (HIV), hepatitis C, malaria, syphilis, babesiosis, brucellosis, leptospirosis, arboviral infections, relapsing fever, human T-lymphotropic virus Type I, and viral haemorrhagic fever (Ebola).
- 2.3 **Exposure Control Plan (S3AM-111-ATT1)** – A plan that addresses the requirements applicable to specific AECOM projects and activities designed to eliminate or minimize employee exposure. The Exposure Control Plan shall be incorporated into the location specific SH&E Plan and shall be accessible to all employees. The Exposure Control Plan shall include:
 - Exposure determination.
 - The schedule and method of implementation for:
 - Methods of compliance;
 - Hepatitis B Vaccination;
 - Post exposure Evaluation;
 - Communications of Hazards to employees; and
 - Record Keeping.
 - Documentation methods for exposure incidents, to include:
 - Routes of exposure; and
 - The circumstances for which and exposure incident occurred.

Note: In the State of California this plan shall also address exposures to airborne pathogens.

- 2.4 **SH&E Plan** – A document prepared for a specific project or program that details the hazards, precautions, emergency planning, medical, and training requirements for that project or program.
- 2.5 **Occupational Exposure (Exposed)** – Reasonably anticipated skin, eye mucous membrane, or parenteral contact with blood or other potentially infectious materials that may result from the performance of an employee's duties. Employees will be considered to be potentially exposed, even though they are using the universal precautions specified for the project or program.



- 2.6 **Other Potentially Infectious Materials (OPIM)** – Body fluids and tissues including: semen, vaginal secretions, cerebrospinal fluid, synovial fluid, pleural fluid, peritoneal fluid, pericardial fluid, amniotic fluid, saliva, and any other body fluid that is visibly contaminated with blood. When it is difficult or impossible to differentiate between body fluids, all body fluids should be treated as if they are potentially infectious.

Note: In the State of California airborne pathogens are also considered infectious materials.

- 2.7 **Regulated Waste** – (1) liquid or semi-liquid blood or other potentially infectious materials; (2) contaminated items that would release blood or other potentially infectious materials in a liquid or semi-liquid state if compressed; (3) items that are caked with dried blood or other potentially infectious materials and are capable of being released during handling; (4) objects contaminated with blood that can pierce the skin; and (5) pathological and microbiological wastes containing blood or other potentially infectious materials.
- 2.8 **Source Individual** – An individual, typically one who has been injured, whose blood or saliva has come in contact with another individual, typically one who has rendered first aid or Cardio Pulmonary Resuscitation (CPR) to the injured party.
- 2.9 **Universal Precautions** – All body fluids and materials potentially contaminated by body fluids will be considered to be infectious unless the fluids were from the person performing the clean up or decontamination activities. All employees coming in contact with another person's body fluids shall assume that the fluids are infectious and shall wear prescribed Personal Protective Equipment.

3.0 References

- 3.1 S3AM-003-PR1 SH&E Training
- 3.2 S3AM-004-PR1 Incident Reporting, Notifications & Investigation
- 3.3 S3AM-017-PR1 Injury & Illness Recordkeeping
- 3.4 S3AM-128-PR1 Medical Screening & Surveillance
- 3.5 S3AM-208-PR1 Personal Protective Equipment
- 3.6 S3AM-209-PR1 Risk Assessment & Management

4.0 Procedure

4.1 Roles and Responsibilities

4.1.1 Occupational Health Manager

- Will review and maintain all medical records generated as a result of post-exposure follow-up and maintain all medical records related to the follow-up.
- Will, where appropriate, consult with AECOM's local medical providers about follow-up recommendations.

4.1.2 SH&E Manager

- Will review project / program-specific Exposure Control Plans (normally part of the SH&E Plan) prior to the initial mobilization, at least annually for continuing projects or programs, and whenever necessary to reflect modified tasks or procedures that affect occupational exposure to bloodborne pathogens.
- Will consult with the Occupational Health Manager regarding all bloodborne pathogens exposure incidents.
- Will maintain training records and post-exposure follow-up information.
- Will confirm that site-specific training is conducted for all employees working at sites where regulated wastes were disposed or for employees who may be occupationally exposed while working at a facility that handles regulated wastes.

- Will confirm the Hepatitis B vaccine is made available to all employees with a potential occupational exposure (e.g. paramedic, medical laboratory employee, etc.).
- Will review all incident reports and arrange for post-exposure follow-up with AECOM's local medical provider.
- Will offer recommendations on how to prevent an incident from recurring.

4.1.3 **Manager**

- See that all recommendations made by the SH&E Manager are implemented.
- Support the SH&E Manager in their efforts to prevent occupational and non-occupational exposures to bloodborne pathogens.

4.1.4 **Employee**

- Use all PPE and universal precautions required to prevent exposure to infectious materials.
- Follow the exposure control methods outlined in their Exposure Control Plan.
- Report potential exposure incidents to their Supervisor or Manager immediately.

4.2 Potential Exposure Situations

4.2.1 There are a few activities within AECOM where potential occupational exposures to blood or other potentially infectious materials are of concern. These activities may include:

- Investigations of properties that received regulated wastes.
- Site visits or audits at Treatment Storage and Disposal facilities where medical waste is handled.
- Site visits or audits at medical or health care facilities.
- The provision of first-aid or cardiopulmonary resuscitation (CPR) to AECOM, subcontractor, or client personnel (if the action is part of the employee's occupations duties [e.g. paramedic] and not provided as a voluntary action).

4.2.2 Although AECOM does offer first-aid and CPR training to its employees on a regular basis, providing such aid is often on a voluntary basis and not directed by AECOM. As such, potential exposures may not be considered occupational exposures within the context of the OSHA Bloodborne Pathogens Standard. Site-specific Exposure Control Plans shall differentiate voluntary first-aid duties from occupational exposures as a component of the exposure determination. Refer to *S3AM-209-PR1 Risk Assessment & Management*.

4.3 Unforeseen Exposure Situations

4.3.1 Occasionally, potentially infectious material is encountered during a activity where none was expected; when this happens, the work shall be stopped, employee training conducted, and an exposure control plan prepared prior to resuming activities with potential exposures.

4.4 Employee Training

4.4.1 All personnel who will work on projects or programs which involve potential contact with regulated wastes will be required to attend a training class prior to the start of the project or program and annually for continuing projects or programs. Refer to *S3AM-003-PR1 SH&E Training*. The specific requirements and provisions of the written Exposure Control Plan shall be provided to each AECOM Employee and subcontractor assigned to work at the program / project.

4.4.2 Either of the following two sources of employee training will be used by AECOM to educate Employees on the hazards of exposure to bloodborne pathogens:

- The local chapter of the American Red Cross or other recognized training provider.
- AECOM's in-house training program.

4.4.3 Training sessions will review the following:

- Requirements of OSHA's Bloodborne Pathogens Standard or equivalent, applicable jurisdictional requirements.
- Review of AECOM's Bloodborne Pathogen Procedure (this document).
- Situations within AECOM that may involve exposure to bloodborne pathogens.
- Bloodborne diseases and symptoms of disease.
- Means of transmission.
- Work practice controls to reduce risk.
- Use of personal protective equipment to reduce risk.
- Incident reporting.
- AECOM's Post-Exposure Medical Follow-Up Procedures:

4.4.4 When contracting for CPR and first-aid training sessions, AECOM will request that each session include a section on the hazards associated with exposure to bloodborne pathogens and protective measures that shall be followed when administering first aid, CPR, or other emergency medical care. At the end of the session, Employees will be provided with a copy of this procedure. This procedure will be reviewed and a question-and-answer session will be conducted at the end of the presentation.

4.4.5 If the training provider cannot provide such training, AECOM will conduct a Blood Borne Pathogen training session prior to the start of the first aid or CPR class.

4.4.6 AECOM has and will have little control over employees who have not received AECOM provided first aid or CPR training, but who choose to perform Good Samaritan acts. Any Employee who does perform a Good Samaritan act that results in exposure to blood or other potentially infectious materials will, however, be provided with post-exposure medical follow-up as described in this procedure.

4.5 Personal Protective Equipment

4.5.1 All body fluids and materials potentially contaminated by body fluids will be considered to be infectious. All Employees coming in contact with another person's body fluids shall assume that the fluids are infectious and shall wear prescribed personal protective equipment (PPE), refer to *S3AM-208-PR1 Personal Protective Equipment*.

4.5.2 The use of PPE to prevent exposure is more appropriate for the types of occupational and non-occupational exposures Employees might encounter than is the use of engineering or work practice controls that are more effectively instituted in medical care or laboratory facilities where employees are actually handling blood and other potentially infectious materials.

4.5.3 PPE such as Tyvek coveralls, shoe covers, and gloves will be provided to all field team members involved in site activities where regulated wastes may be present. Site-specific PPE requirements will be identified in the written Exposure Control Plan. The same type of PPE will also be available, if it is deemed necessary, for Employees involved with activities at TSD facilities that handle regulated wastes.

4.5.4 PPE will be provided to affected Employees at no cost.

4.6 Universal Precautions Kits

4.6.1 In those work areas where there is the potential for exposure to infectious materials, a universal precaution kit shall be readily available. The kit shall permit the clean-up, neutralization, transportation, and disposal of up to 1 litre of blood or body fluids. The kit shall contain the following items at a minimum:

- Safety shield/mask combination
- Liquid proof apron
- Medical-grade vinyl/nitrile gloves
- Liquid solidifier/deodorizer
- Pickup scoop with scraper
- Red biohazard waste bag with tie
- Germicidal solution with dry wipe
- Antimicrobial hand wipe
- ID tag
- Instructions for use

4.7 Personal Hygiene

- 4.7.1 Special provisions will be made so that hand washing facilities are available on-site for sites that are known to be contaminated with regulated wastes. Alcohol wipes will be available in the event that hand washing facilities are not immediately available.
- 4.7.2 To reduce the potential for infection, if skin contact with blood or other potentially infectious materials occurs, the exposed area should be washed with non-abrasive soap and water as soon as possible. Hand washing will also help to prevent the transfer of contamination from the hands to other areas of the body or other surfaces that may be contacted later. Even when protective gloves are worn, hands should be washed with non-abrasive soap and running water as soon as possible after the gloves are removed.
- 4.7.3 The use of an alcohol wipes should not be relied upon as the primary means of personal hygiene. Hands should be thoroughly washed with soap and running water as soon as possible.
- 4.7.4 If mucous membranes, such as the eyes, come in direct contact with blood or other potentially infectious materials, the area should be washed or flushed with water as soon as possible and reported immediately.

4.8 Reporting Exposure Incidents

- 4.8.1 All incidents in which an employee has been exposed to blood or other potentially infectious materials shall be reported to the employee's Supervisor and to the SH&E Manager immediately. An IndustrySafe on-line report shall be completed in accordance with *S3AM-004-PR1 Incident Reporting, Notifications & Investigation*. After reviewing the report, the SH&E Manager will provide recommendations, when appropriate, for preventing recurrence of the incident.

4.9 Medical Follow-Up to Exposure Incidents

- 4.9.1 Once notified, the SH&E Manager will in turn discuss the incident with AECOM's Occupational Health Manager and/or medical provider and make arrangements for an evaluation, refer to *S3AM-128-PR1 Medical Screening & Surveillance*. Prompt medical attention is important in the event of an exposure incident. If the incident occurs in the field, the Employee will either be asked to visit the local hospital or, if he/she chooses, return immediately to the office to visit AECOM's local medical provider.
- 4.9.2 An attempt will be made to test the affected employee, and if applicable, the source individual's blood, for bloodborne pathogens. No testing will be performed without the written consent of the exposed Employee or the source individual. If initially, the exposed Employee or the source individual does not consent to HIV serological testing, but does consent to HBV serological testing, AECOM will make provisions with the local medical provider to preserve the blood sample for at least 90 days in the event that after counselling efforts, the Employee voluntarily consents to HIV testing.

- 4.9.3 AECOM will rely on the professional judgment of its Occupational Health Manager and/or local medical providers in the event of an exposure incident. Evaluations and follow-up procedures will be provided according to the recommendations of the United States Public Health Service (USPHS), World Health Organization, or other Public Health organization in Canada and other countries in the Americas current at the time these evaluations and procedures take place. Minimally, a post-exposure evaluation and follow-up will include the following elements:
- Documentation of the route(s) of exposure
 - Circumstances under which the exposure incident occurred
 - Identification and documentation of the source individual in the case of first aid or emergency medical treatments
 - Collection and testing of source individuals and exposed employee's blood for HBV and HIV serological status as soon as feasible and upon consent
 - Post-exposure vaccination when medically indicated, as recommended by the USPHS
 - Counselling, if necessary
 - Evaluation of reported illnesses
- 4.9.4 Any and all follow-up recommendations offered by the physician will be immediately instituted by the SH&E Manager with the guidance of the Occupational Health Manager and/or the local medical provider and at no cost to the affected Employee. Repeat testing, counselling, and follow-up, if recommended, will also be provided at no cost to the Employee. AECOM will rely on the Occupational Health Manager and/or the local medical provider to provide counselling to Employees concerning infection status, including results of and interpretation of medical tests and advising the Employee about the protection of personal contacts.
- 4.9.5 All medical providers shall submit to AECOM's Occupational Health Manager and the affected Employee a written opinion of the post-exposure evaluation within 15 days of the completion of the evaluation.
- 4.9.6 All medical records generated as a result of the post-exposure evaluation will be retained in the office of the Occupational Health Manager, and as applicable AECOM's medical services provider, under lock and key and will be maintained with the strictest confidentiality. Refer to *S3AM-017-PR1 Injury & Illness Recordkeeping*.
- 4.10 Hepatitis Vaccination
- 4.10.1 Prior to performing site visits or field investigations where regulated wastes are stored, processed, or known to have been disposed of, AECOM will consult with the Occupational Health Manager and/or the local medical providers to determine if a hepatitis A or B vaccination is appropriate given the site conditions and the proposed scope of work. Where possible the first Hepatitis B vaccinations will be given prior to working at sites with known, potential occupational exposures.
- 4.10.2 Although AECOM does offer first-aid and CPR training to its Employees on a regular basis, providing such aid is often voluntary and not as a specified job duty of an Employee. As such, potential exposures may not be considered occupational within the context of the government Bloodborne Pathogens Standard. Pre-exposure hepatitis vaccinations will not typically be offered for voluntary roles.
- 4.10.3 Post-exposure hepatitis vaccination will be offered to Employees involved in an exposure incident within 24 hours of possible exposure.
- 4.10.4 The vaccinations discussed above shall be provided to Employees at no cost if required by the exposure determination.



4.11 Housekeeping

- 4.11.1 Other than through the provision of first aid or CPR, there is no potential for occupational exposure to blood or other potentially infectious materials within any of the AECOM offices. Therefore, the housekeeping requirements and requirements for warning signs and labels contained in the OSHA Bloodborne Pathogens standard are not applicable to our office operations.
- 4.11.2 When working at a site where regulated wastes have been disposed of, the specific housekeeping and warning sign requirements will be prescribed by the client and/or in the site-specific HASP.
- 4.11.3 When working at a client's facility, AECOM will review the facilities plan for compliance with all the requirements of the Bloodborne Pathogens Standard and will observe all housekeeping requirements, wear required PPE, and acknowledge all warning signs and labels as specified in the client's plan. If the client does not have an effective plan, AECOM will prepare a plan as part of the written Exposure Control Plan.

4.12 Regulated Waste Generated by AECOM

- 4.12.1 Any regulated waste generated by AECOM as a result of first aid activities or clean-up of potentially infectious material will be collected in sealed, watertight containers and disposed of according to the Host Employer's BBP program or disposed of through a permitted regulated waste facility.
- 4.12.2 Disposal manifests shall be maintained in accordance with local or governmental regulations.

4.13 Material Decontamination

- 4.13.1 Any areas or equipment that are contaminated by potentially infectious material will be decontaminated using a 10% solution of household bleach. Utilize appropriate personal protective equipment to control exposure to the bleach (e.g. safety goggles, gloves, etc.). Refer to *S3AM-208-PR1 Personal Protective Equipment*.

4.14 Procedure and Plan Review

- 4.14.1 All Exposure Control Plans for projects or programs extending over one year shall be reviewed annually by the SH&E Manager and affected Employees.

5.0 Records

- 5.1 Each SH&E Manager will maintain records and provide copies of the records to the Occupational Health Manager, related to bloodborne pathogens in accordance with the provisions of the standard and *S3AM-017-PR1 Injury & Illness Recordkeeping*.
- 5.2 Records maintained in accordance will include bloodborne pathogens exposure incidents, post-exposure follow-up, vaccination status, and training for all Employees with potential occupational exposure.
- 5.3 Employee medical and training records required by this procedure shall be provided upon request for examination and copying to the Employee, to anyone having written consent of the subject employee, or to State, Province, or Federal Occupational Safety and Health regulatory agencies.

6.0 Attachments

- 6.1 [S3AM-111-ATT1 Bloodborne Pathogens Exposure Control Plan](#)
- 6.2 [S3AM-111-FM1 Hepatitis B Vaccination Declination](#)

Americas

Compressed Gases

S3AM-114-PR1

1.0 Purpose and Scope

- 1.1 This procedure provides the requirements for using, handling, storing, transporting, disposition and/or decommissioning compressed gas cylinders.
- 1.2 This procedure applies to all AECOM Americas based employees and operations and any other entity and its personnel contractually required to comply with this document's content.

2.0 Terms and Definitions

- 2.1 **Compressed Air (Non-Breathable)** – Air that is at a pressure greater than that of the atmosphere. Compressed air shall not be used for cleaning purposes except where reduced to less than 30 psi and then only with effective chip guarding and personal protective equipment. Utilized for tools, equipment, and mechanical machinery and cleaning purposes as described in this procedure.
- 2.2 **Compressed Gas** – Any material or mixture in a pressure vessel having:
 - An absolute pressure exceeding 40 pounds per square inch (PSI) at 70°F (25 pounds per square inch gauge); or
 - An absolute pressure exceeding 104 Psia at 130°F, regardless of the pressure at 70°F.
- 2.3 **Cylinder** – Pressure vessel designed for pressures higher than 40 Psia and having a circular cross section.
- 2.4 **Decommission** – The removal of a compressed gas cylinder from service by rendering it permanently unusable.
- 2.5 **Disposition** – Recycling, treatment, or disposal of a compressed gas cylinder and/or its contents.
- 2.6 **Pneumatics** – The use of pressurized air to affect mechanical motion for machinery, equipment and tools.
- 2.7 **Psi** – Pounds per square inch.
- 2.8 **Psia** – Pounds per square inch absolute (i.e., pressure in a container that would appear on an ordinary gauge plus the local atmospheric pressure [14.696 psi at sea level]), psig- pounds per square inch gauge.
- 2.9 **Psig** – Pounds per square inch gauge. The pressure in a vessel or container as registered on a gauge attached to the container. This reading does not include the pressure of the atmosphere outside the container.
- 2.10 **Pressure Relief Valve** – A device installed on most cylinders to prevent the rupture of a normally pressurized cylinder when it is inadvertently exposed to fire or high temperatures.

3.0 References

- 3.1 S3AM-003-PR1 SH&E Training
- 3.2 S3AM-116-PR1 Hazardous Materials Shipping
- 3.3 S3AM-127-PR1 Exposure Monitoring
- 3.4 S3AM-208-PR1 Personal Protective Equipment
- 3.5 S3AM-209-PR1 Risk Assessment & Management
- 3.6 S3AM-332-PR1 Hot Work

4.0 Procedure

4.1 Roles and Responsibilities

4.1.1 Manager

- Ensuring the safety of employees on their project sites.
- Implement these procedures during all activities involving compressed gases.
- Seek consultation with the SH&E Manager when unknown compressed gas cylinders are encountered.
- Confirm employees have received the appropriate training as it relates to compressed gases/compressed gas cylinders.
- Confirm a hazard assessment/evaluation of the activities involving compressed gases has been completed.
- Contact the SH&E Manager prior to any compressed gas cylinder operation.
- Immediately report any leaking/suspected leaking compressed gas cylinder(s) to the SH&E Manager and implement the appropriate emergency action(s).
- Immediately report the discovery of any unknown compressed gas cylinder(s) to the SH&E Manager and cordon off the area in all directions a minimum of 50 feet (15.24 meters).
- Confirm that all compressed gas cylinders are properly inspected, stored, and, secured.
- Confirm that all compressed gas cylinders are handled in a safe manner, protecting both the person and cylinder.
- Confirm that all compressed gas cylinder manifolds and connections are properly made and inspected.
- Confirm an appropriate emergency response plan is established prior to the start of any compressed gas cylinder operation.

4.1.2 SH&E Manager

- Review and authorize all compressed gas cylinder operations.
- Conduct/support compressed gas hazard assessments/evaluations.
- Provide awareness training to project teams regarding hazards of encountered compressed gases.
- Support the identification/disposition of unknown compressed gas cylinders.
- Support the development of a site-specific cylinder plan.

4.1.3 Employee

- Immediately report any leaking/suspected leaking compressed gas cylinder(s) to a Manager.
- Immediately report the discovery of any unknown compressed gas cylinders to Project Manager.
- Properly handle all compressed gas cylinders.
- Shall be supervised by employees experienced in the operation of compressed gas tools and equipment.

4.2 Training

- 4.2.1 On-site orientation to the hazards of the equipment and the proper use, handling, and storage shall be completed for all employees handling or coming into contact with compressed air tools and equipment or compressed gas cylinders. Refer to *S3AM-003-PR1 SH&E Training* and *S3AM-114-ATT1 Compressor Safety*.

- 4.2.2 Employees shall be instructed on the PPE requirements for the applicable tasks. Refer to *S3AM-208-PR1 Personal Protective Equipment*.
- 4.3 General Use of Compressed Air or Gas
 - 4.3.1 Compressed air or other compressed gases are not to be used to blow dirt, chips, or dust from clothing while it is being worn. Compressed air used for other types of cleaning (other than clothing/persons) is to be limited to 30 psig.
 - 4.3.2 The use of blown compressed air is to be controlled, and proper personal protective equipment or safeguards utilized, to protect against the possibility of eye injury to the operator or other persons.
 - 4.3.3 Compressed air or gases are not to be used to empty containers of liquids.
 - 4.3.4 Compressed gases are not to be used to elevate or otherwise transfer any hazardous substance from one container to another unless the containers are designed to withstand the operating gas pressure with a safety factor of at least four.
 - 4.3.5 Compressed cylinders of unknown content will not be opened, but will be returned to the supplier, manufacturer or equivalent.
- 4.4 Air Compressor Operations
 - 4.4.1 Air compressor equipment should be operated only by authorized and trained employees.
 - 4.4.2 The air intake should be from a clean, outside, fresh air source. Screens or filters can be used to clean the air.
 - 4.4.3 Air compressors should never be operated at speeds faster than the manufacturer's recommendation.
 - 4.4.4 Equipment should not become overheated.
 - 4.4.5 Moving parts, such as compressor flywheels, pulleys, and belts that could be hazardous should be effectively guarded.
 - 4.4.6 Keep the air supplied tools clean and dry. Dust, moisture, and corrosive fumes can damage tools.
 - 4.4.7 Keep tools clean, lubricated, and maintained according to manufacturer's instructions.
 - 4.4.8 Only use attachments and accessories recommended by the manufacturer.
 - 4.4.9 Review the manufacturer's instruction before using a tool.
 - 4.4.10 Post warning signs where pneumatic tools are used.
 - 4.4.11 Set up screens or shields in areas where nearby workers may be exposed to flying fragments, chips, dust, and excessive noise.
 - 4.4.12 Be aware of proper handling and ergonomics while using the tool.
 - 4.4.13 Reduce physical fatigue by supporting heavy tools with a counter-balance wherever possible.
 - 4.4.14 Refer to *S3AM-114-ATT1 Compressor Safety* for additional information.
- 4.5 Air Hoses
 - 4.5.1 Use the proper hose and fittings of the correct diameter.
 - 4.5.2 Use hoses specifically designed to resist abrasion, cutting, crushing and failure from continuous flexing.
 - 4.5.3 Choose air-supply hoses that have a minimum working pressure rating of 1035 kPa (150 psig) or 150% of the maximum pressure produced in the system, whichever is higher.
 - 4.5.4 Check hoses regularly for cuts, bulges and abrasions. Tag and replace, if defective.
 - 4.5.5 Blow out the air line before connecting a tool. Hold hose firmly and blow away from yourself and others.

- 4.5.6 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).
- 4.5.7 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.
- 4.5.8 Do not operate the tool at a pressure above the manufacturer's rating.
- 4.5.9 Turn off the air pressure to hose when not in use or when changing power tools.
- 4.5.10 Do not carry a pneumatic tool by its hose.
- 4.5.11 Do not use compressed air to blow debris or to clean dirt from clothes.
- 4.5.12 All pipes, hoses, and fittings shall have a rating of the maximum pressure of the compressor. Compressed air pipelines should be identified (psi) as to maximum working pressure.
- 4.5.13 Air supply shutoff valves should be located (as near as possible) at the point-of-operation.
- 4.5.14 Air hoses should be kept free of grease and oil to reduce the possibility of deterioration.
- 4.5.15 Avoid trip hazards. Hoses should not be strung across floors or aisles where they are liable to cause employees to trip and fall. When possible, air supply hoses should be suspended overhead, or otherwise located to afford efficient access and protection against damage.
- 4.5.16 Hose ends shall be secured to prevent whipping if an accidental cut or break occurs.
- 4.5.17 Pneumatic impact tools, such as riveting guns, should never be pointed at a person.
- 4.5.18 Before a pneumatic tool is disconnected (unless it has quick disconnect plugs), the air supply shall be turned off at the control valve and the tool bled.
- 4.5.19 Shop air used for cleaning should be regulated to 15 psi unless equipped with diffuser nozzles to provide lesser pressure.
- 4.5.20 Goggles, face shields or other eye protection shall be worn by employees using compressed air for cleaning equipment.
- 4.5.21 Static electricity can be generated through the use of pneumatic tools. This type of equipment shall be grounded or bonded if it is used where fuel, flammable vapors or explosive atmospheres are present.
- 4.5.22 The following are hazards associated with the use of compressed air tools and equipment:
 - Poorly designed tool (wrist strain);
 - Vibration (vibration-induced white finger);
 - Noise (hearing loss); and
 - Dust (respiratory problems).
- 4.5.23 The following hazards have the potential to cause serious bodily injury when working with compressed air:
 - Incorrect tool selection;
 - Use of damaged tool;
 - Improper, inadequate, or no guards;
 - Rotating shaft (entanglement);
 - Wheel breakage (grinder);
 - Flying chips;
 - Whipping of the hose;
 - Accidental start up;

- Air embolism (compressed air injected into the body);
- Dropped tool; and
- Tripping over hose.

4.6 Compressed Air Equipment Maintenance

- 4.6.1 Only authorized and trained employees should service and maintain air compressor equipment.
- 4.6.2 Exposed, non-current-carrying, metal parts of compressor should be effectively grounded.
- 4.6.3 Low Flash Point lubricants should not be used on compressors because of its high operating temperatures that could cause a fire or explosion.
- 4.6.4 Equipment should not be over lubricated.
- 4.6.5 Gasoline or diesel fuel powered compressors shall not be used indoors.
- 4.6.6 Equipment placed outside but near buildings should have the exhausts directed away from doors, windows and fresh air intakes.
- 4.6.7 Soapy water or lye solutions can be used to clean compressor parts of carbon deposits, but kerosene or other flammable substances should not be used. Frequent cleaning is necessary to keep compressors in good working condition.
- 4.6.8 The air systems should be completely purged after each cleaning.
- 4.6.9 During maintenance work, the switches of electrically operated compressors should be locked open and tagged to prevent accidental starting.
- 4.6.10 Portable electric compressors should be disconnected from the power supply before performing maintenance.

4.7 Compressed Gas Cylinder Requirements

- 4.7.1 Cylinders are not to be used unless they bear Department of Transportation (DOT) or Transportation of Dangerous Goods (TDG) markings showing that they have been tested as required by DOT or TDG regulations.
- 4.7.2 Cylinders shall never be dropped, struck, or permitted to strike each other violently. Cylinders may be moved by tilting and rolling them on their bottom edges.
- 4.7.3 Valve protection caps shall always be kept on cylinders when they are being moved or stored, and until ready for use. Caution should be exercised as insects such as spiders, wasps, and bees may be encountered in cylinder caps.
- 4.7.4 Do not lift cylinders by the valve protection cap.
- 4.7.5 Cylinder valves are to be kept closed except when gas is being used or when connected to a permanent manifold. Valves of empty cylinders shall be closed.
- 4.7.6 Cylinders shall never be used as rollers or supports, or for any purpose other than carrying gas.
- 4.7.7 Valves and regulators shall be inspected for foreign materials such as oil or dirt and deficiencies such as damaged threads or broken gauges. Deficient valves or regulators shall be removed from service and replaced.
- 4.7.8 Threads on regulator connections or other auxiliary equipment shall be the same as those on the cylinder valve outlet.
- 4.7.9 Regulators shall be specific to the gas being used and no adapters may be used to connect regulators to cylinders.
- 4.7.10 When withdrawing cylinder content, open the cylinder valve slowly using the appropriate tool (e.g., manufacturer supplied, non-sparking, etc.). Point the valve opening away from yourself and other persons.

- 4.7.11 Before a regulator is removed from a cylinder, close the cylinder valve and release all pressure from the regulator. This procedure also serves as a check to confirm that the main cylinder valve is completely closed.
- 4.7.12 Never hammer the valve wheel in attempting to open or close the valve.
- 4.7.13 No person, except the owner of the cylinder or person authorized by the owner, shall refill a cylinder (Exceptions to this includes the filling of self-contained breathing apparatus cylinders with Grade D breathing air, or the filling of the [Foxboro] Organic Vapor Analyzer (OVA) hydrogen cylinders). Disposable cylinders shall not be refilled with any material after use of the original contents.
- 4.7.14 Cylinders of compressed gas shall be stored in areas where they are protected from external heat sources such as flame impingement, intense radiant heat, electric arc, or high-temperature steam lines.
- 4.7.15 Cylinders are to be stored in an assigned, well-ventilated area, with full and empty cylinders stored separately. Empty cylinders shall be marked 'empty'.
- 4.7.16 Stored fuel gases and oxygen cylinders are to be separated by at least 20 feet, or by a fire wall at least 5 feet high that has a fire-resistance rating of at least ½ hour.
- 4.7.17 Compressed gas cylinders shall only be stored or transported in an upright or vertical position. Horizontal storage or transportation of cylinders shall be conducted only as permitted by the applicable jurisdiction and in accordance with regulatory requirements (e.g., secured by chocks or ties to prevent rolling, foot plate, etc.).
- 4.7.18 Cylinders are to be secured to a fixed object by chain or equivalent fastening device whenever they are placed in an upright position. The protective cap is not to be removed or the cylinder valve opened until the cylinder is secured.
- 4.7.19 Repair of leaks shall never be attempted on a pressurized system. System pressure should be reduced to atmospheric pressure as rapidly as possible, and the Manager notified immediately.
- 4.7.20 Compressed gas cylinders shall be legibly marked for the purpose of identifying the gas content with either the chemical or the trade name of the gas. Such marking is to be done by means of stenciling, stamping or labelling, and shall not be readily removable. Whenever practical, the marking is to be located on the shoulder of the cylinder. Positive identification of the gas in any cylinder is required before connecting cylinders for use.
- 4.7.21 Gas cylinders moved by hoist shall be handled in suitable cradles or job-made "skip" (materials) boxes. Any slings used for this purpose shall be specifically designed for that cylinder handling.
- 4.7.22 Cylinders shall not be placed where they might form part of an electrical circuit.
- 4.7.23 Transfer of compressed gases (including acetylene) from one cylinder to another, or mixing of gases in a cylinder, is prohibited.
- 4.7.24 Oxygen cylinders are never to be stored near:
 - Highly combustible materials, especially oil and grease;
 - Reserve stocks of acetylene or other fuel gas cylinders; and
 - Any other substance likely to cause or accelerate fire.
- 4.7.25 Compressed oxygen is never to be used:
 - As breathing air;
 - To purge pipelines, tanks, or any confined area;
 - To supply a head-pressure tank;
 - In pneumatic tools;

- In oil preheating burners;
 - To start internal combustion engines;
 - For ventilation;
 - For cleaning clothing; and
 - In any other way as a substitute for compressed air.
- 4.7.26 Use of a cylinder's contents for purposes other than those intended by the supplier is prohibited.
- 4.7.27 Cylinders of compressed natural gas or propane equipped with a pressure relief device shall always be positioned in a manner that this device remains above the liquid level (e.g., if stored or installed horizontally on a forklift, relief device is positioned at the top).
- 4.7.28 Storage of liquefied petroleum gas (LPG) within buildings is prohibited, and outdoor storage or LPG shall meet applicable building and fire codes.
- 4.8 Special Precautions for Compressed Gas Cylinders Containing Hydrogen
- 4.8.1 Inside buildings, cylinders of hydrogen should be separated from oxygen cylinders by a minimum distance of 20 feet (6.1 meters) or by a barrier of non-combustible material at least 5 feet (1.5 meters) high having a fire resistance rating of at least one half hour.
- 4.8.2 Conspicuous signs should be posted in hydrogen storage areas forbidding smoking, open flames or the use of lights or lighting not approved for use in flammable areas.
- 4.8.3 Hydrogen storage areas shall be labeled, "Hydrogen-Flammable Gas-No Smoking-No Open Flame" or equivalent.
- 4.9 Inspection of Compressed Gas Cylinders
- 4.9.1 Prior to formally accepting any delivered compressed gas cylinders, a visual inspection of each cylinder will be documented as specified below. In addition, all compressed gas cylinders stored at an AECOM facility will be inspected monthly.
- Visually inspect cylinders, refer to *S3AM-114-FM1 Compressed Gas Cylinder Inspection*.
 - Verify that all the required markings are on the cylinders.
 - If required, determine when the cylinder was last hydrostatically-tested.
 - Inspect the safety relief devices, if required.
 - If any defects are noted during the inspection, the cylinder should be refused on delivery and a new delivery requested (notify the Manager).
- 4.9.2 Where compressed gas cylinders are stored at an AECOM facility, a qualified person will be designated to confirm cylinder activities comply with the requirements in this procedure. Inspection entails the evaluation of the integrity of the cylinder as well as the serviceability of any attached manifold and valve fittings. Inspection activities of cylinders beyond visual inspection are recommended to be conducted in isolation or a remote location for worker and public safety. The inspection of any cylinder will be conducted by a qualified person, refer to *S3AM-114-FM1 Compressed Gas Cylinder Inspection*.
- 4.10 Cylinder Inspection Procedures
- 4.10.1 All cylinder inspection procedures will adhere to the applicable regulatory requirement. At a minimum, the inspection process will include the following procedures:
- Observe the cylinder from a safe distance to identify any visual markings or other information.
 - Inspect the cylinder size, shape, and general condition (if visible, include the valve system/stem in the inspection process).

- If the cylinder or valve system appears to be in poor condition or has lost structural integrity, do not approach the cylinder. Observations indicating a cylinder is in poor condition may include:
 - Leaking,
 - Hissing sound,
 - Odor in vicinity of the cylinder,
 - Rusty components,
 - Bulging side wall or end, and/or
 - Corroded valve system.
- 4.10.2 If the cylinder is determined to be in poor condition, cordon the area off and limit access to necessary employees only.
- 4.10.3 Wear applicable PPE and approach the cylinder with the appropriate direct reading air monitoring instrument (do not approach from the ends of the cylinder), then determine the airborne contaminant concentrations in the immediate area.
- 4.10.4 Document cylinder information (e.g., visible markings, labels, placards, etc.).
- 4.10.5 Cylinders presenting potential deficiencies (e.g., dent, missing labels, valve protection cap cannot be removed by hand, corrosion, etc.) shall be tagged 'Do Not Use', removed from use, and returned to the supplier.
- 4.11 Ground Transport of Compressed Gas Cylinders
 - 4.11.1 AECOM will transport (drive/haul) quantities of compressed gases which do not exceed Materials of Trade (MOT) quantities, whereas the transport of placardable quantities is prohibited without the proper DOT / TDG licenses/credentials and consultation with the SH&E Manager.
 - 4.11.2 Compressed gas cylinders in portable service are to be conveyed by suitable trucks, to which they are securely fastened. All gas cylinders in service shall be securely held in substantial racks or secured to other rigid structures so that they will not fall or be knocked over.
- 4.12 Air/Common Carrier Transport
 - 4.12.1 All shipping of compressed gases via air/common carrier including instrument gases, regardless of quantity, shall be conducted by a qualified and trained HazMat Shipper (Level 1-2 Shipper) or jurisdictional equivalent, and shall be conducted under the oversight of a designated DOT/International Air Transport Association (IATA) shipping specialist, or jurisdictional equivalent. Refer to *S3AM-116-PR1 Hazardous Materials Shipping*.
 - 4.12.2 No compressed gas cylinder, regardless of contents or quantity, will be shipped via an external carrier vendor (i.e., UPS, FedEx, etc.) without the authorization of:
 - SH&E Manager, and
 - DOT/IATA shipping specialist.
- 4.13 Cylinder Color Coding Determination
 - 4.13.1 The color coding of compressed gas cylinders is established by the Compressed Gas Association, which has assigned specific colors to categories or classes of chemicals/substances. It is important to note there is currently not requirement to adhere to this color coding scheme.
 - 4.13.2 While recently manufactured cylinders reflect the color coding guidance established by the CGA, older cylinders may not reflect this nomenclature. It is also possible for cylinders to have been repainted a different color from their original.
 - 4.13.3 Cylinder contents should never be determined by the color of the cylinder alone. Colors are not uniform throughout the compressed gas industry.

- 4.13.4 Cylinder contents shall be identified by a decal, label, tag, or stenciling. If an identifying label is lacking or not legible, return the container to the supplier, unused.
- 4.14 Air Monitoring Requirements
- 4.14.1 Air monitoring requirements are dependent upon the specific substances contained within the cylinders and will be specified within the site-specific safety plan prepared prior to commencement of field activities. Air monitoring parameters, refer to *S3AM-127-PR1 Exposure Monitoring*, may include, but are not limited to:
- Explosivity (i.e., lower explosive limit [LEL]), and
 - Chemical-specific substance (e.g., chlorine, ammonia, arsine, etc.).
- 4.14.2 Action levels will be identified in the site-specific safety plan.
- 4.15 Cylinder Staging
- 4.15.1 Staging involves the organization, and sometimes consolidation, of cylinders that have similar contents or characteristics.
- 4.15.2 The staging of cylinders will occur in a remote location at the site in order to minimize the potential injury or property damage from an accidental release or emergency decompression (if the integrity of the cylinder is in question, it should not be moved).
- 4.15.3 Safe distances will be based on the evacuation distances provided in DOT's Emergency Response Guidebook (most current edition).
- 4.15.4 When multiple cylinders containing different substances are present, the distance should be based on the greatest evacuation distance required by the substances present.
- 4.16 Cylinder Disposition & Decommissioning Activities
- 4.16.1 Disposition refers to the recycling, treatment, or disposal of a compressed gas cylinder and/or its contents.
- 4.16.2 Recovery and recycling of materials are preferred over any other method of disposition. Cylinder disposition activities shall be approved by the SH&E Manager.
- 4.16.3 An effort should be made to recover and recycle the contents of a cylinder; however, if recovering or recycling the contents is not possible, then other options include:
- Venting to the Atmosphere,
 - Flaring,
 - Neutralization, and
 - Detonation.
- 4.16.4 Under no circumstances will poisonous, toxic, or ozone-depleting substances be vented to the atmosphere. Only cylinders containing flammable gases should be detonated, as the flammable contents will be consumed in the subsequent explosion.
- 4.16.5 If the cylinder valve has been determined to be inoperable, then the available options for disposition are limited to having an outside vendor perform the remote opening and sampling of the cylinder, or detonation of the cylinder where the cylinder contents are consumed in the subsequent explosion (flammable gases only).
- 4.16.6 All cylinders shall be inventoried, staged, and inspected.
- 4.16.7 Prior to the commencement of cylinder disposition and decommissioning activities, local emergency response agencies (i.e., Fire Department, Medical, and Emergency Response, if separate) shall be confirmed and, as applicable, activities coordinated with the local agencies.
- 4.16.8 Air monitoring is mandatory during cylinder disposition and decommissioning operations.

4.16.9 An SH&E Manager shall be contacted during the planning stages of a cylinder disposition and decommissioning effort in order to determine whether a site-specific cylinder plan is required.

4.17 Venting to the Atmosphere

4.17.1 Cylinders that contain non-flammable, non-toxic materials can be vented to the atmosphere. All venting activities will be performed in accordance with the following procedures:

- Atmospheric venting will be accomplished at a remote location and in compliance with all applicable environmental air regulatory requirements.
- Atmospheric venting activities will be completed in a Level B Ensemble (unless otherwise specified in the site-specific safety plan and cylinder plan).
- Venting activities will be dependent upon a wind direction that does not carry the outgas plume in the direction of an adjacent public structure.
- The cylinder will be properly grounded to confirm a static charge is not generated, potentially resulting in ignition of a flammable gas.
- All tools used on the cylinder will be non-sparking.
- Low-pressure discharging will not exceed 15 pounds per square inch gauge (psig).
- Once discharging has started, all workers will retreat to the exclusion zone (minimum 100 feet) around the remote location until the discharging process is complete.

4.18 Flaring

4.18.1 Flaring activities involve the combustion of the cylinder contents through the discharge of a low-intensity flame. Flaring activities will be performed in accordance with the following procedures:

- Flaring will be accomplished at a remote location and in compliance with all applicable environmental air regulatory requirements.
- All personnel involved with flaring activities shall be appropriately trained and wear PPE appropriate to the hazards (e.g. Nomex fire-retardant forearm-length gloves, other fire-retardant clothing, self-contained breathing apparatus, etc.).
- Flaring activities will be dependent upon a wind direction that does not carry the combustion plume in the direction of any offsite structure or activity, or into uncontrolled (public access) areas.
- The cylinder will be properly grounded to confirm a static charge is not generated, potentially resulting in ignition of a flammable gas.
- All tools used on the cylinder will be non-sparking.
- Low-pressure discharging will not exceed 15 pounds per square inch gauge (psig).
- A hot work permit shall be completed prior to the start of flaring activities, refer to S3AM-332-PR1 Hot Work.
- No other cylinders will be within 50 feet (15.24 meters) of the cylinder being flared.
- Flaring activities will use a low-pressure discharge and maintain a small, low-intensity flame.
- A firewatch will be established, with a worker stationed outside the exclusion zone with a fire extinguisher (20A:100B:C) during flaring activities (i.e., fire watch). During the work the worker assigned to the firewatch will have no other duties.
- The flare will be positioned so that it is not pointing toward any flammable materials, persons, or equipment in the immediate area.

4.19 Neutralization

4.19.1 Neutralization refers to the on-site neutralization of the cylinder contents through a controlled chemical reaction process. Specialized equipment may be necessary based on the chemical involved, as well as reaction by-products, catalysts, or physical conditions (i.e., temperature, acidic, basic, etc.). Neutralization activities will be performed in accordance with the following procedures:

- Neutralization is the required disposition method for cylinders containing acid gases, as well as many alkaline gases.
- The neutralization process shall be approved by a professional engineer (e.g., chemical) or based on a published chemical-specific neutralization methodology.
- Liquid levels in the reaction vessels will be maintained at least 12 inches (30.5 centimeters) below the top of the vessel.
- Based on the specific chemical reaction, the temperature of the reaction vessel and its contents will be monitored continuously and controlled accordingly.
- Pressure levels will be maintained within acceptable limits to prevent the reaction from accelerating, unwanted by-product formation, or the break-through of the chemical intended to be neutralized.
- Employees involved in neutralization activities shall be appropriately trained and wear the PPE identified within the site-specific safety plan and cylinder plan.

4.20 Detonation

4.20.1 Detonation refers to the use of explosives to open and subsequently consume the contents of the cylinder by the heat generated during the explosion. Detonation activities will be performed in accordance with the following procedures:

- All personnel involved with detonation activities shall be appropriately trained and wear PPE appropriate to the hazards (e.g. Nomex fire-retardant forearm-length gloves, other fire-retardant clothing, self-contained breathing apparatus, etc.).
- A detonation plan shall be submitted to and approved by the SH&E Manager prior to the commencement of cylinder detonation activities.
- The detonation of compressed gas cylinders will be completed under the guidance of experienced ordnance and explosives (OE) professional who is licensed in the use of explosives.
- A sufficient amount of explosives will be used to consume the entire contents of the cylinder (flammable gases only).
- A blast pit will be excavated where all detonations will take place.
- The OE professional will determine the blast hazard zone/potential debris impact zone, and this area will be evacuated prior to the detonation.
- The OE professional will sound a warning signal (e.g., horn or equivalent) three times to indicate that a detonation is imminent and confirm all persons have evacuated the blast hazard zone prior to detonation.
- Employees will be on standby outside the blast hazard zone with fire extinguishers (minimum rating of 20A:100B:C).

4.21 Cylinder Decommissioning Operations

4.21.1 Decommissioning refers to the removal of a compressed gas cylinder from service by rendering it permanently unusable.

4.21.2 Prior to decommissioning, cylinder contents will be verified, removed from the cylinder, and the cylinder purged with an inert gas (e.g., nitrogen, carbon dioxide, etc.).

4.21.3 All identifying marks or decals will be removed from the cylinder.

4.21.4 The SH&E Manager shall be contacted prior to the decommissioning of compressed gas cylinders that contain or previously contained:

- Ethylene oxide,
- Arsine,
- Diborane,
- Hydrogen selenide,
- Cyanogen chloride,
- Amines,
- Hydrogen sulfide,
- Acetylene, or
- Methyl mercaptan.

4.21.5 Additional safety precautions may be necessary due to highly reactive residues left behind by these substances.

4.21.6 The recommended methods of decommissioning include:

- Burning/torch-cutting an elongated hole into the side of the cylinder, refer to *S3AM-332-PR1 Hot Work*;
- Torch-cutting the cylinder in half; and
- Crushing the cylinder.

5.0 Records

5.1 None

6.0 Attachments

6.1 [S3AM-114-ATT1 Compressor Safety](#)

6.2 [S3AM-114-FM1 Compressed Gas Cylinder Inspection](#)

Americas

Hazardous Materials Communication

S3AM-115-PR1

1.0 Purpose and Scope

- 1.1 Provides a Hazard Communication Program so that AECOM employees are informed of the hazards of the chemicals to which they may be exposed in the course of their work by way of container labeling and other forms of warning, safety data sheets (SDS), and employee training.
- 1.2 This procedure applies to all AECOM Americas-based employees and operations and any other entity and its personnel contractually required to comply with this document's content.
- 1.3 The program applies to the use of any hazardous substances which are known to be present in the workplace in such a manner that employees may be exposed under normal conditions of use or in a foreseeable emergency.
- 1.4 The program does not apply to general consumer products, for example, cleaners, printer toner, white out, etc.

2.0 Terms and Definitions

- 2.1 **Acute Effect** – An adverse effect on the human body with immediate onset of symptoms.
- 2.2 **Article** – A manufactured item: (1) which is formed to a specific shape or design during manufacture; (2) which has end use function(s) dependent in whole or in part upon its shape or design during end use; and, (3) which does not release or otherwise result in exposure to, a hazardous chemical, under normal conditions of use.
- 2.3 **Carcinogen** – Those chemicals appearing in any of the following reference sources are established as carcinogens for hazard communication purposes:
 - National Toxicology Program (NTP) Annual Report on Carcinogens.
 - International Agency for Research on Cancer (IARC) Monographs, Volumes 1-34. Note: The Registry of Toxic Effects of Chemical Substances published by NIOSH indicates whether a substance has been found by NTP or IARC to be a potential carcinogen.
- 2.4 **Chemical Name** – The scientific designation of a substance in accordance with the nomenclature system developed by the International Union of Pure and Applied Chemistry or the system developed by the Chemical Abstracts Service.
- 2.5 **Chronic Effect** – An adverse effect on the human body with symptoms which develop slowly over a long period of time or which frequently recur.
- 2.6 **Combustible Liquid** – Any liquid having a flash point at or above 100°F (37.8°C) but below 200°F (93.3°C), except any mixture having components with flash points of 200°F (93.3°C), or higher, the total volume of which makes up 99% or more of the total volume of the mixture.
- 2.7 **Common Name** – Any designation or identification such as code name, code number, trade name or brand name used to identify a substance other than by its chemical name.
- 2.8 **Container** – Any bag, barrel, bottle, box, can, cylinder, drum, reaction vessel, storage tank or the like that contains a hazardous chemical. For purposes of this procedure, pipes or piping systems, and engines, fuel tanks, or other operating systems in a vehicle are not considered to be containers.
- 2.9 **Location** – Any separate and distinct AECOM office, laboratory or other company facility.
- 2.10 **Exposure** – Any situation arising from work operations where an employee may ingest, inhale, absorb through the skin or eyes or otherwise come into contact with a hazardous substance.
- 2.11 **Flammable** – A substance that falls into one of the following categories:

- 2.11.1 **Flammable Aerosol** – An aerosol that when tested by the method described in 16 CFR 1500.45, yields a flame projection exceeding 18 inches at full valve opening or flashback (a flame extending back to the valve) at any degree of valve opening.
- 2.11.2 **Flammable Gas** – A gas that at ambient temperature and pressure:
- Forms a flammable mixture with air at a concentration of 13% of volume or less; or
 - Forms a range of flammable mixtures with air wider than 12% by volume, regardless of the lower limit.
- 2.11.3 **Flammable Liquid** – Any liquid having a flash point below 100°F (37.8°C), except any mixture having components with flash points of 100°F (37.8°C) or higher, the total of which make up 99% or more of the total volume of the mixture.
- 2.11.4 **Flammable Solid** – A solid, including a powdered, granular or pasty mixture of a substance that is liable to cause fire through friction, absorption of moisture, spontaneous chemical change or retained heat from manufacturing or processing or which can be ignited readily and when ignited burns so vigorously and persistently as to create a serious hazard.
- Flammable Solids do not include blasting agents or explosives as defined in 8 CCR 5237(a).
- 2.12 **Flash Point** – Minimum temperature of a liquid at which it gives off sufficient vapors to form an ignitable mixture with the air near the surface of the liquid or within the container used.
- 2.13 **GHS** – The Globally Harmonized System of Classification and Labelling of Chemicals developed by the United Nations with the goal of an international system to define and classify the hazards of chemical products, and communicate health and safety information on labels and safety data sheets.
- 2.14 **Hazardous Chemical** – Those chemicals appearing in any of the following reference sources are established as hazardous chemicals for hazard communication purposes.
- 29 CFR Part 1910, Subpart Z, Toxic and Hazardous Substances, OSHA.
 - Hazardous Products Act, R.C.S. 1985, c. H-3, section 2, Canada.
 - For operations within the state of California, the list of hazardous substances prepared by the California Director of Industrial Relations pursuant to Labor Code Section 6382. The concentrations and footnotes, which are applicable to the list, shall be understood to modify the same substance on all other source lists or hazard determinations set forth in § 8 CCR 5194(d)(3)(B) and (d)(5)(D).
- 2.15 **Hazardous Substance** – A hazardous chemical or carcinogen, or a product or mixture containing a hazardous chemical or carcinogen provided that:
- 2.15.1 The hazardous chemical is 1% or more of the mixture or product or 2% if the hazardous chemical exists as an impurity in the mixture; or
- 2.15.2 The carcinogen is 0.1% or more of the mixture or product;
- 2.15.3 Manufacturers, importers and distributors will be relied upon to perform the appropriate hazard determination for the substances they produce or sell.
- 2.15.4 The following materials are not covered by the Hazard Communication Standard:
- Any hazardous waste as defined by the Solid Waste Disposal Act, as amended by the Resource Conservation and Recovery Act of 1976, as amended (42 USC 6901 et seq.) when subject to regulations issued under that act by the Environmental Protection Agency.
 - Tobacco or tobacco products;
 - Wood or wood products. Note: Wood dust is not exempt since the hazards of wood dust are not “self-evident” as are the hazards of wood or wood products;
 - Consumer products (including pens, pencils, adhesive tape) used in the work place under typical consumer usage;
 - Articles (i.e. plastic chairs);

- Foods, drugs, or cosmetics intended for personal consumption by employees while in the work place;
- Foods, drugs, cosmetics in retail store packaged for retail sale; and
- Any drug in solid form used for direct administration to the patient (i.e., tablets or pills).

Hazardous substance shall be considered the equivalent term to 'controlled substance'.

- 2.16 **Hazardous Substance Inventory (HSI) / WHMIS Log** – A listing of all chemicals stored or used at an office or project site. Note that the list may be imbedded in a project Health and Safety Plan.
- 2.17 **Immediate Use** – Means that the hazardous chemical will be under the control of and used only by the person who transfers it from a labeled container and only within the work shift in which it is transferred.
- 2.18 **National Fire Protection Association (NFPA)** – The NFPA is a trade association that issues standards and codes concerning risks associated with fire. A system of categories has been established by NFPA standard 704; colors and numbers, to provide basic hazard information concerning hazardous materials. It enables firefighters and other emergency personnel to easily decide whether or not to evacuate an area or proceed with emergency control operations. The three principal categories of identification are Health, Flammability and Instability. A numerical range of “0 to 4” indicates the severity of the hazard. A “4” indicates the most severe and a “0” indicates a minimal hazard. Refer to *S3AM-115-ATT1 Pictograms & Sample Labels* for an example.
- 2.19 **Mixture** – Any solution or intimate admixture of two or more substances which do not react chemically with each other.
- 2.20 **Reactivity** – A measure of the tendency of a substance to undergo chemical reaction with the release of energy.
- 2.21 **SDS** – A Safety Data Sheet prepared pursuant to state and federal regulations, OSHA Form 174 and Canada regulations (Hazardous Products Act & Regulation).
- 2.22 **SDS Administrator** – The individual or group designated by the Office Manager (Operations) or Project Manager to maintain the location-specific inventory list or log and the SDS binder required if that location uses or stores hazardous substances.
- 2.23 **Solubility** – The ability of substance to blend and mix uniformly with another.
- 2.24 **Specific Gravity (density)** – Ratio of the weight of a substance to the weight of the same volume of another substance. As used in this directive, specific gravity or density refers to the weight of substance as compared to the weight of an equal volume of water.
- 2.25 **Vapor Density** – The weight of a vapor-air mixture resulting from the vaporization of a volatile liquid at equilibrium temperature and pressure conditions, as compared with the weight of an equal volume of air under the same conditions.
- 2.26 **WHMIS** – The Workplace Hazardous Materials Information System (WHMIS) is Canada's national hazard communication standard. The key elements of the system are cautionary labeling of containers of WHMIS "controlled products", the provision of safety data sheets (SDSs) and worker education and training programs.

3.0 References

- 3.1 Additional definitions can be found in the Globally Harmonized System of Classification and Labelling of Chemicals (GHS), Hazardous Material Regulations (HMR), the Transportation of Dangerous Goods (TDG) Regulations, and the International Air Transport Association (IATA) Dangerous Goods Regulation (DGR).
- 3.2 S3AM-003-PR1 SH&E Training
- 3.3 S3AM-117-PR1 Hazardous Waste Operations
- 3.4 S3AM-208-PR1 Personal Protective Equipment

3.5 S3AM-209-PR1 Risk Assessment & Management

4.0 Procedure

4.1 Roles and Responsibilities

4.1.1 SH&E Manager / SH&E Department

- Audit their regional offices to confirm that they maintain a location-specific Hazardous Substance Inventory (HSI).
- Audit their regional offices to confirm that if a location-specific HSI is required, that current SDSs are available for each substance listed on the HSI.
- Provide interpretation of SDSs and hazard information for GHS labels/WHMIS labels/NFPA labels and other information to assist in training employees.
- Provide hazard communication training to AECOM employees and file documentation related to this training (e.g. trainer name, date trained, brief description of training, etc.).
- Review SDS for adequacy of completion to meet the OSHA and Canadian standard and returning them to supplier, if necessary.

4.1.2 Manager / Site Safety Officer (SSO) / Supervisor

- Have an operations-specific, written hazard communication program which at least describes how the requirements of this Procedure and the US OSHA and Canadian Hazard Communication requirements for labels and other forms of warning, safety data sheets, and employee information and training will be met.
- Appoint an SDS administrator for their location if they store or use hazardous substances.
- Confirm, if required, that the SDS Administrator maintains an HSI for their location.
- Confirm that a copy of this Procedure and the site-specific SDS are available to all employees (and/or their designated representative). Employees shall be instructed in the location of this Procedure and the SDSs.
- Confirm that all employees (including new employees) under their supervision have received the appropriate training required by this procedure prior to assigning employees to tasks involving the use of, or potential exposure to, hazardous substances.
- Notify employees of hazardous substances covered by this procedure that are used in their work area.
- Determine the potential fire, toxic, or reactivity hazards which are likely to be encountered in the handling or utilization of a hazardous substance and will communicate this information to their affected employees, before any are permitted to work with it.
- Confirm that a current SDS (is replaced as new versions are issued) is available for each hazardous substance used, or potentially encountered, in the work areas or on the projects that are under their supervision.
- Confirm hazardous substances are properly labelled.
- Notify subcontractors (working for AECOM) of any hazardous substances that are used or stored by AECOM to which the subcontractor's employees may be exposed.
- Notify clients or property owner/operators of chemicals brought onto their property by AECOM or AECOM's subcontractors.
- Request SDSs from all subcontractor organization for the relevant chemicals they bring onto an AECOM controlled site.
- Access or obtain, and maintain copies of SDS from:

- The product manufacturer or supplier;
- All AECOM subcontractors bringing chemicals onto the project site; and
- The client, for all of the client's chemicals to which AECOM or AECOM subcontract employees are potentially exposed.

4.1.3 Employee

- Confirm that they have received appropriate hazard communication training prior to working with materials that fall under the procedure.
- Only work with materials for which they have been instructed on how to find an SDS and how to work with that material safely.
- Utilize the appropriate Personal Protective Equipment (PPE) and spill containment materials as per the SDS.
- Provide a copy of all SDSs received to the SDS Administrator at their facility.
- Verify that an SDS is available in their work area for each hazardous substance that they use.

4.2 General Procedure

- 4.2.1 Confirm that containers of hazardous substances that they use are properly labelled. All employees have a right to, and should, know the properties and potential hazards of substances to which they may be exposed.
- 4.2.2 Should AECOM assign employees that do not read and speak English to tasks with chemical exposures, communications will be provided in the language understood by that employee.

4.3 Employee Information and Training

- 4.3.1 Training of employees on hazardous substances in their work area shall be conducted:
- At the time of their initial assignment;
 - Whenever a new hazardous substance is introduced into their work area; and
 - According to jurisdictional requirements (e.g., GHS, WHMIS, etc.).
- 4.3.2 As a minimum, the training requirements apply to employees in the following job categories:
- All employees who perform field work that involves the use of, shipping / receiving of, or potential exposure to, hazardous substances covered under the OSHA Hazard Communication Standard and WHMIS; and
 - Laboratory Employees.
- 4.3.3 The Initial Training will provide instruction in the following:
- Methods and observations that may be used to detect the presence or release of a hazardous substance in the work area (such as personal monitoring, visual appearance or odor of hazardous substances being released, etc.);
 - The physical and health hazards of substances in the work area and measures and procedures AECOM has implemented to protect employees; and
 - The details of this hazard communication program, including an explanation of the labelling system and the SDS, and how he/she can obtain and use appropriate hazard information;
 - Any operations in their work area in which hazardous substances are present;
 - Location and availability of this written hazard communications program (this procedure);
 - Their right to personally receive information regarding hazardous substances to which they may be exposed;

- Their right to have their physician receive information regarding hazardous substances to which they may be exposed; and
- Any relevant jurisdictional regulation, such as an employee's right against discharge or other discrimination (in California) due to the employee's exercise of rights afforded pursuant to provisions of the California Hazardous Substances Information and Training Act.

4.3.4 Periodic Training and Training for Non-Routine Tasks

Additional training will be provided to employees who have received initial training whenever:

- A new hazardous substance is introduced into their work area;
- A new or significantly increased risk has been identified related to an existing hazardous substance (e.g. as identified in an updated SDS); and
- Non-routine tasks are performed, which will potentially result in exposure to hazardous substances, or exposure under circumstances, which were not addressed during initial training.

Supervisors, in coordination with their SH&E Manager, shall provide such training through an explanation of the information on the contents of the SDS for that substance.

When training their employees, supervisors shall explain:

- Any health hazards associated with use of the substance or mixture;
- Proper precautions for handling;
- Necessary personal protective equipment or other safety precautions to prevent or minimize exposure; and
- Emergency procedures for spills, fire, disposal, and first aid.

For most projects involving field work, this periodic training requirement will be facilitated through the implementation of the site specific SH&E Plan that has been developed for the project.

4.3.5 Documentation of Initial and Periodic Training

- All training required shall be documented at the time it is performed by having the employee sign a copy of a training attendance sheet.

4.4 Hazardous Waste Exemption

4.4.1 In the U.S., hazardous wastes are excluded from the state and federal Hazard Communication standards. AECOM employees who handle or are otherwise exposed to hazardous wastes are covered by the requirements of the Resource Conservation and Recovery Act (RCRA) and other local waste related laws and regulations and the OSHA Hazardous Waste Operations and Emergency Response (HAZWOPER) standard at 29 CFR 1910.120 and *S3AM-117-PR1 Hazardous Waste Operations*.

4.5 Hazardous Substance Inventory and Chemical Usage

Establishment of a Specific Hazardous Substance Inventory (HSI) or WHMIS Log, as referenced or contained within the safe to work plan, refer *S3AM-209-PR1 Risk Assessment & Management*, shall include:

- 4.5.1 If an AECOM location uses or stores additional hazardous substances, a location-specific HSI or WHMIS Log shall be maintained at that location.
- 4.5.2 If it is determined that an office-specific HSI is needed, the Manager shall confirm that one is developed and maintained by someone appointed as the location's SDS Administrator.
- 4.5.3 The HSI or WHMIS Log may be hard copy or managed through an electronic SDS management system.

4.5.4 The content of the HSI or WHMIS Log shall be updated as new hazardous substances are procured for, or removed from the location, and shall be verified by the SH&E Manager through regular inspections of the location.

4.5.5 In order to meet the 30-years-after-employment-termination record retention requirement, the office or project specific HSIs shall be managed as a permanent record.

Prior to using any chemical, a Task Hazard Analysis (THA) shall be completed by the employees assigned to use the chemical. The analysis will identify the hazards associated with the chemical (e.g. review the SDS to identify carcinogens or extremely hazardous chemicals), the tasks to be performed, and prescribe the Personal Protective Equipment (PPE) to be used, refer to *S3AM-208-PR1 Personal Protective Equipment*.

4.6 Safety Data Sheets (SDS)

4.6.1 Location-Specific SDS Inventory

- If it is determined that an AECOM location is required to maintain a location-specific inventory SDSs for the specific hazardous substances shall be maintained on file at that location.
- The SH&E Manager shall audit the local office or project for SDS request and maintenance and report deficiencies to the appropriate management level, as necessary, to confirm compliance with this procedure.

4.6.2 Field Project Sites and Client Facilities

- The Project Manager and/or the Site Safety Officer shall access or obtain, and maintain copies of SDS from:
 - The product manufacturer or supplier;
 - All AECOM subcontractors bringing chemicals onto the project site; and
 - The client, for all of the client's chemicals to which AECOM or AECOM subcontract employees are potentially exposed.

4.6.3 Employee Access to SDSs

SDSs should be maintained at the local location that uses that hazardous substance. Copies of this program and the SDS should be made available to the employee upon request to the office's SDS Administrator.

4.6.4 Field Access to SDSs

When hazardous substances are brought into the field, the user shall confirm that a copy of the SDS for that substance accompanies it and is available at the field location where it is to be used.

4.6.5 SDSs for AECOM Products

It is unlikely that AECOM activities would create a chemical for which a new SDS were needed. If such a chemical were created, the SH&E Department shall work with the appropriate operations groups to draft, review, and publish the new SDS.

4.6.6 Content of the SDS:

- Safety Data Sheets, previously referred to as Material Safety Data Sheets, will now require a 16-section format that is essentially the same as the ANSI standard for Hazardous Workplace Chemicals-Hazard Evaluation and Safety Data Sheets and Precautionary Labeling Preparation (ANSI Z400.1 & Z129.1 – 2010).
- Section 1, Identification includes product identifier; manufacturer or distributor name, address, phone number; emergency phone number; recommended use; restrictions on use.
- Section 2, Hazard(s) identification includes all information regarding the hazards of the chemical and the appropriate warning information associated with the hazards including classification, signal word, hazard statement, pictograms, and precautionary statement.

- Section 3, Composition/information on ingredients includes information on chemical ingredients; trade secret claims.
- Section 4, First-aid measures includes important symptoms/ effects, acute, delayed; required treatment.
- Section 5, Fire-fighting measures lists suitable extinguishing techniques, equipment; chemical hazards from fire.
- Section 6, Accidental release measures lists emergency procedures; protective equipment; proper methods of containment and cleanup.
- Section 7, Handling and storage lists precautions for safe handling and storage, including incompatibilities.
- Section 8, Exposure controls/personal protection lists OSHA's Permissible Exposure Limits (PELs); Threshold Limit Values (TLVs); appropriate engineering controls; personal protective equipment (PPE).
- Section 9, lists the physical and chemical properties of the hazardous substance.
- Section 10, Stability and reactivity lists chemical stability and possibility of hazardous reactions.
- Section 11, Toxicological information includes routes of exposure; related symptoms, acute and chronic effects; numerical measures of toxicity.
- Section 12, Ecological information
- Section 13, Disposal considerations
- Section 14, Transport information
- Section 15, Regulatory information
- Section 16, Other information, includes the date of preparation or last revision.

SDSs that do not contain this information shall be returned to the distributor or manufacturer to be updated.

4.6.7 Trade Secrets

Some hazardous substance suppliers may claim the information requested on SDSs is proprietary and not provide the information to AECOM.

When SDSs supplied to the SH&E Manager indicate that proprietary information has been withheld, the SH&E Manager will either obtain the necessary information to make a hazard assessment or reject the material for use within AECOM.

4.6.8 For Canadian operations, all relevant SDS shall be current (no more than 3 years old) and readily available (in French and English) for all hazardous materials.

4.7 Labeling

4.7.1 Containers of hazardous substances used or stored in each AECOM location shall be labeled, tagged or marked with the following information:

- Product name or Identifier;
- Hazard Pictogram;
- Signal Word;
- Physical, Health, Environmental Statements;
- Supplemental Information;
- Precautionary Measures and Pictograms;

- First Aid Statements;
- Name and Address of Company; and
- Telephone Number.

4.7.2 Refer to *S3AM-115-ATT1 Pictograms & Sample Labels*.

4.7.3 Labels on containers shall not be removed or defaced. Labels or other forms of warning shall be legible, in English and French (Canada), and prominently displayed on the container.

4.7.4 Formal and informal inspections shall include observing that hazardous materials are properly labeled.

4.7.5 Immediately replace lost or illegible labels provided the product can be conclusively identified. Any failure to have the appropriate labeling information on a container at any time, or illegible or missing labels will be cause to suspend use of the product until the product is conclusively identified and is properly labeled.

4.7.6 Carcinogen Labeling

Chemicals which have been indicated as positive or suspect carcinogens by either OSHA, ACGIH, the International Agency for Research on Cancer (IARC) (World Health Organization), or the National Toxicology Program (NTP) will be considered to be carcinogenic for purpose of the HCS.

4.7.7 Stationary Process Containers

If there is stationary process equipment within a work area (e.g., vessels, piping systems, etc.), signs, placards, pictograms, process sheets, batch tickets, operating procedures, or other such written materials may be used in lieu of fixed labels on the containers, as long as the alternative method conveys the appropriate hazard information. The written materials shall be readily accessible to the employees in the work area.

4.7.8 Portable Containers

Portable containers of hazardous substances need not be labelled when the substance is transferred from labelled containers and will be used immediately by the employee who performs the transfer, however the container shall still contain the product identifier (name). Immediate use means the container will remain in the employee's immediate possession and direct oversight until the container is fully emptied or contents are returned to a labelled container.

Containers of hazardous substances transferred from labelled containers and not intended for the immediate use of the employee performing the transfer shall be labelled with the chemical name and a hazard warning label meeting workplace label requirements in accordance with the OSHA Hazard Communication Standard or WHMIS (as applicable to the given jurisdiction).

4.8 Chemical Storage

4.8.1 Hazardous chemicals are to be stored in labeled containers with the lids securely closed using appropriate undamaged caps or lids. Confirm liners are in place if used.

4.8.2 Flammable and combustible materials shall be stored in fire impervious cabinets in designated stockroom areas. Chemicals shall be stored in compliance with instructions provided on their labels, SDS, or the manufacturer's specifications (e.g. compatibility with other substances, environmental conditions, etc.).

NOTE: Flammable gases or other compressed gases should not be stored in flammable material cabinets as these cabinets are not designed for containment of pressurized gases.

4.8.3 All hazardous chemicals shall be stored in a manner that prevents spillage and leakage from exposing people or the environment to the chemical.

4.8.4 Hazardous chemicals shall not be stored with foods or beverages. Food and beverages shall not be consumed in areas where hazardous chemicals are used or stored.

4.9 Chemical Use in Offices

- 4.9.1 In general, hazardous substances should not be taken into office areas, conference rooms, or break areas, contact the SH&E Manager for guidance if this general requirement is infeasible.
- 4.9.2 General exceptions to this rule are the following:
- Liquid paper;
 - Toner;
 - Cleaners;
 - Isobutylene calibration gas; and
 - pH calibration solutions for instruments.
- 4.9.3 Each office or location using or storing hazardous materials will develop a written office/ location-specific Hazard Communication/WHMIS Program.
- 4.9.4 If the local office decides to implement the requirements of the standard in any way that differs from this procedure, they shall verify the changes with the SH&E Manager, document the changes, and communicate the differences to all affected employees.

4.10 Canada-specific

- 4.10.1 Consumer products are exempt from supplier labels and SDS requirements. Some cleaning solvents may be packaged as consumer products and these shall be labeled in accordance with the Consumer Product Act requirements.
- 4.10.2 In addition to the labelling of storage containers in the workplace, the contents of process piping (including valves), process vessels and reaction vessels are required to be identified through the use of colour coding, labels, placards or other modes of identifications that shall be communicated to workers through training programs. It is important for employees to be aware of and understand Client labelling requirements for these types of process systems.

5.0 Records

- 5.1 HSI or WHMIS Logs shall be retained in project or office files for a minimum of 30 years or according to jurisdictional requirements.
- 5.2 Training documentation shall be retained in accordance with *S3AM-003-PR SH&E Training*.

6.0 Attachments

- 6.1 S3AM-115-ATT1 Pictograms & Sample Labels

Americas

Hearing Conservation

S3AM-118-PR1

1.0 Purpose and Scope

- 1.1 Establishes procedures to confirm that personal noise exposure remains within acceptable limits and establishes the requirements of an acceptable hearing conservation program.
- 1.2 This procedure applies to all AECOM Americas-based employees and operations and any other entity and its personnel contractually required to comply with this document's content.

2.0 Terms and Definitions

- 2.1 **ABC System** – The system used in Canada to classify hearing protectors on the basis of the attenuation provided by the hearing protection.
- 2.2 **Action Level** – May also be referred to as **Monitoring Level**. An eight-hour, time-weighted average established by the applicable jurisdiction, measured on the A-scale, slow response. Depending upon jurisdiction, this can vary anywhere from 74dBA to 85dBA, and may additionally be defined as 50% of the allowable noise dose. In the absence of a specified jurisdictional action level, 85dBA shall be used as the default action level.
- 2.3 **Attenuation** – The reduction of the sound level at the ears of a person wearing hearing protectors.
- 2.4 **Decibel (dB)** – Logarithmic unit of measurement of sound level.
- 2.5 **Established Exposure Limit** – The maximum regulatory noise exposure to which an individual may be exposed to for an 8- hour time weighted average (TWA).
 - This limit is referred to by different terminology depending upon the given jurisdiction (e.g. Permissible Exposure Limit (PEL), Contamination Limit, Occupational Exposure Limit (OEL), Threshold Limit Value (TLV), etc.).
 - Acceptable methods of adjusting this limit to correspond to a different exposure period (e.g. 10 hours) vary by jurisdiction.
- 2.6 **Standard Threshold Shift (STS)** – When one's hearing threshold has changed (relative to the baseline audiogram) an average of 10 dB or more at 2000, 3000, or 4000 Hz in either ear).
- 2.7 **Noise Reduction Rating (NRR)** – The measure, in decibels, of how well a hearing protector reduces noise (attenuation), as specified by the United States of America Environmental Protection Agency. It is a requirement in the USA that all hearing protectors have the NRR stamped on their packaging.
- 2.8 **Time-Weighted Average (TWA) Sound Level** – That sound level, which if constant over an 8-hour exposure, would result in the same noise dose as is measured.

3.0 References

- 3.1 S3AM-003-PR1 SH&E Training
- 3.2 S3AM-127-PR1 Exposure Monitoring
- 3.3 S3AM-128-PR1 Medical Screening & Surveillance

4.0 Procedure

- 4.1 Roles and Responsibilities
 - 4.1.1 **SH&E Manager**
 - Provide access to initial and refresher hearing conservation training.

Hearing Conservation (S3AM-118-PR1)
Revision 1 July 31, 2019

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1 of 6

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- Inform employees of noise monitoring results when full-shift noise exposure is at or above the action level.
- Designate areas and tasks where employees' exposure is at or above the action level.
- Conduct noise monitoring and supervise noise surveys, as applicable, and support hazardous noise assessment/evaluation efforts.

4.1.2 **Manager**

- Implement the hearing conservation program.
- Confirm that a hazardous noise assessment/evaluation has been conducted.
- Confirm that a hazardous noise assessment/evaluation is conducted when a change in equipment, procedures, or personnel may increase employee exposure to noise.
- Implement engineering controls to reduce noise levels when such measures are considered feasible and when required by regulation.
- Purchase, monitor, and replenish for employees' use, a supply of hearing protection devices with a minimum Noise Reduction Rating (NRR) of 26 dBA, or of the appropriate classification for the applicable jurisdiction.
- Confirm that individuals included in the program receive training and that the training meets the criteria outlined in this program.
- Investigate and implement corrective action to all reports of non-conformance with this procedure, including reports of standard threshold shifts or employees' failure to wear hearing protectors in designated areas.
- Maintain an awareness of the noise levels in work areas for which he/she is responsible.
- Place warning signs in areas where sound levels would require the use of hearing protectors.
- Request that a hazardous noise assessment/evaluation be conducted when a change in equipment, procedures, or personnel may increase employee exposure to noise above action levels.
- Confirm that all employees are aware of the requirements for hearing protection for any designated area or task.
- Enforce the use of hearing protection by employees in designated areas and for designated tasks.

4.1.3 **Employee**

- Comply with the requirements of the Hearing Conservation program.
- Wear hearing protection devices in designated areas or for designated tasks.
- Inspect and maintain hearing protection devices.
- Report any suspected change in noise levels of work area to supervisor.
- Report any signs or symptoms experienced that could be the result of overexposure to noise to supervisor.
- Participate in audiometric testing and hearing protection training when required.

4.2 **General Requirements**

- 4.2.1 The requirements of this procedure apply to all locations/facilities/projects where employee noise exposure may equal or exceed the action level.
- 4.2.2 SH&E Plans and Task Hazard Assessments (THA) shall identify applicable hazards related to noise exposure. Identify established exposure limits and action levels specified by the applicable jurisdiction, or in the absence of specifications, an 8-hour TWA of 85 dBA.



- The below chart is intended to provide basic established exposure limits by jurisdiction. Please consult the applicable jurisdictional legislation to obtain further information and to verify accuracy.

	8hr TWA Established Exposure Limit (dBA)	8hr TWA Action Level (dBA)
OSHA	90	85
Canada - Federal	87	74
Alberta	85	85
British Columbia	85	82
Manitoba	85	80
New Brunswick	85	80
Newfoundland	85	85
Northwest Territories	85	80
Nova Scotia	85	85
Nunavut	85	85
Ontario	85	85
Prince Edward Island	85	85
Quebec	90	85
Saskatchewan	85	80
Yukon	85	80

- Acceptable methods of adjusting this limit to correspond to a different exposure period (e.g. 10 hours) vary by jurisdiction.
- 4.2.3 When processes or areas present noise exposures that are or could be at or above the action level identified for the given jurisdiction, monitoring and interpretation of results shall be undertaken by a trained and competent individual using approved equipment (sound level meters, sound dosimeters) to assess the hazard.
- 4.2.4 Resulting documentation (e.g. noise maps, results of the sound level survey data, etc.) will be posted at the location.
- 4.2.5 Noise assessments shall be repeated when there is any change in processes or equipment that could affect the noise level or the exposure duration.
- 4.2.6 Eliminate noise sources or reduce noise levels to the extent possible prior to implementing hearing protection PPE. Examples of controls that shall be considered include:
- Adding or replacing mufflers on motorized equipment.
 - Adding mufflers to air exhausts on pneumatic equipment.
 - Following equipment maintenance procedures to lubricate dry bearings and replace worn or broken components.
 - Isolating loud equipment with barriers.
 - Replacing loud equipment with newer and quieter models.
 - Using caution signs and Hearing Protection Required signs to designate noisy work areas.
 - Installing hearing protection device-dispensing stations at the entrance to noisy work areas.
- 4.2.7 Where practicable, a clearly visible warning sign shall be posted at every approach to an area in the workplace where the sound level regularly exceeds 85 dBA.

4.3 Hearing Protectors

- 4.3.1 Hearing protectors will be used in the event that administrative or engineering controls are either not effective or not feasible.
- 4.3.2 Selection of appropriate hearing protectors shall be based on actual or anticipated exposure levels, the attenuation provided by the device, and the manufacturer's information about the use and limitations of the device.
- 4.3.3 At a minimum, hearing protectors shall provide a level of protection that brings actual or anticipated exposure below the established exposure limit for the applicable jurisdiction. Additional information relative to hearing protector use is as follows:
- The use of hearing protectors is required in any location where powered or motorized equipment, portable tools or any other noise source could reasonably be expected to exceed noise levels specified by the applicable jurisdiction, or in the absence of specifications, an 8-hour TWA of 85 dBA.
 - Hearing protection will be mandatory for all employees working in any area that has not been evaluated for noise exposure and the ambient noise level in the area is such that a raised voice is necessary to have a normal conversation with someone less than three feet (1 meter) away, and/or when within 25 feet (7.6 meters) of an operating piece of heavy equipment.
 - Hearing protection will be mandatory for all employees who work on or near heavy equipment unless personal dosimetry or other techniques have been used to document actual exposure.
 - Hearing protectors will be made available to all employees at no cost to the employees who may be exposed to noise levels specified by the applicable jurisdiction, or in the absence of specifications, an 8-hour TWA of 85 dBA.
 - Hearing protection will be mandatory for all employees exposed to 85 dBA for any period of time and who have experienced an STS.
 - Whenever information indicates that any employee's exposure may equal or exceed specified levels (or as applicable, an 8-hour TWA of 85 dBA), the manager will be responsible for enforcing the proper use of hearing protectors.
 - At least two types of hearing protectors shall be available to employees free of charge, and the type of hearing protector shall be suitable to the task and approved to the applicable jurisdiction.
 - Hearing protectors shall be used in accordance with manufacturer's specifications to effectively protect hearing. Refer to *S3AM-118-ATT1 Hearing Protection Guidelines*.
- 4.3.4 Evaluate the effectiveness of the hearing protectors chosen.
- 4.3.5 The manufacturer's assigned noise reduction rating (NRR) or attenuation for hearing protection devices can seldom be achieved in workplace conditions; therefore this rating shall be adjusted for real world conditions and use.
- For devices with an NRR rating, subtract 7 from the NRR of the protector provided by the manufacturer. Divide this result by 2, and then subtract the remained from the observed "A" scale sound level measurement collected in the employee's work area (see Section 4.B). If this number is below 85, the hearing protectors are adequate for use in the work area.
- 4.3.6 Implement a hearing conservation program as applicable and in accordance with jurisdictional requirements
- #### 4.4 Training
- 4.4.1 All employees with potential exposure above the action levels applicable to their jurisdiction, or who otherwise utilize any type of hearing protector will participate in a hearing conservation training program. Refer to *S3AM-003-PR1 SH&E Training*.

- 4.4.2 The initial and subsequent annual hearing conservation training will address, at a minimum, the following topics:
- The effects of noise on hearing, recognizing hazardous noise, and symptoms of overexposure to hazardous noise.
 - When and/or where hearing protectors are required to be worn.
 - The purpose of hearing protectors.
 - The advantages, disadvantages, and effectiveness of various types of protectors.
 - Instructions on care and use of hearing protectors, including its limitations, proper fitting, inspection and maintenance and, if applicable, the cleaning and disinfection of the protector.
 - The purpose of audiometric testing, including an explanation of the test procedures.
 - Hearing Conservation Program requirements and responsibilities.
- 4.4.3 Hearing protection training is conducted annually for all affected employees or more frequently for employees who do not properly use hearing protectors or otherwise fail to comply with this policy.

4.5 Audiometric Testing

- 4.5.1 All AECOM personnel with exposure greater than the action level shall be enrolled in the medical surveillance program and undergo a baseline audiogram within 6 months of the first exposure (consult local jurisdiction for more stringent timelines).
- 4.5.2 Thereafter, annual audiograms will be compared with the baseline exam. Testing to establish a baseline audiogram will be preceded by 14 hours without exposure to noise, including noise exposure away from work. Hearing protectors may be used as a substitute for the requirement that a baseline audiogram will be preceded by 14 hours without exposure to noise.
- 4.5.3 Enrolled employees will receive audiograms during their exit physicals; refer to *S3AM-128-PR1 Medical Screening & Surveillance Program*.
- Audiometric tests will be performed by a person meeting the requirements specified by the applicable jurisdiction.
 - The medical surveillance provider will notify employees of the need to avoid high levels of non-occupational noise exposure during the 14-hour period immediately preceding the audiometric examination.
 - For multi-year projects, an annual audiogram will be obtained for each employee exposed at or above the level specified by the applicable jurisdiction, or in the absence of specifications, an 8-hour TWA of 85 decibels.
- 4.5.4 Each employee's annual audiogram will be compared to that employee's baseline audiogram to determine if the audiogram is valid, and if there is a standard threshold shift (STS).
- 4.5.5 When a Standard Threshold Shift (STS), as identified by the AECOM Medical Consultant, is noted between the last valid baseline and the annual audiogram, the following steps will be taken:
- A retest will be conducted within 30 days to confirm the STS. The employee will not be exposed to workplace/hobby noise for 14 hours or will be provided with adequate hearing protection prior to testing.
 - If the STS persists, ear protection will be evaluated and refitted, and may be upgraded to one with a greater NRR or classification. The hearing protection will have a minimum NRR of 26 dBA, or be of the appropriate classification for the applicable jurisdiction.
 - The employee will be counselled and AECOM will obtain information regarding the employee's possible noise exposure away from the workplace or existing ear pathology.
 - Qualified medical personnel will review the audiograms. This group will determine the need for a medical referral.

- The employee will be notified in writing by either the **SH&E Manager** or the AECOM Medical Provider of the STS, within 21 days of determination, or as required by the applicable jurisdiction.
 - The employee's supervisor will be notified of the shift in hearing threshold.
- 4.5.6 An employee who has experienced an STS shall comply with any recommendations made by medical personnel as they relate to the employees assigned work duties (e.g. dual hearing protection of earplugs and earmuffs).
- 4.6 Employee Monitoring
- 4.6.1 When information indicates that any employee's exposure may equal or exceed the applicable action level, the SH&E Manager shall develop and implement a site-specific monitoring program to identify employees for inclusion in the hearing conservation program and to enable the proper selection of hearing protectors. Refer to *S3AM-118-FM1 Site-Specific Hearing Conservation Program* and *S3AM-127-PR1 Exposure Monitoring*.
- 4.6.2 Noise surveys shall be conducted in a manner that reasonably reflects the exposure of the affected employees. Surveys shall be conducted under the supervision of an AECOM SH&E Manager. Refer to *S3AM-118-FM2 Sound Level Survey* and *S3AM-118-FM3 Noise Dosimetry Record*.
- 4.6.3 Sound-level meters and audio dosimeters used to determine employee exposure to noise sources shall be Type II (accurate to within +/- 2 dBA), operated in "slow" response, on the "A" scale, and be calibrated to factory guidelines (including periodic factory recalibration).

5.0 Records

- 5.1 Noise exposure measurement records, surveys and Site-Specific Hearing Conservation Plans will be retained at the project/facility for the duration of the project.
- 5.2 Audiogram records will be retained in the employee's medical records as per *S3AM-128-PR1 Medical Screening & Surveillance Program*.
- 5.3 Employee training session documentation will be retained in accordance with *S3AM-003-PR1 SH&E Training*.

6.0 Attachments

- 6.1 [S3AM-118-ATT1 Hearing Protection Guidelines](#)
- 6.2 [S3AM-118-FM1 Site-Specific Hearing Conservation Program](#)
- 6.3 [S3AM-118-FM2 Sound Level Survey](#)
- 6.4 [S3AM-118-FM3 Noise Dosimetry Record](#)

Americas

Exposure Monitoring

S3AM-127-PR1

1.0 Purpose and Scope

- 1.1 This procedure applies to the operations of AECOM and its subsidiary companies, and any other entity and its personnel contractually required to comply with this document's content, where employees may be exposed to airborne concentrations of hazardous air contaminants potentially exceeding permissible limits. Note that this standard does not cover monitoring for asbestos operations (S3AM-109-PR1), toxic and hazardous substances (S3AM-110-PR1), radiation (S3AM-120-PR1), non-ionizing radiation (S3AM-121-PR1), confined spaces (S3AM-301-PR1), heat stress (S3AM-113-PR1), or noise (S3AM-118-PR1).
- 1.2 The purpose of this procedure is to assist and provide guidance to AECOM personnel who need to conduct personal industrial hygiene monitoring and to control employee exposures to toxic or hazardous substances to the lowest level practicable, including those specified under applicable jurisdictional legislation. Monitoring will be conducted to evaluate the potential exposure of AECOM employees to airborne concentrations of hazardous particulates, fibers, gases, vapors, mists, pathogens, hazardous biological agents, or to oxygen-deficient atmospheres.
- 1.3 Personal monitoring shall be conducted under the following conditions:
- 1.3.1 Where directed by a facility or site-specific health and safety plan.
 - 1.3.2 Where employees are exposed to known or suspected human carcinogens (e.g., beryllium, vinyl chloride, etc.).
 - 1.3.3 Where regulations require "initial exposure assessments" (e.g., lead, asbestos, methylene chloride, hexavalent chromium). Certain regulations allow for an exemption to initial exposure assessments when exposure monitoring of similar exposure groups has been conducted under the same site conditions and for equivalent tasks within 1 year prior to the start of work on the current project or site.
 - 1.3.4 When directed by a client or required by contract.
 - 1.3.5 At the direction of a Safety Manager in response to employee concerns or incidents involving chemical exposure.
 - 1.3.6 Co-sampling during regulatory inspections.
 - 1.3.7 Routine monitoring in compliance with regulatory requirements.

2.0 Terms and Definitions

- 2.1 **Action Level (AL)** – An airborne concentration of a potentially toxic or hazardous substance, measured in parts per million by volume (ppm), microgram per cubic meter ($\mu\text{g}/\text{m}^3$) milligram per cubic meter (mg/m^3) or fibres per cubic centimetre (f/cc), that triggers certain provisions as required by the applicable jurisdictional legislation. In many cases the action level is 50% of the established exposure limit.
- 2.2 **Established Exposure Limit** – The maximum regulatory exposure concentration to which an individual may be exposed to for an 8- hour time weighted average (TWA).
- This limit is referred to by different terminology depending upon the given jurisdiction (e.g. Permissible Exposure Limit (PEL), Contamination Limit, Occupational Exposure Limit (OEL), Threshold Limit Value (TLV), etc.).

Acceptable methods of adjusting this limit to correspond to a different exposure period (e.g. 10 hours) vary by jurisdiction and substance.

3.0 References

- 3.1 S3AM-109-PR1 Asbestos
- 3.2 S3AM-301-PR1 Confined Spaces
- 3.3 S3AM-113-PR1 Heat Stress
- 3.4 S3AM-118-PR1 Hearing Conservation
- 3.5 S3AM-123-PR1 Respiratory Protection
- 3.6 S3AM-110-PR1 Toxic & Hazardous Substances

4.0 Procedure

- 4.1 Implementation of this standard is the responsibility of the AECOM manager directing activities of the facility, site, or project location.
- 4.2 Hazard assessments shall be completed to identify potential employee exposure to toxic or hazardous substances. Industrial hygiene monitoring conducted and prioritized as appropriate to the potential risk and in accordance with regulatory requirements.
- 4.3 Procedures for Personal Industrial Hygiene Monitoring
 - 4.3.1 Personal industrial hygiene monitoring documentation shall include accurate and detailed descriptions of the work environment and of the work activities of each employee being monitored to evidence monitoring results are tied to the work operations conducted. This permits demonstration that suggested corrective actions are appropriate or adequate to control the exposure.
 - 4.3.2 Individuals responsible for equipment maintenance and collection shall be appropriately trained. Engage applicable subject matter experts as necessary (e.g., industrial hygienists / technicians).
 - 4.3.3 Maintain, service, and calibrate sampling equipment in accordance with the manufacturer's recommendations and, as applicable, the approved sampling methodology (may include both pre- and post-calibration to confirm consistent flow rates).
 - 4.3.4 Collect samples using current applicable methodologies established by the National Institute for Occupational Safety and Health (NIOSH) *Manual of Analytical Methods*, U.S. Department of Labor – Occupational Safety and Health Administration (OSHA) *Sampling and Analytical Methods*, American Society for Testing Materials (ASTM), the Environmental Protection Agency (EPA), or applicable guidelines for the host country.
 - 4.3.5 Select an analytical laboratory accredited by the American Industrial Hygiene Association (AIHA), or equivalent host country certification, licensing, or accreditation, to analyze the personal air samples.
Note: There are several programs under which a laboratory may receive AIHA accreditation. The laboratory shall be currently accredited for the specific program, scope category, and field of testing for the analysis that will be performed, not merely hold AIHA accreditation.
 - 4.3.6 Confirm samples are submitted to the laboratory for analysis in a timely manner to confirm sample viability.
 - 4.3.7 Require the selected laboratory to use the applicable analytical methodologies and document quality control procedures.
 - 4.3.8 Confirm equipment is maintained, serviced, and calibrated in accordance with manufacturer's recommendations.



- 4.3.9 Document personal monitoring activities and work operations using the appropriate AECOM Industrial Hygiene Monitoring Form; require that all laboratory chain-of-custody forms be properly completed; and confirm samples are sealed and secured according to Quality Assurance procedures.
- 4.3.10 Confirm workers are being protected (e.g., engineering controls, administrative controls, and PPE, including respiratory protection) during the monitoring phase. Refer to *S3AM-123-PR1 Respiratory Protection* and *S3AM-208-PR1 Personal Protective Equipment*.
- 4.3.11 Reassessment of exposure hazards shall be conducted as appropriate when there are changes in conditions or work processes, and at suitable intervals based on potential risk and regulatory requirements.
- 4.3.12 Determine whether medical surveillance is required. Refer to jurisdictional requirements and *S3AM-128-PR1 Medical Screening & Surveillance*.
- 4.4 Evaluation of Personal Monitoring Results
 - 4.4.1 Samples sent out for independent laboratory analysis will follow chain of custody requirements.
 - 4.4.2 An AECOM Certified Industrial Hygienist (CIH) approved by a Safety Manager should evaluate the analytical results when feasible.
 - 4.4.3 Obtain a written evaluation report from the SH&E manager. If exposures exceed the Action Level and/or Established Exposure Limit for the air contaminant(s) of concern, a verbal report is to be made to the senior facility, project, or site manager immediately, and follow up with the written report within any established timeframe. The evaluation report will include required corrective actions.
 - 4.4.4 Complete evaluation reports within 5 working days of the receipt of the analytical results.
 - 4.4.5 Results of all personal exposure monitoring will be provided to the SH&E department for inclusion in the employee medical records, refer to *S3AM-017-PR1 Injury & Illness Recordkeeping*.
- 4.5 Procedures for Direct-Read Air Monitoring
 - 4.5.1 Direct-read air monitoring instruments are used primarily as screening tools to provide real-time evaluations of hazardous airborne contaminants at a project site.
 - 4.5.2 Select an appropriate air monitor for the air contaminant to be measured.
 - 4.5.3 Calibrate monitor in accordance with manufacturer's recommendations. Dates of full instrument calibration will be recorded on the direct-read instrument and on any associated calibration data sheets. If instrument calibrations are not performed daily, then daily bump tests (exposure to a known concentration of contaminant) will be performed to verify calibration and confirm alarms are working appropriately.
 - 4.5.4 Conduct air monitoring using techniques identified by the instrument manufacturer and according to any identified methods (e.g. NIOSH, EPA, etc.).
 - 4.5.5 Confirm equipment is maintained, serviced, and calibrated in accordance with manufacturer's recommendations.
 - 4.5.6 Document personal monitoring activities using the appropriate AECOM Industrial Hygiene Monitoring Form.
 - 4.5.7 Confirm workers are being protected (e.g., engineering controls, administrative controls, and PPE, including respiratory protection) during the monitoring phase. Determine whether medical surveillance is required.
 - 4.5.8 Where required by client request or by unique or high hazard areas, individual portable direct-read monitors shall be used.

4.6 Evaluation of Personal Monitoring Results

4.6.1 Compare measured results with project-specific Action Levels and/or published Established Exposure Limits. If exposures exceed the Action Level and/or Established Exposure Limit for the air contaminant(s) of concern, take corrective actions as identified in the site-specific SH&E plan. If the SH&E Plan did not account for the identified hazard, or where questions exist about the results, contact the SH&E Manager to evaluate the analytical results for appropriate corrective action (this may involve consultation with a Certified Industrial Hygienist). The SH&E Plan should be updated accordingly.

4.7 Communication of Sample Results and Evaluation

4.7.1 Provide copies of the evaluation report to the employee(s) monitored and to employees working in the area for which the exposures could be representative, within 5 days of receipt of lab results.

4.7.2 Exposure results will be posted on site and explained in a safety briefing.

4.7.3 Provide a copy of the evaluation report and monitoring data to the client, owner, or manager directing activities of the facility or site for filing purposes.

4.7.4 Personal identifiers (e.g., name, address, employee number) or information which could reasonably be used to identify specific employees (e.g., exact age, height, weight, race, sex, date of initial employment, job title), shall be removed from analysis reports before access to the exposure data is provided.

4.8 Corrective Actions

4.8.1 Implement required corrective actions immediately.

4.8.2 If the exposure hazard cannot be eliminated or otherwise controlled through the use of engineering controls, the reason shall be documented and suitable administrative controls and personal protective equipment requirements developed.

4.8.3 Workers who may be exposed above the Established Exposure Limit or Action Limit, shall be appropriately trained and wear respiratory protection in accordance with *S3AM-123-PR1 – Respiratory Protection Program*.

4.9 Exposure Records

4.9.1 Exposure records include work activities / process descriptions, workplace monitoring, biological monitoring, material safety data sheets and chemical inventories. Sampling results, the collection methodology (sampling plan), a description of the analytical and mathematical methods used, and a summary of other background data relevant to interpretation of the results obtained, shall be retained for at least thirty (30) years.

5.0 Records

The following documents will be maintained in the project profile:

5.1 Calibration data.

5.2 Completed IH Monitoring Form(s).

5.3 Evaluation Report with sample results (provide copy to affected employee as well).

5.4 Corrective actions, including engineering controls.

5.5 Relevant prior initial exposure assessments.

6.0 Attachments

6.1 [S3AM-127-FM1 General Industrial Hygiene Survey](#)

- 6.2 [S3AM-127-FM2 Industrial Hygiene Sample Field Sheet](#)
- 6.3 [S3AM-127-FM3 Total Dust Industrial Hygiene Sample Field Sheet](#)
- 6.4 [S3AM-127-FM4 Respirable Dust Industrial Hygiene Sample Summary](#)
- 6.5 [S3AM-127-FM5 Detector Tube Industrial Hygiene Sample Summary](#)
- 6.6 [S3AM-127-FM6 Gas/Vapor/Fume/Mist Industrial Hygiene Sample Summary](#)
- 6.7 [S3AM-127-FM7 Toxic Gas Monitor Industrial Hygiene Sample Summary](#)
- 6.8 [S3AM-127-FM8 PID/FID Monitoring Report](#)
- 6.9 [S3AM-127-FM9 Industrial Hygiene Evaluation Form](#)
- 6.10 [S3AM-127-FM10 Instrument Calibration Log](#)

Americas

Medical Screening & Surveillance

S3AM-128-PR1

1.0 Purpose and Scope

- 1.1 Provides a streamlined process to determine if employees meet the physical requirements to perform assigned duties as defined by applicable regulations.
- 1.2 Designed to provide a means to collect data relevant to exposure to chemical and physical agents for the protection of the workers and to confirm the effectiveness of health and safety programs.
- 1.3 Applies to all AECOM Americas employees and operations and any other entity and its personnel contractually required to comply with this document's content.

2.0 Terms and Definitions

- 2.1 **Employee Exposure Record** - A record containing any of the following kinds of information:
 - Environmental (workplace) monitoring or measuring of a toxic substance or harmful physical agent, including personal, area, grab, wipe or other form of sampling, as well as related collection and analytical methodologies, calculations and other background data relevant to interpretation of the results obtained.
 - Biological monitoring results which directly assess the absorption of a toxic substance or harmful physical agent by body systems (e.g., the level of a chemical in the blood, urine, breath, etc.), but not including results which assess the biological effect of a substance or agent or which assess an employee's use of alcohol or drugs.
 - Safety data sheets indicating that the material may pose a hazard to human health.
 - In the absence of the above, a chemical inventory or any other record which reveals where and when used and the identity (e.g., chemical, common, or trade name) of a toxic substance of harmful physical agent
- 2.2 **Medical Director** – A physician, board-certified in occupational medicine, employed by the Medical Services Provider (MSP). The Medical Director manages the services provided by the MSP and provides to AECOM guidance on medical matters.
- 2.3 **Medical Services Provider (MSP)** – Manages all occupational medical services, including medical surveillance programs, travel medicine, documentation, and injury intervention for first aid support for employees with occupational injuries or illnesses.
- 2.4 **Participating Employee** – Those employees required to participate in the medical screening and surveillance program will be identified by the Supervisor, Operations and SH&E Manager. Medical surveillance is required for employees who are or may be:
 - Exposed to substances at or above the occupational exposure limits.
 - Required to participate by regulatory provisions (e.g., asbestos, lead OSHA standards, designated substances).
 - Fit-tested for or wearing a respirator in the field.
 - Working on sites/projects with specific state, provincial/territorial or federal medical surveillance requirements.
 - Driving a commercial motor vehicle.
 - Performing safety sensitive tasks.

- 2.5 **Physical Activity Restriction** – To prevent aggravation of an existing condition, the Medical Doctor recommends a physical activity restriction to limit exposure to a chemical or class of chemicals (e.g., benzene, lead), a physical agent (e.g., noise), or an activity (e.g., heavy lifting).

3.0 References

- 3.1 S3AM-214-PR1 International Travel

4.0 Procedure

- 4.1 Roles and Responsibilities

4.1.1 Employees

- Ensuring that he/she maintains a current work clearance as required for the performance of assigned work duties.
- All employees designated to participate, called Participating Employees, in the medical surveillance program as a condition of employment or participate voluntarily and will be notified in advance if they will be assigned to a location, project or client which requires a Medical Surveillance and Surveillance program.
- If employee knows or suspects that he/she may have an adverse reaction to completing elements of the physical, (such as blood draws, physical limitation, etc.) then the employee should notify the MSP at the time they schedule the physical so that appropriate safeguards may be taken to protect the health of the employee.
- Communicate any change in medical condition (e.g. medications, pregnancy), to MSP to allow for evaluation of the need for additional precautions.

4.1.2 Supervisors and Operations Managers

- Evaluates the duties of each employee and prospective employee reporting to him or her for potential participation in the medical screening and surveillance program.
- Responsible for ensuring that the employee is enrolled in the medical screening and surveillance program if the employee's position requires participation. Consult with a SH&E Manager if assistance is needed in determining if an employee is required to participate in the program.
- Assures employees in positions that require medical surveillance in order to meet their job description may not be on site until they have satisfactorily completed the baseline or pre-employment medical examination.

4.1.3 Safety, Health, & Environment (SH&E) Department

- Serves as the primary point of contact between the employee, employee's supervisor, the MSP and the SH&E Department.
- Provides information regarding medical surveillance documentation, forms, and scheduling of services.
- Maintains a medical surveillance database and other associated documents (medical records are maintained by the MSP).
- Assists employees with scheduling of exams with the MSP.
- Participates in initial SH&E training and subsequent reviews and updates that will provide guidance on exam protocols.

4.1.4 SH&E Manager

- Reviews employee assignments with managers to ensure that all employees who should be participating in the medical surveillance program have been enrolled.
- Provides all assistance necessary to ensure all required information is provided to the Medical

Director.

- Report any change in requirements, protocols or concerns with the MSP to the Occupational Health Manager.

4.1.5 Occupational Health Manager

- Provide the MSP with appropriate references (e.g., a copy of this procedure, regulations).
- Designate other employees to participate in certain parameters of the medical screening and surveillance program after consultation with the Medical Director.

4.1.6 Medical Director

- Requires an exposure-specific examination when he/she has reason.
- Determine the frequency of the exposure-specific medical examinations.
- Consults with the Occupational Health Manager.

4.2 General Requirements

4.2.1 All AECOM employees whose work assignments involve potential exposure to harmful chemical and/or physical agents should participate in the medical surveillance program. Guidance as to harmful potential exposures is presented in *S3AM-128-FM1 Medical Surveillance Evaluation (MSE)*. The form provides the primary guidance for determining whether medical screening is required for an employee and the frequency of periodic exams. The MSE is to be completed by the employee and his/her supervisor at the time of hire for any employee who may work outside an office environment. At each annual performance review, the MSE is to be reviewed for accuracy. Other reviews are required whenever there is a change in job tasks.

4.2.2 In addition, employees may be requested to participate in the medical surveillance program if they perform a task that requires an assessment for fitness for duty (e.g., lifting, climbing, etc.). The Supervisor, Operations Manager and SH&E Manager will identify activities/tasks that will require fit-for-duty assessments.

4.2.3 Medical screening and surveillance will only be performed were required by regulatory requirements or this procedure. Screening and surveillance provided at no cost to employees.

4.2.4 For medical screening and surveillance related to international travel, refer to *S3AM-214-PR1 International Travel*.

4.3 Types of Medical Examinations

The medical surveillance program consists of the following types of examinations:

- Baseline (initial)
 - The baseline medical examination is used to identify physical capabilities and medical limitations that may have an impact on the candidate's ability to perform in the position for which he/she is being considered and to provide a baseline against which periodic or project-specific monitoring can be compared. The baseline medical examination is used to determine the suitability of an existing employee for a new assignment (pre-placement) or a candidate's suitability to be hired (pre-employment) for a particular position.
- Periodic (annual or biennial)
 - The periodic medical examination is used to evaluate an employee's continued fitness for duty and to assess any impact occupational exposures may have on his/her health status. The periodic examination includes an update to the medical and work history, results of any occupational exposure assessments and a detailed medical examination tailored to the job description.
 - The SH&E Manager will assist in determining the frequency of the periodic medical examinations based on regulatory requirements, the position held by the employee, and the level of exposure to physical, chemical, and biological agents.



- Employees performing work activities on HAZWOPER sites will receive exams based on the following schedule:

Annual	Working in an exclusion zone and the regulatory required exposure limit is exceeded for 30 or more days a year.
Biennial	Working in an exclusion zone more than 30 days a year and the regulatory required exposure limit is not exceeded.

- Exposure-specific
 - The exposure-specific examination consists of medical tests to assess the impact of occupational exposures associated with a particular activity or project. The Medical Director or SH&E Manager will require an exposure-specific examination when he/she has reason to believe occupational exposures are impacting or may be impacting the health of an employee.
- Exit/termination
 - Employees currently participating in an examination program will receive exit exams when they leave their work assignment as identified in *S3AM-128-ATT1 Exit Exam Determination*. In the event an employee declines the exit exam, the employee will be requested to sign *S3AM-128-FM2 Waiver of Exit Medical Surveillance Exam*.
 - An exit medical examination is offered when an employee leaves the medical surveillance program, either because of termination of employment with AECOM or because of reassignment to a position not designated to participate in the medical surveillance program or if conditions in the workplace no longer constitutes the need for the medical surveillance (e.g., change in product).
 - The exit examination assesses any impact occupational exposures may have had on the employee's health status.

4.4 Exam Protocols

- 4.4.1 *S3AM-128-ATT2 Exam Protocol* identifies the medical exam components of exam.
- 4.4.2 The evaluation will be confidential and provided during normal business hours. Employees will be offered the opportunity to discuss the results of the evaluation with the MSP. All exam results are considered personal and confidential information, and will not be stored in any unsecured records not transmitted without the employee's permission.

4.5 Participating Employee Guidance and Documentation

- 4.5.1 When necessary, based on the position being filled, the hiring Supervisor and Human Resources Representative informs the candidate that the offer of employment is contingent on the candidate being physically and medically qualified to perform the duties of the position for which he/she is being hired. The hiring Supervisor and Human Resources Representative may not allow the candidate to begin employment until the conditions of the offer letter have been satisfied.
- 4.5.2 When designated to participate in the medical surveillance program, the Employee completes and signs the following documents:
 - Medical and Work History Questionnaire (provided by the MSP).
 - Medical Records Release authorizing MSP to receive the work clearance certificate.
- 4.5.3 Any Employee that has not completed the required medical evaluation after 30 days of an expiration date will be issued a non-qualified statement. The Employee is not permitted to perform the associated task and/or work until the required medical evaluation is completed and a qualified statement is issued by the Medical Director.
- 4.5.4 If an exam becomes due during an employee's pregnancy, it is advised to defer the exam until after delivery and the employee returns to work from family/medical leave status.
- 4.5.5 Human Resources Representative

- Notifies the SH&E Manager or designee to arrange for exit medical examination, upon notification of termination or impending termination from the Supervisor. In the event an employee declines the exit exam, the employee will be requested to sign *S3AM-128-FM2 Waiver of Exit Medical Surveillance Exam*.
- Place the original waiver in the employee's Human Resources personnel file and send a copy to the MSP.

4.5.6 Medical Services Provider (MSP)

- Provides notification approximately 30 days before subsequent periodic or exposure-specific medical examination is due.
- Notify the employee 30 days before the periodic or exposure-specific medical examination is due.
- Provides notification of delinquent medical examinations.

4.5.7 Operations Manager

- Facilitate the management and exchange of documentation regarding the medical screening and surveillance program between AECOM (typically employee's supervisor) and MSP using the *S3AM-128-FM3 Scheduling Request Form*. If exams for multiple employees is required, the information from page 1 of the Scheduling Request Form and the requested exams can be placed in a spreadsheet and sent to the MSP.
- Schedule the initial exam for newly hired or re-assigned employees as needed. Special requests should be coordinated with the SH&E Manager, prior to contacting MSP to schedule.
- Assist employees with scheduling examinations as necessary.
- Coordinate medical surveillance program information exchange between Human Resources Representative and the MSP as necessary.
- Notify the candidate's manager and Human Resources upon receipt of the work clearance.
- Provide information from previous examinations that may not be readily available.

4.5.8 SH&E Manager

- Provides such assistance as is requested by the hiring Supervisor to ensure the job description for the position being filled adequately describes the physical, chemical, and biological stresses of the position, and the PPE used or which may be used, including respiratory protection.
- Provides all necessary assistance to ensure that required and appropriate information is provided with the request and authorization for medical examination.
- Provides assistance to the hiring Supervisor to interpret physical activity restrictions if such restrictions are noted on the work clearance certificate.
- Confirms that all relevant exposure assessments have been appropriately annotated to show the applicability to the employee and forwarded to the MSP.
- Confirms that employees on the delinquent medical examination list have been removed from designated assignments.
- Provides assistance to ensure that terminating and reassigned employees are offered the opportunity to take an exit medical examination.

4.5.9 Supervisor

- Arranges work assignments so that the employee is available to take the medical examination before the work clearance certificate expires.

- Removes the employee from the work assignment before the work clearance certificate expires until the medical evaluation is completed and a qualified statement is issued by the Medical Director.
- Contacts the Human Resources Representative, upon notification of termination or reassignment and requests they arrange for the MSP to perform an exit medical examination.
- Releases the terminating or reassigned employee from duties as necessary to complete the exit medical examination.

4.6 Reports

4.6.1 Report of Examination

- The MSP provides AECOM and the employee with a copy of the work clearance certificate, which will include any medical restrictions and address the employee's ability to use personal protective equipment. AECOM requires the employee to preserve the work clearance certificate in a safe place and provide copies to AECOM managers and clients when requested.
- The MSP will mail a confidential letter detailing the results of the exam to the employee's home address within 30 days of the exam date.

4.6.2 Examinations Due Report

- The MSP produces a list by organization code of employees due to be examined 30 days before the expiration of their work clearance certificate. This list is provided to SH&E Department, who ensures each Supervisor is notified of the employees in his/her charge who are due examinations so they may be scheduled appropriately.
- The MSP notifies each employee via email or phone to the office of record 30 days before the periodic or exposure-specific medical examination is due.

4.6.3 Delinquent Examinations Report

- The MSP distributes a report of delinquent medical examinations to the SH&E Department.
- When an employee's name appears on the delinquent examination report for two consecutive months, the SH&E Department must notify the SH&E Manager, who will bring this to the attention of the employee's Supervisor for resolution. If the delinquency issue is not resolved, the employee's regional management will be notified for final resolution.

4.6.4 Physical Activity Restriction Report

- The Supervisor maintains a list of employees who have physical activity restrictions.
- The SH&E Manager shall evaluate locations and projects periodically to ensure employees with physical activity restrictions are not exceeding their limitations. Concerns of an employee exceeding his/her physical activity restriction is brought to the attention of the employee's Supervisor for resolution.

4.6.5 Annual Reports

- The MSP provides annual reports of utilization, medical trends, and statistical analyses. These reports are prepared to improve the service, manage trends, and reduce the cost of the medical screening and surveillance program.

5.0 Records

- 5.1 Employees who participate in a medical surveillance or physical examination program or had exposure monitoring conducted will have access to all employee exposure and medical records maintained for that employee by AECOM and the MSP.

- 5.2 Upon an employee entering into a medical surveillance or physical examination program, the employee shall be informed of the following:
- The existence, location and availability of any records covered by this procedure
 - The MSP responsible for maintaining and providing access to records and
 - The employee's right of access to these confidential records.
- 5.3 Employees in medical monitoring programs are notified initially and annually thereafter, of the existence, location and ability to access medical records maintained by the MSP. Upon request, each employee (or designated representative) will have access to the employee's medical records. Prior to the release of health information to the employee (or designated representative), a specific written consent must be signed by the employee. Records will be provided in a reasonable time and manner at no cost to the employee.
- 5.4 Medical records must be preserved and protected in accordance with applicable legislative requirements for the duration of employment plus 30 years, verify local, state or federal regulations to confirm time period. Medical records contain information that is protected by the Privacy Act. To meet the obligations of preserving the medical records and protecting the information they contain, AECOM has arranged for the MSP to manage the medical records.
- 5.5 An employee or designated representative may request to review his/her medical. Such a request must be in writing and be signed and dated. The SH&E Manager or the SH&E Department will forward the request to the MSP, who will provide the employee with a copy of the medical records.
- The MSP provides employees with a copy of their results after each physical. If employee would like a copy of their historical records, the MSP will supply the copy within 15 days after the request has been submitted by the employee or designated representative.
- 5.6 MSP performs quality control checks on all medical records to ensure examining physicians appropriately record the findings of the examination and tests.
- The MSP has access to all medical records to perform quality assurance checks to ensure proper recording and preservation
- 5.7 Projects that use local clinics or employer/client clinics may store records at that site, but at the termination of the project, all employee medical records must be transferred to long-term record retention.
- 5.8 If in the event AECOM ceases operations, medical records will be transferred to the successor employer. If no successor employer is available, records will be transferred to the National Institute for Occupational Safety and Health.

6.0 Attachments

- 6.1 [S3AM-128-ATT1](#) [Exit Exam Determination](#)
- 6.2 [S3AM-128-ATT2](#) [Exam Protocols](#)
- 6.3 [S3AM-128-FM1](#) [Medical Surveillance Evaluation](#)
- 6.4 [S3AM-128-FM2](#) [Waiver of Exit Medical Surveillance Exam](#)
- 6.5 [S3AM-128-FM3](#) [Scheduling Request Form](#)
- 6.6 [S3AM-128-FM4](#) [Waiver of Medical Screening & Surveillance Program](#)

Americas

Personal Protective Equipment

S3AM-208-PR1

1.0 Purpose and Scope

- 1.1 Provide an effective Personal Protective Equipment (PPE) Program to protect AECOM employees from potential workplace safety and health hazards.
- 1.2 This procedure applies to all AECOM Americas-based employees and operations and any other entity and its personnel contractually required to comply with this document's content.
- 1.3 The proper use of appropriate PPE, in combination with effective engineering and administrative controls, can provide AECOM employees with protection against potential workplace hazards and can reduce the potential for workplace injury and illness.

2.0 Terms and Definitions

- 2.1 **ANSI** – American National Standards Institute
- 2.2 **CSA** – Canadian Standards Association
- 2.3 **PPE** – Personal Protective Equipment
- 2.4 **SDS** – Safety Data Sheets
- 2.5 **THA** – Task Hazard Assessment

3.0 References

- 3.1 S3AM-123-PR1 Respiratory Protection
- 3.2 S3AM-209-PR1 Risk Assessment & Management
- 3.3 S3AM-301-PR1 Confined Spaces
- 3.4 S3AM-304-PR1 Fall Protection
- 3.5 S3AM-315-PR1 Working On & Near Water
- 3.6 S3AM-317-PR1 Hand Safety

4.0 Procedure

4.1 Roles and Responsibilities

4.1.1 Managers or Supervisors

- Confirm the location specific SH&E Plan documents required hazard controls.
- Confirm Task Hazard Assessments (THAs) are conducted and hazards identified are eliminated through substitution, engineering, or administrative controls first before assigning PPE for hazard mitigation.
- Confirm appropriate subject matter experts, manufacturer's specifications, and regulatory requirements are consulted as necessary to assist with proper PPE selection.
- Match the appropriate PPE to those hazards that cannot be eliminated; support employees in exercising Stop Work Authority if the task is too hazardous to be mitigated
- Provide and document employee training on use and care of PPE.
- Determine which staff requires employee-issued PPE.



- Determine PPE requirements for visitors.
- If applicable, manage medical monitoring of employees using PPE (e.g. respirators, hearing protection, radiation, etc.).
- Approve the purchase of company-issued PPE.
- Confirm that appropriate PPE is utilized by employees when required or necessary. This may periodically be documented using *S3AM-208-FM2 Personal Protective Equipment Inspection*.
- Exercise Stop Work Authority if PPE is inadequate to address hazards.

4.1.2 SH&E Managers

- Provide guidance to Managers, Supervisors, and staff on the assessment of hazards and the selection of PPE.
- Provide training materials to Managers and Supervisors for employee training

4.1.3 Employee

- Review all relevant SH&E Plans, THAs and applicable SDS prior to commencing work.
- Exercise Stop Work Authority if the task is too hazardous.
- In accordance with training and instructions, utilize appropriate PPE that has been issued when required or necessary.
- Inspect PPE prior to and after use to confirm that it is functional, and maintain PPE in a clean and functional condition.
- Follow instructions and manufacturers' guidance on the care, use, and storage of PPE.
- Replace PPE when worn out, expired or damaged.
- Refrain from wearing PPE outside of the work area for which it is required if doing so would constitute a hazard.

4.2 Hazard Assessment

- 4.2.1 The location specific SH&E plan and THA shall assess the hazards and identify the necessary control measures. Refer to *S3AM-209-PR1 Risk Assessment & Management*.
- 4.2.2 These control measures shall include direction and guidance concerning the appropriate PPE required as the last line of defense to the anticipated hazards of the specific operations and tasks. A PPE specific assessment may assist in identifying PPE requirements. *S3AM-208-FM1 Personal Protective Equipment Assessment* may be completed and included in the SH&E Plan.
- 4.2.3 Various tasks and operations, including but not limited to, demolition, remediation, spill response, asbestos abatement, and lead removal, may require additional direction concerning selection, use, care, and disposal of PPE from a subject matter expert (e.g. protector manufacturer, industrial hygienist, asbestos professional, etc.).
- Obtained direction shall be included in the SH&E Plan.
 - Consultation with subject matters may be limited to the planning phase or they may be retained to provide technical assistance for a portion of or duration of the project.

4.3 Training

- 4.3.1 All employees shall be informed of their right to Stop Work if the task is too hazardous to mitigate through use of elimination, substitution, engineering controls, administrative controls, and PPE.
- 4.3.2 Staff will receive adequate instruction on the correct use, limitations, and assigned maintenance duties for the equipment to be used. The following information, at a minimum, will 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 for, maintain, and dispose of the PPE.
- 4.3.3 Retraining may be required as applicable (e.g., observed non-compliance, changes in procedure, etc.).
- 4.3.4 Staff are responsible for confirming that they have reviewed the operation manual/instructions for the PPE before work commences.
- 4.3.5 All staff will receive a location specific orientation to the hazards on the job site as well as appropriate PPE requirements.
- 4.4 Determining the Need for PPE
- 4.4.1 Prior to beginning work, the SH&E plan shall be consulted and THAs developed to identify the PPE requirements.
- 4.4.2 After the hazard assessments have been completed, the manager and/or employee shall select the appropriate PPE for each job category or task, as necessary. PPE will be provided to each employee appropriate for the hazards present.
- All PPE selected, purchased and used by AECOM will meet or exceed the appropriate ANSI/CSA standards or other standards as determined by federal, provincial, territorial, or state legislation.
- 4.4.3 If the hazard can be mitigated through using appropriate PPE shall:
- Properly fit the employee's body. Reasonable attempts shall be made to procure gender-specific gear / sizing.
 - Be selected and used in accordance with recognized standards and provide effective protection.
 - Not in itself create a hazard to the wearer (e.g., scratched safety glasses which could cause impaired vision should be replaced with clear safety glasses).
 - Be compatible so that one item of PPE does not interfere with other PPE.
 - Be maintained in good working order and in a sanitary condition.
 - Not be altered in any way.
- 4.4.4 Prior to entering any controlled or restricted work area, employees shall review the SH&E plan and corresponding THA(s) to confirm that they are equipped with the applicable ANSI/CSA-approved PPE, appropriate to the specific work area's hazards.
- 4.5 Eye and Face Protection
- 4.5.1 AECOM employees shall use appropriate eye and face protection when eye or face hazards are present or potential from flying particles, molten metal, liquid chemicals, acid and caustic liquids, chemical gases or vapors, or injurious light radiation.
- 4.5.2 Safety glasses with side protection is the minimum eye protection requirement. Additional eye protection shall be suitable to the anticipated hazards (e.g. goggles, safety glasses with a face-shield, welder's helmet, etc.). Refer to *S3AM-208-ATT1 Eye & Face Protection*.
- 4.6 Head Protection



- 4.6.1 Appropriate protective hardhats are required when employees are working in areas where there is any potential for injury to the head.
- 4.6.2 Head protection shall be suitable to the anticipated hazards (e.g. working near exposed electrical conductors requires hardhats designed to reduce electrical shock). Refer to *S3AM-208-ATT2 Head Protection*.
- 4.7 Foot Protection
 - 4.7.1 AECOM employees shall use appropriate foot protection when hazards to feet are present or potential; including impact, puncture, cut, electrical, thermal or chemical hazards.
 - 4.7.2 Refer to *S3AM-208-ATT3 Foot Protection*.
- 4.8 Hand Protection
 - 4.8.1 Appropriate hand protection is required when employee's hands are exposed to hazards such as those from skin absorption of harmful substances, cuts and lacerations, abrasions, punctures, chemical burns, thermal burns, electricity, or harmful temperature extremes.
 - 4.8.2 Refer to *S3AM-208-ATT4 Hand Protection* and *S3AM-317-PR1 Hand Safety*.
- 4.9 Chemically Resistant Clothing
 - 4.9.1 Chemically resistant clothing is required when there is significant potential for the employee to come in direct contact with the chemicals being handled. Tasks that involve chemical handling will be evaluated for potential splashing or spilling. Refer to *S3AM-208-ATT5 Limb & Body Protection*.
 - 4.9.2 The process for selecting chemical resistant clothing will be similar for the selection of chemical resistant gloves (refer to *S3AM-208-ATT4-Hand Protection* and *S3AM-317-PR1 Hand Safety*).
- 4.10 High-Visibility Apparel
 - 4.10.1 "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 or III requirements of ANSI/CSA standards. Refer to *S3AM-208-ATT6 High Visibility Safety Apparel*.
 - 4.10.2 Color of apparel (orange or lime) may be client/project-specific. If there is a specific need to be visible to the passing public, to machine operators, or to other crew members, high visibility vests shall be worn (and retro-reflective striping on arms and legs at night).
 - 4.10.3 Work conducted at night may require that the minimum level of apparel worn be, at minimum, ANSI/CSA Class III, and in accordance with the governing legislation.
- 4.11 Personal Clothing
 - 4.11.1 Employees on a project site shall wear full length trousers and shirts that cover shoulders.
 - 4.11.2 For personal safety on the job site, do not wear
 - Loose or unsecured clothing or loose fitting cuffs;
 - Greasy or oily clothing, gloves, or boots; or
 - Torn or ragged clothing.
 - Jewelry (e.g. rings, bracelets, neck chains) when working with moving parts or there is a risk or entanglement.
 - 4.11.3 Long hair shall be tied back or otherwise confined when working with moving parts or there is a risk of entanglement.
 - 4.11.4 Clothing made of synthetic fibers can be readily ignited and melted by electric flash or extreme heat sources. Cotton or wool fabrics are recommended for general use.



- 4.11.5 Footwear shall be suitable for the site conditions and task requirements. No athletic shoes, sandals, flip flops, permitted on active job sites.
- 4.11.6 It is recommended to use clothing with sun protection properties when working in high sun UV exposure
- 4.12 Specialized PPE
 - 4.12.1 In addition to basic PPE, additional specialized PPE may be required to provide appropriate protection to the employee. Refer to applicable legislation and related SH&E procedures for additional information on PPE requirements.
 - Fall Protection – Only full-body harnesses with shock-absorbing lanyards will be used for personal fall arrest. Refer to *S3AM-304-PR1 Fall Protection*.
 - Respiratory Protection – Respiratory protection shall be selected based on the contaminant and concentration to which the employee will be exposed. Refer to *S3AM-123-PR1 Respiratory Protection*, the task- or project-specific hazard assessments and the applicable SDSs for specific requirements.
 - Fire Resistant Clothing (FRC) – Approved fire-resistant outer clothing may be required at work locations with flammable or explosive materials or environments. Refer to *S3AM-208-ATT5 Limb & Body Protection*.
 - Other Head Protection – Operators and passengers (if trained and permitted) of all-terrain vehicles and snowmobiles will wear approved helmets. Refer to *S3AM-208-ATT2 Head Protection*.
 - Protection from Drowning – Appropriate personal floatation devices shall be worn when work working over and near water. Refer to *S3AM-315 Working On & Near Water*.
 - Temperature Extremes – Work in cold environments may require additional layers and insulated clothing, gloves, boots and accessories such as balaclavas, hardhat liners. Confirm these items are approved and do not introduce additional unacceptable hazards (e.g. insufficient visibility, conductivity, etc.).
 - Hearing Protection – Noise levels in the work environment that cannot be eliminated or reduced to acceptable levels requires worker be protected from exposure. Refer to *S3AM-118-PR1 Hearing Conservation*.
 - Traction Devices – Traction devices applied to the base of work boots may be necessary if the employee may be walking on icy surfaces. Refer to *S3AM-208-ATT3 Foot Protection*.
 - Rescue – Confined spaces hazards may necessitate the use of specific harnesses attached to retrieval lines to facilitate rescue. Refer to *S3AM-301-PR1 Confined Spaces*.
- 4.13 Maintaining PPE Supplies
 - 4.13.1 Employees shall inspect their required PPE prior to use. Defective equipment shall be removed from service and replaced.
 - 4.13.2 Each AECOM location will maintain a supply of safety equipment of appropriate types and sizes, including hard hats, high visibility vests, safety glasses, gloves, hearing protection and chemically resistant clothing based on the nature of their field activities. The Manager or designee will be responsible for maintaining this inventory.
 - 4.13.3 Use of PPE by employees and adequacy of protection should be evaluated on a routine basis. This may periodically be documented using *S3AM-208-FM2 Personal Protective Equipment Inspection*.
 - 4.13.4 At a minimum, locations will review their PPE program annually.
- 4.14 Obtaining Personalized Safety Gear
 - 4.14.1 Employees are not expected to provide their own general PPE. Most basic PPE will be provided to the employee at no charge (e.g. safety glasses, hard hat, gloves, hearing protection, etc.) with the



exception of the below personalized safety equipment (prescription safety glasses, safety-toed boots, any washable coveralls).

- 4.14.2 Certain personalized safety gear such as prescription safety glasses, safety-toed (capped) boots, and any washable coveralls will be ordered and sized specifically by the user. A partial cost reimbursement to the employee may be made if their location provides a specialized PPE purchase program.
- 4.14.3 All specialized PPE (e.g. fall protection equipment, respirators, helmets, etc.) will be provided by AECOM for employee use at no charge to the employee, with the exception of the above personalized safety equipment (prescription safety glasses, safety-toed boots, any washable coveralls).

5.0 Records

- 5.1 Completed SH&E plans, THAs documenting PPE requirements, and as applicable, PPE assessments and PPE inspections, will be maintained in the location's safety files.

6.0 Attachments

- 6.1 [S3AM-208-ATT1 Eye & Face Protection](#)
- 6.2 [S3AM-208-ATT2 Head Protection](#)
- 6.3 [S3AM-208-ATT3 Foot Protection](#)
- 6.4 [S3AM-208-ATT4 Hand Protection](#)
- 6.5 [S3AM-208-ATT5 Limb & Body Protection](#)
- 6.6 [S3AM-208-ATT6 High Visibility Safety Apparel](#)
- 6.7 [S3AM-208-FM1 Personal Protective Equipment Assessment](#)
- 6.8 [S3AM-208-FM2 Personal Protective Equipment Inspection](#)

Americas

International Travel

S3AM-214-PR1

1.0 Purpose and Scope

- 1.1 The purpose of this procedure is to reduce employee risk from occupational hazards, communicable diseases, and non-communicable diseases that may be encountered in the work environment when traveling to low income or more hazardous locations in the world.

Table 2 uses a United Nations World Bank designation for countries as Low, Middle, or High Income Countries. The premise for using this list is that travel to High Income Countries requires limited pre-travel and post-travel medical screening, because public health concerns are well managed, and medical services are readily available. On the other end of the spectrum, travel to Low Income Countries requires aggressive pre-travel medical screening and may require post-travel screening for communicable diseases like tuberculosis. The AECOM Global Resilience Group should also be consulted if there is a potential for employee security to be at-risk.

This procedure does not address approvals for travel outside of the employee's country of employment. Those requirements are delineated in other Company policies and procedures (e.g., Travel, Business Group); the Manager and traveling employee are cautioned to assure approvals for travel are completed properly.

The Manager of the traveling employee is responsible for the safety and well-being of the traveler, and must assure adequate precautions and resources are allocated to comply with this procedure. The traveling employee is responsible for taking all precautionary measures for medical clearances; obtaining immunizations as directed; and otherwise managing their risks using sound judgment.

Each traveling employee is strongly encouraged to carefully consult with Human Resources regarding changes in status to medical benefits, life insurance coverage, and related benefits associated within the geography of the travel destination.

- 1.2 This procedure applies to all AECOM Americas-based employees and any other entity and its personnel contractually required to comply with this document's content when personnel are required to travel to remote or potentially dangerous locations.

2.0 Terms and Definitions

- 2.1 None

3.0 References

- 3.1 Centers for Disease Control and Prevention (CDC) "[Health Information for International Travel](#)"
- 3.2 CDC Traveler's Health Hotline (877) 394-8747
- 3.3 United States Department of State Office of American Citizens Services and Crisis Management (202) 647-5225
- 3.4 [CDC Travel Information](#)
- 3.5 [World Health Organization](#)
- 3.6 Lonely Planet [Traveler's Guides](#)
- 3.7 [International SOS](#)
- 3.8 S3AM-004-PR1 Incident Reporting, Notifications & Investigation
- 3.9 S3AM-018-PR1 Injury & Claims Management
- 3.10 S3AM-110-PR1 Toxic & Hazardous Substances



3.11 S3AM-128-PR1 Medical Screening & Surveillance

4.0 Procedure

4.1 Implementation of this procedure is the responsibility of the manager directing activities of the facility, site, or project location.

4.2 Before Travel Begins

4.2.1 Review information from AECOM Global Resilience Group and current State Department Travel Warnings. Understand the conditions on the ground relating to crime, security, public health, and travel constraints.

4.2.2 When arranging transportation, consider:

- Travel to, from, and within the host country. Identify primary and alternative transportation means within the destination country.
- Long-term lease or purchase of vehicles is highly discouraged.
- Traveler may require an International Driver's License if driving is necessary.
- Automobile insurance will be required; because the Company's normal auto insurance will not be in force in many destinations.
- Federal Acquisition Regulation (FAR) 52.247-63 (U.S. Air Carrier Preference).
- Hospitals and clinics near the work area for treatment of injury or illness. This includes researching insurance and forms of payment, ability to treat westerners (language, cultural norms), and whether appropriate levels of security are incorporated into hospital procedures.

4.2.3 Required identification includes a valid and current Passport. Contract requirements **may** include the issuance of:

- Common Access Card (CAC) issued by the Department of Defense (DOD)
- DD Form 489 (Geneva Conventions Identity Card for Persons who Accompany the Armed Forces)
- Personal identification tags (e.g., dog tags)
- United Nations specific identification
- Other in-theater identification
- Dental panograph
- DNA sample.

4.2.4 Understand local conditions and culture.

- Local laws and customs (including local firearms and alcohol laws)
- Weather, terrain, language, currency, and religious issues
- Paying of entry and exit duties on personal items in possession of the employee
- Banking access (e.g., ATM cards, credit cards, etc.).

4.2.5 A SH&E Plan is required for each operation where an AECOM employee will be working:

- High-Risk Travel Locations as determined by AECOM's Global Resilience Group.
- In a Low-Income Country (see Table 2).



4.2.6 The SH&E Manager supporting the operation must approve the SH&E Plan. The SH&E Plan must address:

- Roles and Responsibilities
- Emergency/Contingency Plans and contact information addressing injury, evacuation, death, and other contingencies appropriate for the operation and geography. This should include equipment or other resources for:
 - Medical first aid treatment (including requirements for first aid kits and trained personnel)
 - Occupational clinics and hospital emergency rooms
 - Medical evacuation procedures
 - Fire procedures and extinguisher requirements
 - Evacuation or movement for security reasons or other hostile actions related to civil unrest or acts of war (e.g., vehicle and fuel requirements, evacuation routes, air travel contingencies, etc.)
- Chartis Travel Guard is the key AECOM provider related to medical support and evacuation while traveling outside of the US or EU for defense base act claims. International SOS (www.internationalsos.com) is also a resource for employees that are traveling for personal reasons or have personal medical illnesses requiring medical support and/or evacuations.
- Pre-travel medical screening criteria (see Table 1 and *S3AM-214-ATT1 – International Pre-Deployment & Post-Deployment Physical Plan*, if applicable)
 - Based on the requirements of the contract, the DoDI mandates that for civilian contractors, some programs may have more stringent medical criteria for assurance of fitness for duty in areas with limited medical resources.

DoDI defines Contingency Contractor Personnel as defense contractors and employees of defense contractors and associated subcontractors, including U.S. citizens, U.S. legal aliens, TCNs, and citizens of HN who are authorized to accompany U.S. military forces in contingency operations or other military operations, pre-exercises designated by the geographic Combat Commander. This includes employees of external support, systems support, and theater support contractors. Such personnel are provided with an appropriate identification card under the Geneva Conventions.

Contractors Deploying with the Force (CDF) are a sub-category of Contingency Contractor Personnel. DoDI defines CDF as employees of system support and external support contractors, and associated subcontractors, at all tiers, who are specifically authorized in their contract to deploy through a deployment center or process and provide support to U.S. military forces in contingency operations or in other military operations, or exercises designated by a geographic Combatant Commander. CDF includes forward-deployed system support and external support contractors designated to remain in place in theater when a contingency is declared. Such personnel are provided with an appropriate identification card under the Geneva Conventions. CDF usually work for the U.S. military forces under a deployable contract agreement in peacetime and in many cases have a long-term relationship with a specific unit. They usually live with and provide services directly to U.S. military forces and receive Government-furnished support similar to DoD civilians. CDF do not include TCN or local national personnel hired in theater using local procurement (e.g., day laborers). Personnel that are considered CDF shall be evaluated through the pre-deployment screening using the standards set by the DOD as stated in *S3AM-214-ATT1 – International Pre-Deployment & Post-Deployment Physical Plan*.

- Post-travel medical screening criteria (see Table 1)
- Pre-travel and recurring training requirements
- Description of work to be performed



- The safety and security hazards present in the work activity and in the area.
 - The mitigations to the above-indicated hazards (engineering, administrative, and personal protective equipment). This must include a description of medical surveillance required for work at the deployment site, including hearing conservation (e.g., aviation-related work) and chemical exposure surveillance (e.g., as required in *S3AM-110-PR1 – Toxic & Hazardous Substances*).
- 4.2.7 The responsible Manager must establish contact with the AECOM Corporate SH&E Occupational Health Manager (OHM) to determine medical screening and surveillance requirements; establish an immunizations list for the geography being visited; and coordinate information needs for the notification of the appropriate workers' compensation insurance provider. **The information required to start the process (i.e., who, when, where, what) is to be provided to the OHM at least 3 weeks before travel is scheduled to allow time to arrange physical examinations and medical services.**
- 4.2.8 Medical examinations to screen employees for physical suitability for the travel and work will be performed in coordination with the OHM in accordance with Tables 1 and 2. Medical Screening requires that an initial questionnaire be completed by the traveling employee. Use the medical information form in *S3AM-128-FM1 - Medical Screening Evaluation*, or an equivalent form as approved by the OHM.
- 4.2.9 The Manager will retain a copy of the traveling employee's passport picture page and identification information for use as needed while the employee is traveling.
- 4.2.10 The Manager must confirm regular status updates with the traveling employee. This should include a rough itinerary with hotel location, airlines used for travel, and schedule of dates for anticipated movement.
- 4.2.11 The Manager must make contingencies for communications with the traveling employee(s) so that the location and status of the traveling employee is updated and confirmed every 48 hours while traveling. This communication may be completed telephonically, by e-mail, or by other real-time means of communicating.
- 4.2.12 When possible, employees will not travel alone.
- 4.2.13 Certain items may require approvals under the International Traffic in Arms Regulations (ITAR) procedures before travel begins. ITAR applies to computers (for sensitive technology concerns) and body armor. Other technology that may be considered ITAR-sensitive includes satellite phones, air monitoring instrumentation, and radio frequency identification (RFID) technology. Review the technology and materials you will need, and check with the Vice President for Contracts Management for ITAR approvals.



Table 1: Pre-Travel Medical Screening and Records Criteria

	High-Income Countries (see Table 2)	Middle-Income Countries (see Table 2)	Low-Income Countries (see Table 2)
Business travel for more than 90 days	As below	As below	As below
Business travel for less than 90 days and more than 31 days	As below	<p>Immunizations: Hep A, Hep B, tetanus, typhoid, polio, MMR, seasonal flu and H1N1, malaria prophylaxis (if recommended for geographical area by CDC).</p> <p>Physical: General Physical – CBC with differential, metabolic profile, chest x-ray, urinalysis, pulmonary function test, audiogram, vision test, ECG if more than 40 years of age, HIV, Blood type, DNA (if not available, panoramic dental films must be obtained), Typhoid antibody test (if typhoid vaccine was given in the past year), G6PD, TB mantoux skin test (with reading of results in 48-72 hours), drug screen.</p> <p>Men: PSA>40 years of age Women: Pap smear and mammogram (if over 45) within the last 6 months and pregnancy test.</p>	<p>Immunizations: Hep A, Hep B, tetanus, typhoid, polio, MMR, seasonal flu and H1N1, yellow fever, meningococcal, malaria prophylaxis (if recommended for geographical area by CDC) and as recommended by the U.S. Center for Disease Control* immunization for the region of travel.</p> <p>Physical: Complete Physical – CBC with differential, metabolic profile, chest x-ray, urinalysis, pulmonary function test, audiogram, vision test, ECG if more than 40 years of age, HIV, Blood type, DNA (if not available, panoramic dental films must be obtained), Typhoid antibody test (if typhoid vaccine was given in the past year), G6PD, TB mantoux skin test (with reading of results in 48-72 hours), drug screen.</p> <p>Men: PSA>40 years of age Women: Pap smear and mammogram (if over 45) within the last 6 months and pregnancy test.</p> <p>Dental: Complete exam with release stating "no required dental anticipated care in the next 6 months."</p>
Business travel for up to or more than 10 days, and less than 30 days continuous travel (or more than 10 days in any 90-day period of non-sequential travel)	As below	As below	As below
Business travel for less than 10 days continuous travel	Recommend following U.S. Center for Disease Control* immunization recommendations for region of travel.	Recommend following U.S. Center for Disease Control* immunization recommendations for region of travel.	Immunizations: Required to follow U.S. Center for Disease Control* immunization recommendations for region of travel.

*Or equivalent organization for home country.



Table 2: List of Countries and Designated Status
 (Income designations from the UN World Bank, 2016)

High-Income Countries	Middle-Income Countries	Low-Income Countries
Andorra	Albania	Afghanistan
Antigua and Barbuda	Algeria	Benin
Argentina	American Samoa	Burkina Faso
Aruba	Angola	Burundi
Australia	Armenia	Cambodia
Austria	Azerbaijan	Central African Republic
Bahamas, The	Bangladesh	Chad
Bahrain	Belarus	Comoros
Barbados	Belize	Congo, Dem. Rep.
Belgium	Bhutan	Eritrea
Bermuda	Bolivia	Ethiopia
Brunei Darussalam	Bosnia and Herzegovina	Gambia, The
Canada	Botswana	Guinea
Cayman Islands	Brazil	Guinea-Bissau
Channel Islands	Bulgaria	Haiti
Chile	Cameroon	Korea, Dem. Rep.
Croatia	Cape Verde	Liberia
Curacao	China	Madagascar
Cyprus	Colombia	Malawi
Czech Republic	Congo, Rep.	Mali
Denmark	Costa Rica	Mozambique
Estonia	Côte d'Ivoire	Nepal
Faeroe Islands	Cuba	Niger
Finland	Djibouti	Rwanda
France	Dominica	Sierra Leone
French Polynesia	Dominican Republic	Somalia
Germany	Ecuador	Sudan
Greece	Egypt, Arab Rep.	Tanzania
Greenland	El Salvador	Togo
Guam	Equatorial Guinea	Uganda
Hong Kong, China	Fiji	Zimbabwe
Hungary	Gabon	
Iceland	Georgia	
Ireland	Ghana	
Isle of Man	Grenada	
Israel	Guatemala	
Italy	Guyana	
Japan	Honduras	
Korea, Rep.	India	
Kuwait	Indonesia	
Latvia	Iran, Islamic Rep.	
Liechtenstein	Iraq	
Lithuania	Jamaica	
Luxembourg	Jordan	
Macao, China	Kenya	
Malta	Kazakhstan	
Monaco	Kiribati	
Netherlands	Latvia	
New Caledonia	Lebanon	
New Zealand	Kyrgyz Republic	
Northern Mariana Island	Lao PDR	
Norway	Lesotho	
Oman	Libya	
Poland	Macedonia, FYR	
Portugal	Malaysia	
Puerto Rico	Maldives	



High-Income Countries	Middle-Income Countries	Low-Income Countries
Qatar Russian Federation San Marino Saudi Arabia Seychelles Singapore Slovenia Sint Maarten Slovak Rep. Slovenia Spain St. Kitts and Nevis St. Martin Sweden Switzerland Taiwan, China Trinidad and Tobago Turks & Caicos United Arab Emirates United Kingdom United States Venezuela, RB Virgin Islands (U.S.)	Mauritania Marshall Islands Mauritius Mayotte Mexico Micronesia, Fed. Sts. Moldova Mongolia Montenegro Morocco Myanmar Namibia Nicaragua Nigeria Palau Pakistan Papua New Guinea Panama Paraguay Peru Philippines Romania Samoa São Tomé and Príncipe Senegal Serbia Solomon Islands South Africa Sri Lanka St. Lucia St. Vincent and the Grenadines Suriname Swaziland Syrian Arab Republic Thailand Tajikistan Timor-Leste Tonga Tunisia Turkey Turkmenistan Ukraine Uruguay Vanuatu Uzbekistan Vietnam West Bank and Gaza Yemen, Rep. Zambia	

4.3 During Travel

Accidents are the leading cause of death for travelers; therefore, constant attention to safe behavior is in order. Following the recommendations below will decrease chances of having an accident while traveling.

4.3.1 Preventing Traffic Accidents:

- Hire a qualified driver or guide.
- Drive only when you are in good physical condition (not tired, hung over, intoxicated, etc.) and are familiar with the driving rules and customs of the area.
- Try not to drive at night.
- Rental or purchase of a vehicle is strongly discouraged. If you must rent or purchase, acquire an appropriate vehicle in good mechanical condition that does not stand out from the local norm.
- Wear your seat belt.
- Be sure you purchase and are covered by collision and liability insurance for the area you are traveling.
- If security is a concern, adopt security measures into your driving habits.

4.3.2 Personal Safety While Traveling

- Maintain the agreed-upon communications schedule with your Manager. Advise immediately of any change in scheduled travel or itinerary.
- Dress conservatively, avoiding the appearance of affluence or any association with a military organization.
- To the extent possible, avoid small, nonscheduled airlines in developing countries.
- Do not travel at night.
- Carefully select swimming areas and do not swim alone. In many developing countries, serious diseases are contracted by swimming in streams, so swim only in chlorinated swimming pools.
- Lock your hotel room at all times.
- Review hotel fire safety rules and locate the nearest exits.
- Keep valuables and travel documents in the hotel safe or other secure location.
- Avoid politically unstable regions where there is civil unrest, violence, or high crime rates.
- Keep a photocopy of your passport in a separate location from your original, and leave a copy with your Manager and at home.
- If you wear prescription glasses/contacts, take an extra pair.
- Use a money belt or a concealed money pouch for passports, cash, and other valuables.
- Use official taxis rather than street taxis, because illegal taxis can be decoys for robbers.
- Whenever possible, do not travel alone.
- Keep medicines in their original labeled containers to avoid problems when passing through customs.

4.3.3 Emergencies

- In the event of an injury requiring hospital treatment or security concern, the traveling employee will notify the Manager as soon as possible.
- The Manager will notify the OHM of any injury, illness, or death; and will make other notifications in the Operational and SH&E management chain as necessary.



- The Manager will be responsible for incident notifications and reporting per S3AM-004-PR1 - *Incident Reporting, Notifications & Investigation*.
- Appropriate senior management will start the Crisis Action Team or other support functions as necessary and appropriate to support the affected operations and employees.
- Evacuation support through Chartis Travel Guard or SOS International for medical or security reasons will be initiated through the manager who will contact the AECOM Occupational Health Team for activation. Employees on medical leave must comply with applicable return to work procedures. Activation of evacuation support through International SOS for medical or security reasons may be initiated through the Manager. International SOS is available through their website (www.internationalsos.com), and at 1-800-523-6586 within the continental US. For International SOS contact information outside the US, please refer to the listed website. When accessing SOS, use the appropriate member number: #11BCPA000056.

4.4 After Travel is Completed

- 4.4.1 At the end of the contract or temporary duty (TDY) and upon return to the employee's point of origin, the immediate need is to assure the traveler's health. Medical clearance may be required per Table 3. The Manager will ensure that the returning employee completes the post-travel questionnaire (see S3AM-128-PR1 - *Medical Screening & Surveillance*) and coordinates medical screening through the OHM in a timely manner; optimally, less than 7 days after return to the home country.
- 4.4.2 If there are lessons learned concerning the project or program SH&E function, the Manager will provide a summary of the lessons learned to the SH&E Manager supporting the operation.

Table 3: Post-Travel Medical Screening

	High-Income Countries (See Table 2)	Middle-Income Countries (See Table 2)	Low-Income Countries (See Table 2)
Business travel for less than 10 days	No Action	No Action	Medical questionnaire reviewed by medical professional.
Business travel for more than 11 days, up to 90 days	No Action	Medical questionnaire reviewed by medical professional.	Medical questionnaire reviewed by medical professional, TB mantoux skin test with reading of results in 48-72 hours. If skin test is positive, follow with chest x-ray.
Business travel for more than 91 days	Medical questionnaire reviewed by medical professional	Medical questionnaire reviewed by medical professional, TB mantoux skin test with reading of results in 48-72 hours. If skin test is positive, follow with chest x-ray.	Medical questionnaire reviewed by medical professional, TB mantoux skin test with reading of results in 48-72 hours. If skin test is positive, follow with chest x-ray.

5.0 Records

- 5.1 S3AM-128-FM1 - *Medical Screening Evaluation* must be included in the employee's medical records.

6.0 Attachments

- 6.1 [S3AM-214-ATT1 International Pre-Deployment & Post-Deployment Physical Plan](#)

Americas

Pressure Washer

S3AM-305-ATT9

1.0 Objective / Overview

- 1.1 Pressure washing can be divided into three categories based on the water pressure the equipment is capable of producing:
 - Ultra high pressure jetting – greater than 30,000 psi
 - High pressure washing – 5,000 to 30,000 psi
 - Pressure washing – less than 5,000 psi
- 1.2 Generally, light duty portable pressure washing equipment and car washes produce less than 5,000 psi. High pressure washing equipment is often used for such tasks as cleaning vessels and process piping. Ultra high pressure jetting is also often employed to clean vessels and to remove coatings and scaling of production equipment. If not used correctly and safely, pressure washers can be dangerous piece of work equipment.
- 1.3 AECOM only allows trained, authorized personnel to operate the high pressure washers. Along with training, other safety measures include: reviewing the manufacturers instructional booklet, proper maintenance of equipment, and personal protective equipment.

2.0 Hazards

- 2.1 Kickback – Sudden and violent reverse movement of the gun
- 2.2 Flying debris
- 2.3 Slips and trips on wet surfaces and hoses
- 2.4 Noise
- 2.5 Manual handling
- 2.6 Exhaust fumes/carbon monoxide (CO) in enclosed spaces
- 2.7 Contact with high pressure / high temperature fluids

3.0 Safe Operating Guidelines

- 3.1 Review manufacturer's operating manual, *S3AM-305-PR1 Hand & Power Tools*, *S3AM-305-ATT17 Electric & Battery Hand Tools* or *S3AM-305-ATT16 Small Engines* for additional guidelines.
- 3.2 Ensure area is properly flagged with tags identifying work being performed and hazards. Keep all unauthorized workers out of area while job in progress.
- 3.3 Inspect all hoses, fittings, wands, cords and hose reel for damage or defects.
 - 3.3.1 Equipment is complete and assembled correctly (i.e. nozzle tip correctly connected to the wand and not directly to hose).
 - 3.3.2 Ensure trigger mechanism is functioning properly.
 - 3.3.3 Fittings are securely attached.
 - 3.3.4 Insulated components are in place.
- 3.4 Check fuel connections and hoses for signs of leaks, defects or damage.
- 3.5 Confirm nozzle / jets are clear by turning on water, without pump pressure.



- 3.6 Check pressure pump oil level before use. Hold the wand firmly with the trigger released when turning the pump on.
- 3.7 Recheck hoses once the system is pressurized.
- 3.8 Never service equipment while energized or pressurized.
- 3.9 Ensure other personnel are clear of area while pressure washer is pressurized. Non-operators must remain a minimum of 25 feet (7.6m) from the operator.
- 3.10 Do not wash at a 90 degree angle to minimize spray and flying debris.
- 3.11 Never point a pressure washer at yourself or others. Contact with high pressure fluid can result in serious cut or injection injuries.
- 3.12 Increase pressure slowly during operation to prevent hose kick-back.
- 3.13 Do not drive over, pull on, or kink the high pressure hose. Damage to the hose may compromise the wire braiding inside and cause the hose to burst.
- 3.14 Whip checks must be used for all high pressure connections.
- 3.15 High-pressure washing equipment should be cleaned often to avoid dirt buildup, especially around the trigger and guard area.
- 3.16 Always set the trigger safety lock when the gun valve is not in use.
- 3.17 Relieve the pressure in the system before coupling and uncoupling hoses.
- 3.18 Visually inspect the full length of high pressure discharge hose and inspect other high pressure fluid-handling components for abrasions or cuts, damage caused by exposure to chemicals and for damage caused by kinks in the hose.
- 3.19 High pressure washers shall be used to clean or decontaminate equipment, surfaces or structures only.
- 3.20 High pressure washers WILL NOT be used to clean or decontaminate workers or personal protective equipment while it is being worn.
- 3.21 Maintain a distance from the spray contact point to reduce noise exposure and risk of being struck by flying debris. Avoid overreaching and maintain a stable stance.
- 3.22 When shutting down a pressure washer, turn the pump off before turning the water supply off.
- 3.23 After turning off pressure washer, ensure all residual pressure is released from system by squeezing the trigger. Consult the operator's manual for any other procedures specific to the equipment for shut-down.
- 3.24 Protect unit from freezing, when applicable.

4.0 Personal Protective Equipment

- 4.1 Hardhat.
- 4.2 Safety glasses with side shields and a face shield.
- 4.3 Gloves providing appropriate protection (rubber, chemical).
- 4.4 Hearing protection.
- 4.5 PVC (or equivalent) rain suit.
- 4.6 Safety toed boots with metatarsal protection.

Americas

Hand & Power Tools

S3AM-305-PR1

1.0 Purpose and Scope

- 1.1 This procedure provides the AECOM requirements for all manually operated hand and power tools and associated use, handling and storage. These requirements apply to tools provided by AECOM for employee use as well as tools provided by employees for use on AECOM work sites.
- 1.2 This procedure applies to all AECOM Americas-based employees and operations and any other entity and its personnel contractually required to comply with this document's content.

2.0 Terms and Definitions

- 2.1 None

3.0 References

- 3.1 S3AM-003-PR1 SH&E Training
- 3.2 S3AM-118-PR1 Hearing Conservation
- 3.3 S3AM-208-PR1 Personal Protective Equipment
- 3.4 S3AM-302-PR1 Electrical Safety
- 3.5 S3AM-325-PR1 Lockout Tagout

4.0 Procedure

- 4.1 Roles and Responsibilities
 - 4.1.1 **Managers/Supervisors**
 - Ensure that all aspects of this procedure are followed and adhered to on all AECOM projects, sites and locations.
 - If a specific tool is not included in the work instructions related to this procedure, appropriate guidelines shall be established prior to work associated with that tool, including following manufacturer's recommendations.
 - Ensure compliance with applicable client requirements and restrictions regarding hand or power tools.
 - 4.1.2 **Safety, Health and Environment (SH&E) Manager**
 - Provide technical guidance and support as to this procedure and associated work instructions.
 - 4.1.3 **Employees**
 - Work only with tools for which they are appropriately trained and familiar with.
 - Follow manufacturer's recommendations for its use and never modify the equipment without first obtaining authorization from the manufacturer.
 - Comply with applicable client requirements and restrictions regarding hand or power tools.
- 4.2 Requirements
 - 4.2.1 Always conduct a task hazard assessment (THA) prior to work commencing and include the identified hazards associated with the anticipated tool use.

- 4.2.2 No employee shall use any hand or power tool, unless they are familiar with the use and operation of the equipment or have received specific instruction on its use and operation.
- 4.2.3 All tools will be used for which they were designed and in accordance with manufacturer's specifications. Do not use tools for jobs they are not intended for. For example, do not use a slot screw driver as a chisel, pry bar, wedge or punch or wrenches as hammers.
- 4.2.4 Use approved tools only. Never modify or use makeshift tools.
- 4.2.5 Do not apply excessive force or pressure on tools unless permitted by the manufacturer's specifications. This includes additional force by hammering with body weight, foot or other tools.
- 4.2.6 Keep surfaces and handles clean and free of excess oil and grease to prevent slipping.
- 4.2.7 Do not carry sharp tools (e.g. knife, chisel, screwdriver, etc.) in pockets; this practice may cause puncture wounds.
- 4.2.8 All tools shall be properly maintained. Clean, dry, lubricate and repair tools as applicable, and return to a suitable toolbox, room, rack, or other storage area upon completion of a job.
- 4.2.9 Ensure proper ergonomics principles are observed when using hand and power tools, such as but not limited to:
 - Avoid static and awkward positions when possible.
 - Move at intervals to reduce muscle fatigue.
 - Consider tools with a trigger strip, rather than a trigger button. This strip will allow the exertion of more force over a greater area of the hand that, in turn, will reduce muscle fatigue
 - Do not apply excessive force or pressure on tools.
 - If possible use tools with comfortable grips that are designed to allow the wrist to stay straight. Avoid using a bent wrist.
 - Choose hand tools that have a centre of gravity within or close to the handle.
 - Frequently used tools that weigh more than 1 pound (0.45 kilograms) should be counter-balanced.
 - Ensure proper body positioning when using a tool to prevent slips or falls in the event of unanticipated tool behaviour (slip, kickback, etc.). Avoid over-reaching.
 - Pull on tools such as a wrench or pliers whenever possible. Loss of balance is more likely when pushing if the tool slips. If pushing is necessary, hold the tool with an open palm.
 - Hand-arm vibration exposure is associated with the use of hand tools.
 - Reduce power to the lowest setting that can complete the job safely. This action reduces tool vibration at the source.
 - Consider the need for controls such as limiting time of use.
 - If safe to do so, adjust to a looser but stable grip, and use anti-vibration gloves.
 - Use of heavy tools such as jackhammers can cause fatigue and strains. Heavy rubber grips can reduce these effects by providing a secure handhold.
 - Do not increase a tool's leverage by adding sleeved additions (e.g. a pipe or snipe) to increase tool handle length.
- 4.2.10 Avoid placing fingers and hands in danger zones:
 - Ensure hands and fingers have sufficient clearance in the event the tool slips.
 - Ensure stability of the work-piece. Use work-piece holders (e.g. vise, chisel holder, etc.) whenever possible to prevent injury to hands or deflection of tool or work-piece.

- Use push sticks or guides when cutting or machining smaller material.
- 4.2.11 Secure tools when working from heights to prevent them from falling. Never leave tools on ladders, scaffolds, or overhead work areas when they are not in use.
- 4.2.12 Utilize good housekeeping practices to ensure tools do not present a tripping hazard.
- 4.2.13 Ensure no part of a tool extends over the edge of the bench top. Place sharp tools (e.g., saws, chisels, knives) on benches so that sharp points or edges face away from the edge.
- 4.2.14 When using saw blades, knives, or other tools, if possible direct the tools away from aisle areas and away from other employees working in close proximity.
- 4.2.15 Do not throw tools from place to place or from person to person, or drop tools from heights. Hand them, handle first, directly to other workers.
- 4.2.16 Use non-sparking and intrinsically safe tools in atmospheres with flammable or explosive characteristics and where highly volatile liquids, and other explosive substances are stored or used.
- Iron or steel hand tools may produce sparks that can be an ignition source around flammable substances. Where this hazard exists, spark-resistant tools made of non-ferrous materials shall be used.
 - Electrical tools shall be identified as intrinsically safe.
- 4.2.17 If the task presents electrical hazards, worker must be competent and use the appropriate insulated tools to perform work that includes the risk of electrical shock. Cushioned grip handles do not protect against electrical shock.
- 4.2.18 The fluid used in hydraulic power tools must be an approved fire-resistant fluid and must retain its operating characteristics at the most extreme temperatures to which it will be exposed. The exception to fire-resistant fluid involves all hydraulic fluids used for the insulated sections of derrick trucks, aerial lifts, and hydraulic tools that are used on or around energized lines. This hydraulic fluid shall be of the insulating type.
- 4.2.19 All tools designed to accommodate guards must have the guard(s) in place when the tool is in use. Do not modify, remove, or disable any machine guards.
- 4.2.20 Do not allow loose clothing, long hair, loose jewelry, rings, and chains to be worn while working with power tools.
- 4.2.21 Make provisions to prevent tools from automatically restarting upon restoration of power. Refer to *S3AM-325-PR Lockout Tagout*.
- 4.3 Training
- 4.3.1 Instruction in the proper use, safe handling, and maintenance of tools will be provided to employees unfamiliar with the tool.
- Assess the employee's training needs as per *S3AM-003-PR1 SH&E Training* procedure.
 - Refer to the applicable work instructions associated with this procedure for any additional training specifics.
 - Training shall include applicable manufacturer's recommendations and guidelines.
- 4.3.2 Employees shall demonstrate knowledge and competency in the use, safe handling and maintenance of the applicable tool prior to operation.
- 4.4 Personal Protective Equipment (PPE)
- 4.4.1 Utilize basic PPE appropriate to the task; gloves, safety-toed boots, hard hats and safety glasses with side shields. Refer to *S3AM-208-PR1 Personal Protective Equipment*.
- 4.4.2 Ensure lockout devices (padlocks, multiple lock hasps, tags) are utilized as necessary. Refer to *S3AM-325-PR Lockout Tagout*.

- 4.4.3 Ensure PPE is appropriate to the work and use additional PPE as required (e.g. mono-goggles, hearing protection, respiratory protection, etc.).
 - Dual eye protection is required to be worn by any employee undertaking or within 3 ½ feet (1 meter) of a task that produces projected particles or material.
 - Head and face protection is recommended for employees working with pneumatic tools.
 - Noise hazard is associated with pneumatic and many other tools. Working with noisy tools such as jackhammers requires proper, effective use of appropriate hearing protection.
- 4.4.4 Screens shall also be set up to protect nearby workers from being struck by flying fragments around chippers, riveting guns, staplers, or air drills.
- 4.4.5 Refer to the applicable work instructions associated with this procedure for any additional specialized PPE.

4.5 Inspections

- 4.5.1 All tools must be inspected prior to each use.
 - Any tool that is defective or has missing parts must not be used.
 - Every broken or defective tool must be tagged 'out of service' or 'do not use' and immediately removed from service.
 - Tagged tools will be returned to the supervisor for repair or replacement.
- 4.5.2 All tools must be inspected to manufacture's specifications and according to tool rests and guard adjustment tolerances. All tools will be inspected to ascertain that all safety devices are present and functioning properly. Refer to *S3AM-305-FM1 Hand & Power Tool Maintenance Inventory* and *S3AM-305-FM2 Hand & Power Tool Inspection Report*.

5.0 Records

- 5.1 None

6.0 Attachments

- 6.1 [S3AM-305-ATT1 Chainsaw](#)
- 6.2 [S3AM-305-ATT2 Circular Saw](#)
- 6.3 [S3AM-305-ATT3 Cut Off Saw](#)
- 6.4 [S3AM-305-ATT4 Handheld Grinder](#)
- 6.5 [S3AM-305-ATT5 Impact Wrench](#)
- 6.6 [S3AM-305-ATT6 Nail Gun](#)
- 6.7 [S3AM-305-ATT7 Dustless Vacuum](#)
- 6.8 [S3AM-305-ATT8 Power Drill](#)
- 6.9 [S3AM-305-ATT9 Pressure Washer](#)
- 6.10 [S3AM-305-ATT10 Reciprocating Saw](#)
- 6.11 [S3AM-305-ATT11 Sander](#)
- 6.12 [S3AM-305-ATT12 Knives](#)



- 6.13 [S3AM-305-ATT13 Clearing & Grubbing Equipment](#)
- 6.14 [S3AM-305-ATT14 Pneumatic Tools](#)
- 6.15 [S3AM-305-ATT15 Manual Hand Tools](#)
- 6.16 [S3AM-305-ATT16 Small Engines](#)
- 6.17 [S3AM-305-ATT17 Electric & Battery Hand Tools](#)
- 6.18 [S3AM-305-FM1 Hand & Power Tool Maintenance Inventory](#)
- 6.19 [S3AM-305-FM2 Hand & Power Tool Inspection Report](#)

Americas

Heavy Equipment

S3AM-309-PR1

1.0 Purpose and Scope

- 1.1 Outline the safe working requirements for working with and near heavy equipment and heavy equipment operation.
- 1.2 Military related vehicles and equipment (e.g. tanks) are not covered under this standard.
- 1.3 This procedure applies to all AECOM Americas-based employees and operations and any other entity and its personnel contractually required to comply with this document's content.

2.0 Terms and Definitions

- 2.1 **Heavy equipment** –All excavating equipment (e.g. scrapers, loaders, crawler or wheel tractors, excavators, backhoes, bulldozers, graders, agricultural and industrial tractors, etc.), cranes, lift trucks, drills, etc. This may include off-highway trucks (e.g. dump truck, heavy haul truck, etc.). For requirements related to crew trucks refer to *S3AM-005-PR1 Driving*.
- 2.2 **Operator** – Any person who operates the controls while the heavy equipment is in motion or the engine is running.
- 2.3 **Ground personnel/workers** – Personnel performing work on the ground around heavy equipment (note: operators are considered ground personnel when outside of the equipment cab).

3.0 References

- 3.1 S3AM-005-PR1 Driving
- 3.2 S3AM-202-PR1 Competent Person Designation
- 3.3 S3AM-213-PR1 Subcontractor Management
- 3.4 S3AM-303-PR1 Excavation
- 3.5 S3AM-322-PR1 Overhead Lines
- 3.6 S3AM-325-PR1 Lockout Tagout
- 3.7 S3AM-331-PR1 Underground Utilities & Subsurface Installation Clearance

4.0 Procedure

- 4.1 Roles and Responsibilities
 - 4.1.1 **Managers / Supervisors**
 - Responsible for confirming all equipment is in good working order and all equipment operators are verified as qualified on the piece of machinery they are assigned.
 - As applicable, review as-built drawings.
 - Maintain operation manuals at the site for each piece of equipment that is present on the site and in use.
 - Maintain a list of operators for the project, and the specific equipment that they are authorized to operate.
 - Prohibit equipment from being operated by any personnel who have not been specifically authorized to operate it.

- Confirm an equipment maintenance inventory is maintained, schedules adhered to and appropriate inspections of equipment are conducted.
- Confirm subcontractors are properly pre-qualified in accordance with *S3AM-213-PR1 Subcontractor Management*.
- Require that subcontractor employees follow established safety procedures in operation, inspection, and maintenance of vehicles and equipment.
- Inform AECOM and subcontractor machinery operators about applicable local regulations restricting the consecutive minutes of engine idling time allowed.
- Confirm subcontractor machinery and mechanized equipment is approved for use in accordance with the requirements of *S3AM-309-FM1 Approval of Machinery & Mechanized Equipment*.
- Confirm that all rented equipment bears any required current certification marks and arrives in proper working order with the manufacturer's operating manual before acceptance from the supplier.
- Confirm that AECOM and subcontractor machinery and mechanized equipment is certified, as applicable, in accordance with manufacturer specifications and/or regulatory requirements.
- Visually observe the subcontractors' vehicles and equipment, for any unsafe conditions or practices. Equipment or operation not in compliance with applicable safety standards is prohibited.

4.1.2 **Employees / Ground Personnel**

- Confirm that all rented equipment arrives in proper working order with the manufacturer's operating manual before acceptance from the supplier.
- Ground personnel when working in the vicinity of heavy equipment shall have received training, and comply with the applicable rules of engagement.

4.1.3 **Operators (of heavy equipment)**

- Operate the equipment safely, maintain full control of the equipment, and comply with manufacturer's operation manual and the laws governing the operation of the equipment.
- Inspect equipment and immediately report defects and conditions affecting the safe operation of the equipment to the appropriate Supervisor.
- Trainees may operate equipment in accordance with jurisdictional requirements and under the direct supervision of a trainer.

4.2 Communication

- 4.2.1 Communication between site Managers / Supervisors, heavy equipment Operators, and site Employees / Ground Personnel is a key method of preventing serious injury or death during heavy equipment operations.
- 4.2.2 Managers shall confirm the Industrial site or project specific SH&E Plan is developed and communicated to all affected and involved employees. Refer to *S3AM-209-PR1 Risk Assessment & Management*.
- 4.2.3 Task Hazard Assessments and Daily Tailgate meetings shall be conducted in accordance with *S3AM-209-PR1 Risk Assessment & Management*.
- 4.2.4 Concerning worksites in which other employers control concurrent operations and SH&E issues related to the worksite, the manager shall coordinate with those conducting concurrent operations to confirm appropriate control measures are in place to protect employees from the hazards associated with activities to be performed.

- Coordination shall occur prior to work commencing, periodically thereafter, and as necessary given changes in scope and/or working conditions.
- Affected employees (including managers and supervisors) shall seek to participate in all site SH&E meetings related to concurrent operations.

4.2.5 The following points outline the communication requirements during heavy equipment operations:

- Site Supervisors/t Managers shall confirm that all operators are notified/informed of when, where, and how many ground personnel will be working on site.
- Site Supervisors/ Managers shall inform all ground personnel before changes are made in the locations of designated work areas.
- Prior to work initiating on site, the Site Supervisor/ Manager is to confirm all operators and ground personnel are trained on the hand signals that will be used to communicate between operators and ground personnel.
- Ground Personnel working around heavy equipment operations are to maintain eye contact with operators to the greatest extent possible (always face equipment). Never approach equipment from a blind spot or angle.
- All heavy equipment whose backup view can be obstructed shall be equipped with reverse warning devices (e.g., backup alarms) that can be significantly heard over equipment and other background noise. Reverse signaling lights shall be in working order.
- When feasible, two-way radios shall be used to verify the location of nearby ground personnel.
- When an operator cannot adequately survey the working or traveling zone, a signal person shall use a standard set of hand signals to provide directions. Flags or other high visibility devices may be used to highlight these signals.

4.3 Ground Personnel

4.3.1 Ground clearance around heavy equipment may significantly reduce hazards posed during heavy equipment operations.

4.3.2 The following points outline the clearance requirements during heavy equipment operations:

- Ground Personnel shall always yield to heavy equipment.
- Ground Personnel shall maintain a suitable "buffer" area of clearance from all active heavy equipment.
- A task hazard assessment that identifies any special precautions shall be completed and communicated to all AECOM personnel associated with or affected by the activity.
- Site Supervisors/ Managers shall designate areas of heavy equipment operation and confirm that all ground personnel are aware of designated areas.
 - Designated areas shall include work zone boundaries and travel routes for heavy equipment.
 - Travel routes shall be set up to reduce crossing of heavy equipment paths and to keep heavy equipment away from ground personnel.
 - Work zone boundaries shall consider line of fire hazards related to the equipment and associated activities. Refer also to *S3AM-309-ATT2 Operator Line of Sight*.
 - If working near heavy equipment, Ground Personnel shall stay clear of loads to be lifted or suspended loads, and out of the travel and swing areas (excavators, all-terrain forklifts, hoists, etc.) of all heavy equipment.
 - During winch use, all swampers or other personnel will remain outside the "whip area" of the winch line or tow cable.

- At a minimum, employees shall maintain a distance of at least two pile lengths from where piles are being cut and dropped, other than in situations where cut piles are being guided to the ground utilizing mechanical means (e.g., pile driver and shackle) to control the direction and speed of fall of the cut pile.
 - When feasible, Site Supervisors/ Managers shall set up physical barriers (e.g., caution tape, orange cones, concrete jersey barriers) around designated areas and confirm that unauthorized ground personnel do not enter such areas.
 - Operators shall stop work whenever unauthorized personnel or equipment enter the designated area and only resume when the area has been cleared.
 - Operators shall only move equipment when aware of the location of all workers and when the travel path is clear.
 - Ground Personnel shall never stand between two pieces of operating heavy equipment or other objects (e.g., steel support beams, trees, buildings, etc.).
 - Ground Personnel shall never stand directly below heavy equipment located on higher ground unless it can be verified ground stability is not a factor and grade of slope is such that it would not contribute to equipment tip-over.
 - Ground Personnel may only enter the swing area, work area or path of travel of any operating equipment when:
 - They have attracted the operator's attention and established eye contact, and
 - The operator has idled the equipment down, placed it in neutral, grounded engaging tools, set brakes and communicated entry is permitted.
 - Employees shall keep all extremities, hair, tools, and loose clothing away from pinch points and other moving parts on heavy equipment.
 - Employees shall not talk, text, or otherwise use a cell phone while standing or walking on a roadway or other heavy equipment path.
- 4.3.3 At a minimum, all Ground Personnel and Operators outside of heavy equipment shall wear the following:
- High visibility safety vest (fluorescent background material and retro-reflective striping) meeting jurisdictional requirements that is visible from all angles.
 - Background material: should be fluorescent yellow-green, fluorescent orange-red or fluorescent red.
 - Combined-performance retro-reflective material (e.g. the stripes): should be fluorescent yellow-green, fluorescent orange-red or fluorescent red - and shall be in contrast (that is, have a distinct color difference) to the background material.
 - Hazards may require high visibility garments that cover torso, legs and arms.
 - Confirm that vest is not faded or covered with outer garments, dirt, etc.
 - American National Standards Institute/Canadian Standards Association- (ANSI/CSA-) approved hard hat
 - ANSI/CSA-approved safety glasses with side shields
 - At a minimum, CSA or ASTM approved, high-cut (min. 6"), puncture, impact and compression resistant footwear.
 - ANSI/CSA-approved hearing protection as needed
 - Appropriate work clothes (e.g., full-length jeans/trousers and a sleeved shirt; no tank, crew tops or other loose clothing permitted).

4.4 Prior to work commencing

4.4.1 All heavy equipment will be inspected pre-shift and then regularly as required with the details of the inspection recorded in a log book.

- Roll-over protection systems (ROPS) and appropriate overhead protection (Fall Object Protection FOP) shall be in place given the specific equipment requirements. Utilize equipment with enclosed cabs where feasible or accessible.
 - Where use of equipment with enclosed cabs is not feasible or said equipment is not accessible, operators shall use any additional personal protective equipment determined as necessary (e.g. goggles, additional hearing protection, etc.).
- Equipment operated in hazardous atmosphere environments shall be equipped with the proper safety equipment (e.g., spark arrestors, positive air shut off, etc.).
- Operation of equipment that has or had cab glass (per the manufacturer's specifications) that is cracked/broken (obstructing the operator's view) or missing is prohibited.
- A locking device shall be provided that will prevent the accidental separation of towed and towing vehicles on every fifth-wheel mechanism and two-bar arrangement.
- Trip handles for tailgates of dump trucks and heavy equipment shall be arranged so that when dumping, the operator will be in the clear.
- The Operator will report defects and conditions affecting the safe operation of the equipment to the Site Supervisor or employer. Any repair or adjustment necessary for the safe operation of the equipment will be made before the equipment is used.
- Exposed moving parts on heavy equipment (belts, gears, shafts, pulleys, sprockets, spindles, drums, fan belts, flywheels, chains, or other reciprocating, rotating or moving parts) which are a hazard to the operator or to other workers will be guarded.
 - If a part will be exposed for proper function it will be guarded as much as is practicable consistent with the intended function of the component.

4.4.2 An approved 4A40BC fire extinguisher shall be present on all heavy equipment. An approved 4A40BC fire extinguisher of appropriate rating shall be present and readily accessible on all heavy equipment.

- Fire extinguishers shall be inspected by the operator prior to heavy equipment operation each shift. Monthly and annual inspections shall be documented.

4.4.3 All Operators shall inspect the area adjacent to the machine prior to starting.

- Evaluate ground conditions, concurrent operations and obstructions to identify approved routes of travel and work areas.
- As applicable, check that there is sufficient swing room and that the outriggers are adequately supported on solid and stable ground

4.4.4 Managers / Supervisors shall inform the operators of the equipment that AECOM employees are in the area and inquire if there are any restricted areas or specific rules or requirements. In some industrial facilities, heavy equipment has the 'right of way'.

4.4.5 Where the Operator will not have a full view of the path of travel, a signal person will be used on the ground that has a full view of the load, the operator, and the path.

4.4.6 All heavy equipment with limited visibility (operator cannot directly or by mirror or other effective device see immediately behind the machine) operated around workers or on a construction site:

- Shall have an audible back-up alarm installed that functions automatically when the vehicle or equipment is put into rear motion.

- All bi-directional equipment shall be equipped with a horn, distinguishable from the surrounding noise level, which shall be operated as needed when the machine is moving in either direction.
- Backing up or movement in both directions for bidirectional equipment shall occur only when a signal person communicates that it is safe to do so if alarms or horns are not feasible.

4.5 Operation

- 4.5.1 The Operator of heavy equipment is the only worker permitted to ride the equipment unless the equipment is equipped by the manufacturer for passengers. Manufacturer operator's manual shall be complied with.
- 4.5.2 A person will not operate heavy equipment unless the person has received adequate instruction and training in the safe use of the equipment, and has demonstrated to a qualified supervisor or instructor competency in operating the equipment.
- Oilers, apprentices, and other operators will not be allowed to operate equipment unless authorized by the Manager.
- 4.5.3 The Operator of heavy equipment will operate the equipment safely, maintain full control of the equipment, and comply with the manufacturer's operator manual and the laws governing the operation of the equipment.
- Operation of company-owned, leased, or rented vehicles or equipment while under the influence of alcohol or illegal drugs or otherwise impaired is prohibited.
 - Do not operate any equipment beyond its safe load or operational limits.
 - Operator shall not talk on, text, or otherwise use mobile phones while operating heavy equipment.
 - Never use bucket teeth or boom for lifting or moving heavy objects.
- 4.5.4 When heavy equipment is used for lifting or hoisting or similar operations there shall be a permanently affixed notation stating the safe working load capacity of the equipment and the notation shall be kept legible and clearly visible to the operator.
- 4.5.5 A Supervisor or Manager will not knowingly operate or permit a worker to operate heavy equipment which is, or could create, an undue hazard to the health or safety of any person. Where compliance is refused, the Manager or his or her designate should be notified immediately.
- 4.5.6 The Operator of heavy equipment will not leave the controls unattended unless the equipment has been secured against inadvertent movement.
- The Operator is not to leave suspended load, machine or part or extension unattended, unless it has been immobilized and secured against inadvertent movement.
 - Turn off heavy equipment, place gear in neutral and set parking brake prior to leaving vehicle unattended.
 - Buckets and blades are to be placed on the ground and with hydraulic gears in neutral when not in use.
 - Brakes shall be set and, as necessary, wheels chocked or equivalent (as applicable) when not in use.
- 4.5.7 The Operator will maintain the cab, floor and deck of heavy equipment free of material, tools or other objects which could create a tripping hazard, interfere with the operation of controls, or be a hazard to the operator or other occupants in the event of an accident.
- 4.5.8 If heavy equipment has seat belts required by law or manufacturer's specifications, the Operator and passengers will use the belts whenever the equipment is in motion, or engaged in an operation which could cause the equipment to become unstable.

- Seat belts shall be maintained in functional condition, and replaced when necessary to ensure proper performance.
- 4.5.9 All vehicles transporting material or equipment on public roads shall comply with local laws pertaining to weight, height, length, and width. Obtain any permits required for these loads.
- 4.5.10 Never jump on to or off of a piece of heavy equipment, always maintain 3-points of contact at a minimum.
- 4.5.11 Never exit heavy equipment while it is in motion.
- 4.5.12 Do not ride with arms or legs outside of the truck body of equipment cab.
- Never ride on the outside of a piece of heavy equipment (e.g. in a standing position on the body, on running boards, or seated on side fenders, cabs, cab shields, rear of truck bed, on the load, bucket, etc.).
- 4.5.13 Have vehicle headlights on at all times when driving in the area.
- 4.5.14 Park motor vehicles off the haul roads, or away from the work areas.
- 4.5.15 Do not wear loose clothing or jewelry where there is a danger of entanglement in rotating equipment.
- 4.5.16 Do not enter the swing area of machines such as cranes, heavy drill rigs, or excavators, without first making eye contact with the operator, and receiving permission to do so. Refer to *S3AM-309-ATT2 Operator Line of Sight*.
- 4.5.17 Stay out of the blind areas around heavy equipment and never assume that the equipment operators have seen you or are aware of your presence.
- 4.5.18 Maintain a distance of at least 2 feet (60 centimeters) between the counterweight of swing machines and the nearest obstacle. If this distance cannot be maintained, a spotter shall observe and be in constant communication with the operator to prevent contact.
- 4.5.19 Vibrations from moving traffic or heavy equipment can cause excavations or spoil piles to become unstable.
- Excavation activity shall be conducted according to *SOP S3AM-303-PR1 Excavation*.
 - Equipment not involved in the excavating activity or not required to be in the vicinity shall keep clear. Equipment that shall operate in the vicinity shall maintain appropriate setback distances from edges of excavations or spoil piles.
- 4.5.20 All heavy equipment shall be operated in a safe manner that will not endanger persons or property.
- When ascending or descending grades in excess of 5 percent, loaded equipment shall be driven with the load upgrade.
 - When operating an electric-powered, remote controlled, hydraulic device used for demolishing concrete structures and refractory linings as well as excavating, refer to the *S3AM-309-ATT1 Brokk 180* for more specifics.
- 4.5.21 All heavy equipment shall be operated at safe speeds. Do not drive any vehicle at a speed greater than is reasonable and safe for weather conditions, traffic, intersections, width, and character of the roadway, type of motor vehicles, and any other existing condition.
- 4.5.22 Always move heavy equipment up and down the face of a slope. Never move equipment across the face of a slope.
- 4.5.23 Slow down and stay as far away as possible while operating near steep slopes, shoulders, ditches, cuts, or excavations.
- 4.5.24 When feasible, Operators shall travel with the "load trailing", if the load obstructs the forward view of the operator.



- 4.5.25 Slow down and sound horn when approaching a blind curve or intersection. Signal people equipped with 2-way radio communications may be required to adequately control traffic.
- 4.5.26 All haulage equipment / trucks, whose payload is loaded by means of cranes, power shovels, loaders, or similar equipment, shall have a cable shield and/or canopy adequate to protect the operator from shifting or falling material. If protection is not available for the operator, the operator shall leave the vehicle and wait in a designated safe location until it is loaded..
- 4.5.27 Equipment shall be shut down prior to and during fueling.
 - Confirm proper grounding/ bonding between equipment and fuel vehicle prior to fueling operations.
 - During fuel operations confirm fuel nozzle remains in contact with the tank.
 - Do not smoke, use electrical devices or have an open flame present while fueling.
 - Fuel shall not be carried in or on heavy equipment, except in permanent fuel tanks or approved safety cans.
- 4.5.28 Site vehicles will be parked in a designated parking location away from heavy equipment.
- 4.5.29 Operators shall never push/pull "stuck" or "broken-down" equipment unless a spotter determines that the area is cleared of all personnel around and underneath the equipment.
- 4.5.30 If designated for work in contaminated areas/zones, equipment shall be kept in the exclusion zone until work or the shift has been completed. Equipment will be decontaminated within designated decontamination areas.
- 4.5.31 Equipment left unattended at night adjacent to travelled roadways shall have appropriate lights or reflectors, or barricades equipped with appropriate lights or reflectors, to identify the location of that equipment, and shall not be closer than 6 feet (1.8m) (or the regulatory requirement for the work location) to the active roadway.
- 4.5.32 Rubber / pneumatic-tired earthmoving haulage equipment shall be equipped with fenders on all wheels. Mud flaps may be used in lieu of fenders whenever motor vehicle equipment is not designed for fenders.
- 4.5.33 Lift trucks shall have the rated capacity clearly posted on the vehicle, and the ratings are not to be exceeded.
- 4.5.34 Steering or spinner knobs shall not be attached to steering wheels.
- 4.5.35 High-lift rider industrial trucks shall be equipped with overhead guards.
- 4.5.36 All hot surfaces of equipment, including exhaust pipes or other lines, that present a possible injury or fire hazard, shall be guarded or insulated.
- 4.5.37 All equipment having a charging skip shall be provided with guards on both sides and open end of the skip area to prevent persons from walking under the skip while it is elevated.
- 4.5.38 Platforms, foot walks, steps, handholds, guardrails, and toeboards shall be designed, constructed, and installed on machinery and equipment to provide safe footing and access ways.
- 4.5.39 Substantial overhead protection shall be provided for the operators of fork lifts and similar equipment.
- 4.5.40 In an effort to reduce air emissions, fuel costs, and run-time hours (that can impact equipment warranty), operators shall limit heavy equipment engine idling to not more than five consecutive minutes. Local regulations at the location of the vehicle operation could require less than five consecutive minutes idling time. The idling limit does not apply to:
 - Idling when queuing.
 - Idling to verify that the vehicle is in safe operating condition.

- Idling for testing, servicing, repairing or diagnostic purposes.
- Idling necessary to accomplish work for which the vehicle was designed (cranes, man-lifts, forklifts, etc.)
- Idling required to bring equipment/vehicle to operating temperature, as specified by the manufacturer. Engine heaters shall be used for cold weather starting to avoid engine idling where feasible.
- Idling necessary to ensure safe operation of the vehicle.
- Idling to keep equipment (including windows) clear of ice and snow.
- Idling to provide air conditioning or heat to ensure the health and safety of the operator, but only when seated inside the equipment or vehicle.

4.6 Utilities

- 4.6.1 When contacted by heavy equipment, aboveground and underground utilities may cause severe injuries or death as a result of electrocution, explosion, etc. Refer to the *S3AM-322-PR1 Overhead Lines* procedure for more specifics.
- 4.6.2 The following outline the requirements while performing heavy equipment operations that may lead to contact with aboveground or underground utilities:
- Always be aware of surrounding utilities.
 - Confirm all equipment (e.g., dump trailers, loaders, excavators, etc.) is lowered prior to moving underneath aboveground utilities.
 - Confirm utilities are cleared and identified prior to beginning any earthmoving operation. Contact the local utility service providers for clearance prior to performing work. Confirm documentation of the contact is made; date, number; contact name, organization, etc. Refer to *SOP S3AM-303-PR1 Excavation* and *S3AM-331-PR1 Underground Utilities & Subsurface Installation Clearance*.

4.7 Training

- 4.7.1 The Operator or other qualified supervisor will provide all on-site personnel with an orientation to the heavy equipment and its associated hazards and controls.
- 4.7.2 Only designated, qualified personnel shall operate heavy equipment.
- 4.7.3 Operators shall have all appropriate jurisdictional licenses or training to operate a designated piece of heavy equipment.
- 4.7.4 Operators shall be evaluated through documented experience and routine monitoring of activities unless the equipment is operated by an AECOM operator in which case a practical evaluation is required. Operators shall be knowledgeable and competent in the operation of a designated piece of heavy equipment.

4.8 Inspection and Maintenance

- 4.8.1 Maintenance records for any service, repair or modification which affects the safe performance of the equipment will be maintained and be reasonably available to the operator and maintenance personnel regulatory agencies upon request during work hours.
- 4.8.2 Maintenance records will be maintained on the site or project for heavy equipment.
- 4.8.3 Conduct maintenance as prescribed by the manufacturer in the Operation Manual for each piece of equipment.
- 4.8.4 Servicing, maintenance and repair of heavy equipment will not be done when the equipment is operating.
- Lockout and tagout safety procedures are followed. Refer to *S3AM-325-PR1 Lockout Tagout*.

- Motors are turned off, unless required for performing maintenance or repair.
 - All ground-engaging tools are grounded or securely blocked.
 - Controls are set in a neutral position and brakes are set.
 - Electrically driven equipment is installed with provision for tagging and locking out the controls while under repair.
 - Manufacturer's requirements for maintenance and repair are followed.
 - If continued operation is essential to the process, a safe means of protection shall be provided.
 - Provide and use a safety tire rack, cage, or equivalent protection when inflating, mounting, or dismounting tires installed on split rims, or rims equipped with locking rings or similar devices.
- 4.8.5 All heavy equipment shall have a documented inspection and if necessary, repaired prior to use.
- Operators shall not operate heavy equipment that has not been cleared for use.
 - All machinery and mechanized equipment will be verified to be in safe operating condition (refer to *S3AM-309-FM1 Approval of Machinery & Mechanized Equipment*) by a competent person (refer to *S3AM-202-PR1 Competent Person Designation*) within seven days prior to operation on a new site or project. Clearance is valid for up to one year for the given site or project.
 - As applicable, all machinery and mechanized equipment shall be inspected / certified and tested at appropriate intervals as required by the manufacturer and/or regulatory requirements.
- 4.8.6 All heavy equipment shall be inspected at a minimum to the manufacturer's recommendations prior to each work shift. All defects shall be reported to the Supervisor/ Manager immediately.
- Defective heavy equipment shall be immediately tagged and taken out of service until repaired.
 - Inspection, maintenance, service and repair records shall be maintained at the site. If a manufacturer's or company-specific inspection checklist is not provided, use *S3AM-309-FM2 Heavy Machinery Pre-Operation Checklist*.
 - Records shall be made available for review upon request. Note: Documents may be electronically stored in the project files.
- 4.9 Fueling and batteries
- 4.9.1 A well-ventilated area shall be used for refueling.
- 4.9.2 Only the type and quality of fuel recommended by the engine manufacturer shall be used.
- 4.9.3 Fuel tanks shall not be filled while the engine is running. All electrical switches shall be turned off.
- 4.9.4 If there is potential to spill fuel on hot surfaces, the surfaces shall be permitted to cool down prior to fueling. Any spillage shall be cleaned before starting engine.
- 4.9.5 Spilled fuel shall be cleaned with cotton rags or cloths and disposed of in the proper receptacle; do not use wool or metallic cloth.
- 4.9.6 Open flames, lighted smoking materials, sparking equipment or any other type of ignition source shall remain a minimum of 35' (10.7m) from the fueling area and/or fuel source. This clearance shall be increased if required or conditions warrant.
- 4.9.7 Heaters in carrier cabs shall be turned off when refueling the carrier or the drill rig.
- 4.9.8 Portable containers to be filled shall be placed directly on the ground or be properly grounded prior to filling to prevent creation of a static charge. Portable fuel containers shall not be filled completely to allow expansion of the fuel during temperature changes.
- 4.9.9 Control electrostatic hazards.

- Before activating fuel pump, touch some part of vehicle / equipment to de-energize any static electricity that may be present.
 - The fuel nozzle shall be kept in contact with the tank being filled to prevent static sparks from igniting the fuel.
 - Fuel containers and transfer hoses shall be kept in contact with a metal surface during travel to prevent build-up of a static charge.
- 4.9.10 Portable fuel containers shall not travel in the vehicle or carrier cab with personnel.
- 4.9.11 Batteries shall be serviced in a ventilated area while wearing appropriate Personal Protective Equipment.
- 4.9.12 When a battery is removed from a vehicle or service unit, the battery shall be disconnected ground post first. Consult the SDS applicable to the battery and/or contents for additional information including; handling, precautions, and first aid measures.
- Spilled battery acid shall be immediately flushed off the skin with a continuous supply of water. Battery storage or maintenance areas shall have readily accessible eye wash stations.
 - Should battery acid get into the eyes, the eyes shall be flushed immediately with copious amounts of water and medical attention shall be sought immediately.
- 4.9.13 When installing a battery, the battery shall be connected ground post last.
- 4.9.14 When charging a battery, cell caps shall be loosened prior to charging to permit gas to escape.
- 4.9.15 When charging a battery, the power source shall be turned off to the battery before either connecting or disconnecting charger loads to the battery posts.
- 4.9.16 To avoid battery explosions, the cells shall be filled with electrolytes. A flashlight (not an open flame) shall be used to check water electrolyte levels. Avoid creating sparks around batteries by shorting across a battery terminal. Lighted smoking materials and flames shall be kept at least a minimum of 35 feet (10.7 meters) away from battery-charging stations.

5.0 Records

- 5.1 Inspection, maintenance, service and repair records shall be maintained with the equipment.

6.0 Attachments

- 6.1 [S3AM-309-ATT1 Brokk180 Safety Card](#)
- 6.2 [S3AM-309-ATT2 Operator Line of Sight](#)
- 6.3 [S3AM-309-FM1 Approval of Machinery & Mechanized Equipment](#)
- 6.4 [S3AM-309-FM2 Heavy Machinery Pre-Operation Checklist](#)
- 6.5 [S3AM-309-FM3 Rubber Tire Backhoe Operator Skill Evaluation](#)
- 6.6 [S3AM-309-FM4 Scraper Operator Skill Evaluation](#)
- 6.7 [S3AM-309-FM5 Bull Dozer Operator Skill Evaluation](#)
- 6.8 [S3AM-309-FM6 Dump Truck Operator Skill Evaluation](#)
- 6.9 [S3AM-309-FM7 Roller Compactor Operator Skill Evaluation](#)
- 6.10 [S3AM-309-FM8 Front End Loader Operator Skill Evaluation](#)
- 6.11 [S3AM-309-FM9 Grader Operator Skill Evaluation](#)
- 6.12 [S3AM-309-FM 10 Excavator Operator Skill Evaluation](#)
- 6.13 [S3AM-309-FM11 Water Truck Operator Skill Evaluation](#)

Heavy Equipment (S3AM-309-PR1)
Revision 6 July 31, 2019

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Page 11 of 12

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- 6.14 [S3AM-309-FM12](#) [Heavy Equipment Maintenance Inventory](#)
- 6.15 [S3AM-309-FM13](#) [Heavy Equipment Inspection Report](#)

Americas

Wildlife, Plants & Insects

S3AM-313-PR1

1.0 Purpose and Scope

- 1.1 Communicates the requirements and precautions to be taken by AECOM employees to protect against the biological hazards associated with insects, arachnids, snakes, poisonous plants, and other animals referred to herein collectively as “biological hazards”.
- 1.2 This procedure applies to all AECOM Americas-based employees and operations and any other entity and its personnel contractually required to comply with this document’s content.

2.0 Terms and Definitions

- 2.1 **Field Work** – Any activity conducted at a site that contains brush, overgrown grass, leaf litter, poisonous plants, or is located near mosquito breeding areas and includes work in structures where animals might exist that harbor fleas or ticks or where spiders and mites could be present. Field work includes, but is not limited to, Phase I, Phase II, Operations Monitoring & Maintenance, biological surveys, and other work that meets the definition of field work.
- 2.2 **Poisonous** – Capable of harming or killing by or as if by poison; toxic or venomous.
- 2.3 **Phase I Environmental Site Assessment** – Investigation of real property to determine the possibility of contamination, based on visual observation and property history, but no physical testing. Under new Environmental Protection Agency regulations that went into effect on November 1, 2006, a Phase I, as it is called for short, will be mandatory for all investors who wish to take advantage of Comprehensive Environmental Response, Compensation, and Liability Act defenses that will shield them from liability for future cleanup, should that prove necessary. The new Phase I rules, called “All Appropriate Inquiry” or AAI, also require more investigation than previously mandated. Investors can expect to see dramatic price increases over prior experiences.
- 2.4 **Phase II Environmental Site Assessment** – Investigation of real property through physical samplings and analyses to determine the nature and extent of contamination and, if indicated, a description of the recommended remediation method.

3.0 References

- 3.1 RS2-001-PR1 Firearms Standard
- 3.2 S3AM-004-PR1 Incident Reporting, Notifications & Investigation
- 3.3 S3AM-008-PR1 Fitness for Duty
- 3.4 S3AM-113-PR1 Heat Stress
- 3.5 S3AM-208-PR1 Personal Protective Equipment
- 3.6 S3AM-209-PR1 Risk Assessment & Management

4.0 Procedure

- 4.1 Roles and Responsibilities
 - 4.1.1 **Managers / Supervisors**
 - Responsible for managing field work.

- Work with employees to see that a Task Hazard Analysis (THA) for the work to be conducted has been performed prior to the beginning of the field work and that it includes an assessment of potential biological hazards.
- Implement control measures at the location to reduce the potential for employees to be exposed to injuries and illnesses from biological hazards while working.
- If the exposures cannot be eliminated or managed with engineering controls, approve the use and cost of Personal Protective Equipment (PPE) and protective repellents and lotions and confirm that exposed employees have and use these products.

4.1.2 SH&E Manager

- Confirm training and guidance is provided to employees consistent with this procedure.
- During the performance of site visits, assess the precautions being taken against biological hazards for compliance with this procedure.
- Assist AECOM personnel in identifying hazards and selecting appropriate control measures.
- As applicable, review and approve relevant SH&E Plans for locations that have biological hazards.

4.1.3 Employees

- Participate in required training related this procedure.
- Participate in the development of THAs for the task, identify control measures to limit exposure and request PPE, repellents, and protective lotions identified by this procedure.
- Update the applicable THA when a new, unaccounted for biological hazard is identified. Employee shall stop work to identify appropriate elimination or control measures (and obtain any necessary guidance) before continuing work.
- Obtain approval from Managers and/or Supervisors to purchase selected PPE prior to purchasing.
- Implement the precautions appropriate to prevent exposure to the hazardous wildlife, insects and plants.
- Observe requirements for reporting (e.g. tick bites, skin irritations, etc.) as detailed within the procedure and attachments.

4.2 Training

4.2.1 Employees shall be trained to recognize organisms that represent a threat in the regions in which they work – experienced field staff shall provide on the job training to assist staff with hazard recognition.

4.2.2 Employees shall be properly trained to the anticipated tasks and the associated required PPE.

4.3 Overview

4.3.1 The procedures discussed below are detailed because these hazards have historically posed the most significant risk to AECOM employees. Note that this discussion is not a fully encompassing list of hazards. As part of the SH&E Plan and THA developed by the AECOM personnel, in accordance with *S3AM-209-PR1 Risk Assessment & Management*, additional consideration shall be given to other biological hazards.

4.3.2 Departments of Public Health local to the worksite, as well as the Centers for Disease Control (CDC) can serve as a resource for identifying biological hazards not discussed in this procedure.

4.3.3 If additional biological hazards are identified, employees should stop work and contact the SH&E Manager to discuss the hazards and identify effective control measures. Those control measures shall be implemented at the location prior to restarting work.

4.4 Employee Sensitivity

- 4.4.1 Sensitivity to toxins generated by plants, insects and animals varies according to dosage and the ability of the victim to process the toxin; therefore, it is difficult to predict whether a reaction will occur, or how severe the reaction will be. Employees should be aware that there are a large number of organisms capable of causing serious irritations and allergic reactions. Some reactions will only erupt if a secondary exposure to sunlight occurs. Depending on the severity of the reaction, the result can be severe scarring, blindness or even death.
- 4.4.2 Employees also need to consider whether they are sensitive to the use of insect repellents.

4.5 Planning and Hazard Assessment

- 4.5.1 AECOM personnel shall confirm that the potential for exposure to specific biological hazards are assessed prior to the commencement of work and that the procedures specified by this procedure are integrated into the THA planning process and conveyed to employees conducting the field work. This information shall be communicated in the location-specific SH&E plan, the THA, pre-project kickoff meetings, and tailgate meetings at the location.
- 4.5.2 It is important to note that the precautions to be taken by employees to decrease the risk of exposure to biological hazards can directly increase the risk of heat-related illness due to thermal stresses. Therefore, heat stress monitoring and precautions shall be included as a critical component of the task-specific THA in accordance with *S3AM-511-PR1 Heat Stress*.
- 4.5.3 During the preparation of the location-specific SH&E plan and task specific THA, Managers, Supervisors, and employees shall determine what biological hazards might be encountered during the task or operations and shall prescribe the precautions to be taken to reduce the potential for exposure and the severity of resulting illnesses. Consideration will be given to conditions such as weather, proximity to breeding areas, host animals, and published information discussing the presence of the hazards.
- 4.5.4 It should be assumed that at least one of the biological hazards exists whenever working on undeveloped property. This can include insect activity any time that local temperatures exceed 40 degrees Fahrenheit (4.5 degrees Celsius) for a period of more than 24 hours. The stubble and roots of poisonous plants can be a hazard any time of year, including when some plants are dormant or mown.
- 4.5.5 The hazard assessments shall also consider the additional hazards posed by vegetative clearing such as the increased risk of coming in contact with poison ivy, oak or sumac and hazards associated with the use of tools and equipment to remove vegetation.
- 4.5.6 Employees in the field where biological hazards exist shall not enter the hazard areas unless they are wearing the appropriate protective clothing, repellents, and barrier creams specified below. If the hazard is recognized in the field but was not adequately assessed during the THA, the field staff shall stop work and not proceed until the THA has been amended and approved and protective measures implemented.
- 4.5.7 Employees who have severe allergic reactions are strongly recommended to notify their Manager, field Supervisor and co-workers of the potential for a reaction and demonstrate what medication they might need, where they keep it and how it is administered.
- 4.5.8 A decision flow chart and table for determining the potential for biological hazards in the Americas has been provided in *S3AM-313-ATT1 Biological Hazard Assessment Flow Chart*.

4.5.9 Restrictions:

- No firearms or weapons are allowed to be used without express permission by the Region Executive and Chief Resilience Officer, refer to the *RS2-001-PR1 Firearms Standard*.
- No weapons related work shall occur without an assessment that includes appropriate hazard control measures and training.

- Staff with life-threatening reactions shall not undertake work in areas infested with the allergen (e.g., wasps, poison ivy), unless precautions are met which satisfy a medical practitioner's requirements. Refer to *S3AM-008-PR1 Fitness for Duty*.

4.5.10 Precautions

- Be aware of the potential irritants in your area and know how to recognize them.
- Modify activities to avoid encounters (diurnal rhythms, seasonal rhythms).
- Avoid wearing perfume and cologne and strong smelling deodorants, lotions, soaps, and shampoos.
- When working in areas where there may be small insects that "hitchhike" (e.g., ticks, spiders, scorpions), it is recommended that clothes are turned inside out and shaken at the end of day; do not wear same clothes two days in a row.
- Staff should always be aware of where they are placing their hands, or where they are sitting in order to avoid contact with potential toxins. Avoid reaching into areas where visibility is limited.

4.6 Wildlife Hazards (Wild Animals, Reptiles and Birds)

4.6.1 Employees shall not work alone in areas where the risk of an encounter with dangerous wildlife is high. Wildlife handling shall only be completed under direct supervision of an experienced individual. Refer to the following work instructions for more specifics:

- *S3AM-313-ATT13 Alligators*
- *S3AM-313-ATT9 Large Carnivores & Ungulates*
- *S3AM-313-ATT10 Bear Safety*
- *S3AM-313-ATT11 Small Mammals*
- *S3AM-313-ATT12 Snakes & Scorpions*

4.7 Ticks, Spiders and other Insects

4.7.1 Insects for which precautionary measures should be taken include but are not limited to: mosquitoes (potential carriers of disease aside from dermatitis), black flies, wasps, bees, ticks, fire ants and European fire ants.

4.7.2 Employees with known allergies to insect stings should consult their personal physician for advice on any immediate medications that they should carry with them. Epi-pens¹ shall be carried at all times in the field by employees who are aware that anaphylactic shock is a possibility for them. AECOM highly recommends that employees with known allergies inform their co-workers of the allergy and the location of the medications they might carry for the allergy.

4.7.3 Habitat Avoidance, Elimination and/or Control

- The most effective method to manage worker safety and health is to eliminate, avoid and/or control hazards. Clearing the location of brush, high grass and foliage reduces the potential for exposure to biological hazards. Clearing will not eliminate the exposure to flying insects and there might be an increased exposure to ticks and spiders during the clearing process.
- Projects such as subsurface environmental assessment or remediation are often candidates for brush and overgrown grass to be cleared. In these instances, the Manager shall either request that the client eliminate vegetation, or request approval from the client to have vegetation clearing added to the scope of work.
 - It should be noted that vegetation clearance may unintentionally serve to spread noxious and poisonous plant materials around the site.

¹ *Epi-pens must be prescribed by a personal physician. Renew epi-pens on a regular schedule to ensure effectiveness and make sure your field companions know where it is and how to use it if you cannot self-administer the dose.*

- As applicable, measures should be taken to prevent spread, such as but not limited to, confirming equipment and materials are not placed on affected areas, and equipment is decontaminated after use and before removal from site.
- When work shall be conducted in areas that cannot or may not be cleared of foliage, personal precautions and protective measures shall be prescribed.
- Mosquitoes breed in stagnant water and typically only travel a quarter mile (less than half a kilometer) from their breeding site. Whenever possible, stagnant water should be drained to eliminate breeding areas. Managers and client site managers should be contacted to determine whether water can be drained and the most appropriate method for draining containers, containment areas, and other objects of standing water.
- If water cannot be drained, products similar to Mosquito Dunks® can be placed in the water to control mosquitoes. Once wet, the Mosquito Dunks® kill the immature, aquatic stage of the mosquito. The active ingredient is a beneficial organism that is lethal to mosquito larvae, but harmless to fish, humans, and other animals. Mosquito Dunks® provide long-term protection for 30 days or more.

4.7.4 Ticks

- Ticks can be encountered when walking in tall grass or shrubs. They crawl up clothing searching for exposed skin where they will attach themselves. The most serious concern is a possibility of contracting a disease.
- Data from the CDC indicates that tick-borne diseases have become increasingly prevalent. At the same time, tick repellents have become both safe and effective so it is possible to prevent the vast majority of bites and, therefore, most related illnesses. The use of permethrin is strongly advised.
- The most common and severe tick-borne illnesses in the U.S. are Lyme disease, Ehrlichiosis, and Rocky Mountain spotted fever. A summary table listing CDC informational resources for these diseases is provided in *S3AM-313-ATT2 Ticks* along with a listing of CDC information resources and maps showing the distribution of common tick-borne diseases in the U.S.
- When working in areas where ticks may occur, it is recommended that clothes are turned inside out and shaken at the end of day; do not wear the same clothes two days in a row.
- Employees should conduct a thorough full body tick check upon exiting the field. Shower within two hours of coming indoors to help wash away loose ticks. Clothes should be laundered in hot water or tumble dry clothes in a dryer on high heat for 10 minutes to kill ticks.
- To remove ticks that are embedded in skin, utilize a tick key. Alternatively use tweezers or fingers to carefully grasp the tick as close to the skin as possible and pull slowly upward, avoiding twisting or crushing the tick. Do not try to burn or smother the tick. Cleanse the bite area with soap and water, alcohol, or household antiseptic. Note the date and location of the bite and save the tick in a secure container such as an empty pill vial or film canister. A bit of moistened paper towel placed inside the container will keep ticks from drying out. Follow AECOM incident reporting guidelines to report the tick bite within 4 hours and notify the Manager or Supervisor.
- Familiarize yourself with the characteristic bulls-eye pattern of Lyme disease infection surrounding the bite. If you notice this type of pattern or rash resulting from a tick bite, immediately report the issue to your supervisor and follow the incident reporting requirements for your business group.
- If you experience symptoms such as fever, headache, fatigue, and a skin rash, you should immediately visit a medical practitioner as Lyme disease is treated easily with antibiotics in the early stages, but can spread to the heart, joints, and nervous system if left untreated.

4.7.5 Chiggers

- Chiggers are mite larvae, approximately ½ millimeter in size, and typically invisible to the naked eye. While chiggers are not known to carry infectious diseases, their bites and resulting rashes and itching can lead to dermatitis and a secondary infection.
- Chiggers are typically active from the last hard freeze in the winter or spring to the first hard freeze. They are active all year in the Gulf Coast and tropical areas.

4.7.6 Spiders

- Spiders can be found in derelict buildings, sheltered areas, basements, storage areas, well heads and even on open ground. Spiders can be found year round in sheltered areas and are often present in well heads and valve boxes.
- Most spider bites produce wounds with localized inflammation and swelling. The Black Widow and Brown Recluse spiders in the U.S. and others outside the U.S. inject a toxin that causes extensive tissue damage and intense pain.
- Additional information on spider identification can be found in attachment *S3AM-313-ATT3 Poisonous Spider Identification*.

4.7.7 Mosquitoes

- When a mosquito bites, it injects an enzyme that breaks down blood capillaries and acts as an anticoagulant. The enzymes induce an immune response in the host that results in itching and local inflammation. The tendency to scratch the bite sites can lead to secondary infections.
- CDC data indicates that mosquito-borne illnesses, including the strains of encephalitis, are a health risk. At least one of the Encephalitis strains listed below is known to exist in every area of the U.S. and in many other countries as well:
 - Eastern Equine encephalitis
 - Western Equine encephalitis
 - West Nile Virus
 - St. Louis encephalitis
 - La Crosse encephalitis
- Mosquitoes can transmit the West Nile Virus and other forms of encephalitis after becoming infected by feeding on the blood of birds which carry the virus.
- Most people infected with the virus experience no symptoms or they have flu-like symptoms. Sometimes though, the virus can cause severe illness, resulting in hospitalization and even death, so proper precautions should be taken. Consult a medical practitioner if you suspect you have West Nile Virus. Other diseases including Dengue Fever and Malaria are spread by mosquitoes in the sub-tropic and tropical parts of the world. See *S3AM-313-ATT4 Mosquito Borne Diseases* for information on the locations where mosquito borne diseases are known to be present.

4.7.8 Bees, Wasps and Hornets

- Wasps and bees will cause a painful sting to anyone if they are harassed. They are of most concern for individuals with allergic reactions who can go into anaphylactic shock. Also, instances where an individual is exposed to multiple stings can cause a serious health concern for anyone. These insects are most likely to sting when their hive or nest is threatened.
- Bees, hornets, and wasps may be found in derelict buildings, sheltered areas, behind covers or lids and even on open ground. Other protective measures are not normally effective against aggressive, flying insects. Be aware of the potential areas for these types of insects, approach these locations cautiously. Avoid reaching into areas where visibility is limited.
- If you see a nest in the area you are working in stop work. Contact the Manager or Site Supervisor for procedures to have the nest removed.

- If stung by a wasp, bee or hornet, notify a co-worker or someone who can help should you have an allergic reaction. Stay calm and treat the area with ice or cold water. Follow AECOM incident reporting guidelines to report the sting within 4 hours and notify the Manager or Supervisor immediately. Seek medical attention if you have any reactions to the sting such as developing a rash, excessive swelling or pain at the site of the bite or sting, or any swelling or numbness beyond the site of the bite or sting.

4.7.9 Fire Ants

- The fire ant (southern and western U.S.) and the European fire ant (northeastern U.S. and eastern Canada) is often very abundant where it is established. It is very aggressive and commonly climbs up clothing and stings unprovoked when it comes into contact with skin. Painful irritations will persist for an hour or more.

4.7.10 Personal Protective Equipment (PPE)

- Chemically-treated field clothing, full-length clothing, or Tyvek® coveralls.
- Gloves shall also be worn consistent with the recommendations of the site-specific SWP and/or THA to minimize hand exposure.
- Where ticks, chiggers, and spiders are presumed to exist, the Tyvek® or chemically treated clothing will be taped to the work boots.
- See *S3AM-313-ATT2 Ticks* for configuration of clothing for protection against ticks and insects.
- Application of insect repellent to clothing and/or exposed skin. Oil of lemon eucalyptus, DEET, and Permethrin have been recommended by the CDC for effective protection against mosquitoes that may carry the West Nile virus and related diseases.
- Note that DEET will reduce the effectiveness of Fire Resistance Clothing (FRC) and should not be applied to this clothing. If working in FRC, employees can use Permethrin as it has been shown not to reduce the effectiveness of FRC. Permethrin will need to be applied to FRC well in advance of the planned work. If permethrin is unavailable employees can apply DEET to their skin and let dry prior to putting FRC on.
 - Oil of Lemon Eucalyptus is a plant-based insect repellent on the market as Repel Lemon Eucalyptus. The products have been proven to be effective against mosquitoes, deer ticks, and no-see-ums for up to six hours. Derived from Oil of Lemon Eucalyptus, this non-greasy lotion or spray has a pleasant scent and is not known to be toxic to humans. The spray or lotions will be effective for approximately two to six hours and should be reapplied every two hours to sustain protection. Lemon Eucalyptus products cannot be applied to fire retardant clothing.
 - Permethrin is an insecticide with repellent properties registered with the Environmental Protection Agency and recommended by the CDC.
 - Permethrin is highly effective in preventing tick bites when applied to clothing, but is not effective when applied directly to the skin. Two options are available for Permethrin treatment of clothing worn during field work: 1) pre-treatment of fabric by the clothing manufacturer; or 2) manual treatment of their personal clothing using Permethrin spray in accordance with manufacturers recommendations. This will likely require treatment at home or the office prior to field mobilization. Caution should be used when applying Permethrin as it is highly toxic to fish and house cats. AECOM strongly recommends the first option (employees obtaining pre-treated clothing) to avoid the time required, potential risk, and housekeeping issues involved with manually treating the clothing with spray. Purchase pre-treated clothing in accordance with *S3AM-208-PR1 Personal Protective Equipment* and with the approval of your Supervisor or Manager.
 - The Permethrin pre-treatment is odorless and retains its effectiveness for approximately 25 washings. After 25 washings, the pre-treated clothing will be

considered no longer effective and removed from service. Clothing that has been manually treated by employees will be considered effective for five wash cycles.

- Also, use of clothing that has been pre-treated with Permethrin offers a reduction in the use and application of other insect repellents that shall be applied directly to the skin. Supervisor or Manager approval is required prior to purchase.
- If the employee opts not to utilize chemically pre-treated clothing while potentially exposed to insects, spiders and/or ticks, they shall either: 1) wear Tyvek® coveralls taped to the boots, or 2) wear full-length clothing consisting of long-legged pants and long-sleeved shirts treated with an insect repellent containing Permethrin, DEET, or an oil of lemon eucalyptus to their work clothing.
- Safety Data Sheets (SDS) for the repellents, lotions, and cleansers discussed in this Procedure are not required because the repellents, lotion, and clothing are consumer products used in the manner intended for the general public. Although not required, a SDS should be obtained for the products used and placed into the office SDS library and site-specific safety plan.

4.8 Poisonous Plants

4.8.1 Habitat Avoidance, Elimination and/or Control

- If poisonous plants are identified in the work area, employees will mark the plants using either flags or marking paint, and discuss what the specific indicator will be to signal to other employees to avoid the designated area. If employees decide to use ground-marking paint to identify poisonous plants, they should discuss this tactic with the Manager (and Client as appropriate) for approval.
- If removal of the plants is considered, it should be subcontracted to a professional landscaping service that is capable and experienced in removing the plant. If herbicides are considered for use, a discussion shall need to occur with the Manager (and Client as appropriate) to determine whether it is acceptable to apply herbicides at the work site. Application of herbicides may require a license.
- Employees shall not attempt to physically remove poisonous plants from the work area unless a clearing procedure, including PPE, is prepared in advance and approved by the SH&E Manager. The clearing procedure should be included in the SH&E Plan and THA and the required PPE specified.

4.8.2 Poisonous plants that employees should recognize and take precautions to avoid include: poison sumac, poison ivy (terrestrial and climbing), poison oak, giant hogweed² (or giant cow parsnip), wild parsnip, devil's club and stinging nettle. Many others are extremely poisonous to eat (e.g., poison hemlock; water parsnip) – do not eat anything that has not been identified. Refer to *S3AM-313-ATT5 Plants of Concern* for information on locations where some of these poisonous plants are found in the U.S.

- Of the toxic plants in the cashew family, poison ivy (*Rhus radicans*) is most widespread. It grows in a variety of forms such as a low sprawling shrub, dense ground cover, or a thick woody vine that grows high into the tree canopy. Poison oak (*Rhus diversiloba*) is typically a low shrub in drier soils. Both of these plants have leaves of three and white berries. Poison sumac (*Rhus vernix*) is a tall shrub that is less prolific in distribution. It grows in wet areas, has a compound leaf with a red leaf stem (rachis), and white berries. All of these plants possess urushiol oils in all parts of the plant. Touching the plant causes an itchy skin rash that can show up within 4-72 hours following contact. People have a wide range of reactions including swelling, itching, rash and bumps, patches or blisters.
- Uroshiol oil can also transfer onto clothing and equipment. The oil can remain active on surfaces for up to 5 years and can be transferred to your skin.

² Phytodermatosis producer: keep skin covered and wash well after exposure

- Wild parsnip is found throughout the U.S. and contains a poison that produces a rash similar to poison oak and ivy. Unlike poison oak and ivy, the active oil will not be present on unbroken leaves. See *S3AM-313-ATT6 Wild Parsnip Identification* for additional information and photos of wild parsnip.
 - Several plants in the carrot family contain toxic sap that causes severe dermatitis if it comes into contact with skin that is then exposed to sunlight. The most serious reaction is caused by the giant hogweed (*Heracleum mantegazzianum*), a plant that is spreading in southern Ontario and is also present in southwestern British Columbia. The plant is enormous, attaining up to 16 feet (5 meters) in height, which it does in one growing season. Contact causes painful blistering that can cause permanent disfigurement. It is to be avoided. Similar but less serious reactions can be caused by meadow parsnip (*Pastinaca sativa*) and cow parsnip (*Heracleum lanatum*). Meadow parsnip can be very abundant on disturbed sites.
 - Nettles, particularly stinging nettle (*Urtica dioica*) and wood nettle (*Laportea canadensis*) contain urticating hairs on the leaves and stems that cause sharp pain or itchiness on contact with skin. The irritation is immediate and normally lasts no more than an hour and there are no lasting consequences.
 - Some plants contain abundant stiff spines that can present a safety hazard, particularly if one is to fall into them. These include the cactus (*Opuntia spp.*), devils club (*Oplomanax horridum*), and prickly-ash (*Zanthoxylon americanum*).
- 4.8.3 A large number of plants are not harmful to touch but may contain poisonous berries or foliage that could cause serious complications or death if they are ingested. It goes without saying to not eat any berries or plants if you are unsure of their identity.
- Remember that in the fall and winter the hazard still exists in the form of stubble and roots.
- 4.8.4 Personal Protective Equipment (PPE)
- Employees conducting clearing, grubbing, or similarly disturbing work activities in areas where poisonous plants exist shall wear long-sleeve clothing or Tyvek® coveralls, and disposable cotton, leather or synthetic gloves. Employees shall not touch exposed skin (neck and face) with potentially contaminated gloves. Tyvek® and gloves worn to protect from exposure to poisonous plants shall be treated as contaminated, removed from the body in a manner that the contamination is not spread, and placed in plastic bags for disposal.
 - Personal clothing that has been exposed to poisonous plants shall be decontaminated with a poisonous plant cleanser such as Tecnu® or removed in a careful manner, bagged and washed separately from other clothing to remove urushiol.
 - Work boots will be decontaminated with either soap and water or a cleansing agent such as Tecnu® cleanser.
 - If foliage is being cleared and includes poisonous plants, exposed skin shall be treated with a dermal barrier cream such as Tecnu®'s Oak 'n Ivy Armor or Enviroderm's Ivy Block and either a full-face respirator or a half-face respirator (with goggles) fitted with a P-100 (HEPA) dust filter.
- 4.9 Bird Droppings and Biological Soil Hazards
- 4.9.1 Work in any area where pigeons or other flying animals (e.g. bats) may nest requires a written statement from the client which states the potential for, and extent of, accumulation of excrement on/in the structure from pigeons or other winged animals.
- 4.9.2 Substantial accumulations of droppings can pose physical and health risks as slippery surfaces (if wet) and if the material is disturbed and becomes airborne, it can be inhaled or ingested if personal hygiene practices are not implemented. Inhalation of airborne droppings can cause diseases such as histoplasmosis. Exposure to surfaces with bird droppings shall be safeguarded by implementing proper work practices, training employees for awareness and using PPE. See *S3AM-313-ATT8 Bird Droppings*.

4.9.3 Tularemia is a problem with contaminated soil in some locations. Tularemia is a disease of animals and humans caused by the bacterium *Francisella tularensis*. Rabbits, hares, and rodents are especially susceptible and often die in large numbers during outbreaks. Workers can contract Tularemia through tick and deer fly bites, but also through inhalation of contaminated aerosols or agricultural dusts. Check work areas for carcasses before disturbing the ground (e.g. mowing, brushing, grubbing, excavation, etc.).

4.10 Personal Hygiene and Body Checks

4.10.1 Tick-borne diseases typically require that the tick be imbedded for four hours to begin disease transfer. The oils from poisonous plants can take up to 4 hours after exposure to penetrate the skin and react with the live proteins under the skin.

4.10.2 It is recommended that exposed skin be checked frequently for the presence of ticks, insects, rashes, or discolorations. External clothing should also be checked for the presence of ticks and insects; these should be retained for identification and to determine if medical treatment is needed.

4.10.3 Employees shall shower as soon as practical after working in the field and examine their bodies for the presence of ticks, insect bites, rashes, or swollen areas. If imbedded ticks are found, they should be removed using the technique described in *S3AM-313-ATT2 Ticks*.

4.11 Employees shall immediately notify their Manager or Supervisor of the presence of an imbedded tick, bee, wasp or hornet sting, other insect bite, rash, or any abnormal reaction. Reporting shall occur within 4 hours for a significant incident and 24 hours for all other SH&E incidents, and in accordance with *S3AM-004-PR Incident Reporting, Notifications & Investigation*.

4.12 The Manager or Supervisor shall forward the report to the SH&E Manager for follow up.

5.0 Records

None

6.0 Attachments

6.1 [S3AM-313-ATT1 Biological Hazard Assessment Flow Chart](#)

6.2 [S3AM-313-ATT2 Ticks](#)

6.3 [S3AM-313-ATT3 Poisonous Spider Identification](#)

6.4 [S3AM-313-ATT4 Mosquito Borne Diseases](#)

6.5 [S3AM-313-ATT5 Plants of Concern](#)

6.6 [S3AM-313-ATT6 Wild Parsnip Identification](#)

6.7 [S3AM-313-ATT7 Alligators](#)

6.8 [S3AM-313-ATT8 Bird Droppings](#)

6.9 [S3AM-313-ATT9 Large Carnivores & Ungulates](#)

6.10 [S3AM-313-ATT10 Bear Safety](#)

6.11 [S3AM-313-ATT11 Small Mammals](#)

6.12 [S3AM-313-ATT12 Snakes & Scorpions](#)

Americas

Drilling, Boring & Direct Push Probing

S3AM-321-PR1

1.0 Purpose and Scope

- 1.1 This document provides procedures designed to help prevent injuries to personnel working on the project and pedestrians, property damage, and adverse environmental impact as a result of potential hazards associated with drilling, boring and direct-push probing. These hazards include, but are not limited to, encountering underground utilities, subsurface installations, rotating equipment and potential overhead hazards.
- 1.2 This procedure provides the minimum requirements to be followed when drilling, boring, and probing work are performed.
- 1.3 This procedure applies to all Americas-based employees and operations and any other entity and its personnel contractually required to comply with this document's content.
- 1.4 The Manager is responsible for meeting all the requirements in this procedure.
- 1.5 AECOM's clients may have specific procedures which shall be followed to identify and map utility and subsurface structures on their properties or facilities. Provided the client's procedures meet or exceed those of AECOM, approval shall be obtained from the Manager and the SH&E Manager to follow the client's procedures.

2.0 Terms and Definitions

- 2.1 **Underground Utilities** – All utility systems located beneath grade level, including, but not limited to, gas, electrical, water, compressed air, sewage, signaling, and communications, etc.
- 2.2 **Ground Disturbance (GD)** – Any indentation, interruption, intrusion, excavation, construction, or other activity in the earth's surface as a result of work that results in the penetration of the ground.
- 2.3 **Intrusive Activities** – Examples: Excavation of soil borings, installations of monitoring wells, installation of soil gas sampling probes, excavation of test pits / trenches or other man-made cuts, cavity, trench, or depression in an earth surface formed by earth removal.
- 2.4 **Subsurface Installations** – Examples: Subterranean tunnels, underground parking garages, and other structures beneath the surface.

3.0 References

- 3.1 S3AM-003-PR1 SH&E Training
- 3.2 S3AM-118-PR1 Hearing Conservation
- 3.3 S3AM-208-PR1 Personal Protection Equipment
- 3.4 S3AM-209-PR1 Risk Assessment & Management
- 3.5 S3AM-213-PR1 Subcontractor Management
- 3.6 S3AM-305-PR1 Hand & Power Tools
- 3.7 S3AM-306-PR1 Highway and Road Work
- 3.8 S3AM-322-PR1 Overhead Lines
- 3.9 S3AM-322-FM1 Overhead Electrical Lines Acknowledgement
- 3.10 S3AM-325-PR1 Lockout Tagout
- 3.11 S3AM-326-PR1 Machine Guarding
- 3.12 S3AM-331-PR1 Underground Utilities

Drilling, Boring, & Direct Push Probing (S3AM-321-PR1)
Revision 2 July 31, 2019

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Page 1 of 12

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3.13 S3AM-331-FM1 Underground Utilities & Subsurface Installation Clearance Checklist

4.0 Procedure

4.1 Roles and Responsibilities

4.1.1 Manager

- Confirm the development of the project SH&E Plan and compliance with this procedure.
- Confirm the appropriate equipment and materials are available to conduct the drilling, boring or direct-push operations.
- Confirm compliance with *S3AM-331-PR1 Underground Utilities*.
- Review the *S3AM-331-FM1 Underground Utilities & Subsurface Installation Clearance Checklist* prior to authorizing work to proceed.
- Confirm that employees conducting drilling, boring or direct-push probing possess any required training, registrations or certifications.
- Confirm all employees involved and affected by the task review the SH&E Plan, *S3AM-331-FM1 Underground Utilities & Subsurface Installation Clearance Checklist* and Task Hazard Assessment (THA) prior to work commencing.
- Confirm an equipment maintenance inventory is maintained, schedules adhered to and appropriate inspections of equipment are conducted.
- Provide authorization (with the concurrence of the Site Supervisor and SH&E Manager) for work to resume if interrupted due to unexpected conditions or events.

4.1.2 Safety, Health & Environment (SH&E) Manager

- Assist AECOM management as needed by providing guidance and clarification as to issues that may arise.
- Review the project SH&E Plan to confirm compliance with jurisdictional regulations. Provide technical guidance as needed when a variance is pursued related to this procedure. Confirm variance process meets requirements identified in *S2-001-SM1 Global SH&E Management System Manual*.

4.1.3 Employees

- Maintain training as appropriate to the work to be completed (e.g., ground disturbance, lockout tagout, equipment operation, etc.). Refer to *S3AM-003-PR1 SH&E Training*.
- Review the SH&E Plan, *S3AM-331-FM1 Underground Utilities & Subsurface Installation Clearance Checklist* and Task Hazard Assessment (THA) prior to work commencing.
- As appropriate to the anticipated or encountered hazards and as addressed in the applicable planning documentation, utilize appropriate personal protective equipment (PPE) and applicable training, practices and operating procedures.
- Immediately notify the Manager of any unanticipated conditions or events. If assigned equipment, perform appropriate inspections and confirmations of maintenance and / or repairs.

4.2 Training

4.2.1 All on-site employees involved with drilling, boring, and direct-push probing shall be trained, at a minimum, in these procedures and in the procedures of *S3AM-331-PR1 Underground Utilities*.

4.2.2 All operators and assistants shall have the appropriate safety training based on the SH&E Training Matrix and any additional training assessments developed at the business group, and be versed in the equipment to be utilized.

- Refer to *S3AM-003-PR1 SH&E Training*.

- This training may include, but is not limited to, Excavation / Trenching (Ground Disturbance), HAZWOPER, Petroleum Safety Training (or Construction Safety Training), and H2S Alive as appropriate.
 - Only qualified personnel shall operate and inspect equipment.
- 4.2.3 All on-site Employees involved with drilling, boring, and direct-push probing activities shall be provided with on-site orientation of the drill rig and its operation.
- 4.2.4 All Employees involved with drilling, boring and direct-push probing activities at a client site shall receive the applicable client-required training.
- 4.3 Planning
- 4.3.1 SH&E Plan – At a minimum, a SH&E plan that includes a pre-job hazard assessment shall be prepared and communicated to all involved personnel prior to any drilling, boring, and direct-push probing activities. Refer to *S3AM-209-PR1 Risk Assessment & Management*.
- Assessment shall include both overhead and subsurface utilities and installations. Refer to *S3AM-322-PR1 Overhead Lines* and *S3AM-331-PR1 Underground Utilities*.
 - The SH&E Plan will address any required environmental monitoring including gas monitoring, dust, noise, metals, radiation or other monitoring as may be appropriate for site conditions.
 - All SH&E Plan requirements will be followed by the project team.
 - The location specific emergency response plan shall be in place, contain procedures applicable to the potential emergencies presented by the operations, and be reviewed with all personnel potentially affected.
- 4.3.2 A Task Hazard Assessment (THA) shall be completed before every assigned task at the work location. The focus of the analysis shall be on the specific assigned task and the evaluation of risks and assignment of control measures based on actual work conditions.
- 4.3.3 *S3AM-321- ATT2 Pre-Drilling, Boring & Direct-Push Probing Flow Chart* summarizes the key Pre-Drilling, Boring, and Direct-push probing requirements addressed in this procedure.
- 4.3.4 Procedures and documentation as detailed in *S3AM-322-PR1 Overhead Lines* and *S3AM-331-PR1 Underground Utilities* shall be completed prior to any intrusive subsurface work.
- The locations of subsurface and overhead utilities and subsurface installations will be investigated, documented, mapped on a site plan and evidenced with appropriate surface markings.
 - A site walk shall be conducted by the project team / site Manager and any other appropriate personnel, with the objectives of reviewing all planned intrusive activity locations, the locations of subsurface and overhead utilities and the potential for subsurface installations, to determine the appropriate utility clearance activities, and to observe other physical hazards.
 - All proposed subsurface activities will be reviewed in comparison to subsurface and overhead utilities and subsurface installations and adjustments made as necessary.
 - Appropriate clearance activities shall confirm location(s) of identified underground utilities and subsurface structures. Review the applicable completed *S3AM-331-FM1 Underground Utilities & Subsurface Installation Clearance Checklist*.
 - Site Walks should be repeated as necessary following the clearance of subsurface utilities and installations to confirm hazards are clearly identified.
- 4.3.5 Confirm drilling location(s) and / or bore entry and bore exit points are adequately identified on the worksite to enable appropriate equipment positioning.
- 4.4 Permits, Notifications and Access Agreements

- 4.4.1 Any required notifications shall be provided within the appropriate timeframe to the applicable organization (e.g. owner, agency, governing body, etc.).
- 4.4.2 All applicable permits (e.g. client, government, working near rail road, etc.) will be identified, obtained, and adhered to.
- 4.4.3 Access agreements will be obtained and adhered to as necessary.
- 4.5 Pre-Qualifying and Re-Qualifying Drilling Subcontractors
 - 4.5.1 All drilling subcontractors will be properly pre-qualified in accordance with *S3AM-213-PR1 Subcontractor Management*.
 - 4.5.2 The qualifications of the drilling crew performing the work will be evaluated prior to each mobilization and each day by AECOM's on-site representative to assure that their safety performance, training, qualifications, equipment, processes, and approaches reflect AECOM standards for excellence.
 - 4.5.3 All drilling subcontractor equipment will be properly maintained and properly equipped, and the drilling subcontractor will verify their equipment is fully functional as a normal part of their daily and pre-work routine. Refer to *S3AM-321-FM1 Daily Drilling, Boring & Direct Push Equipment Inspection*.
- 4.6 General Health and Safety
 - 4.6.1 Personal Protective Equipment – Refer to the *S3AM-208-PR1 Personal Protection Equipment* for best practices. These requirements may be modified or expanded in the SH&E Plan. Clothing shall be close fitting and comfortable without loose ends, straps, draw strings, belts, or otherwise unfastened parts that might catch on some rotating or translating component of the rig.
 - Depending upon the hazards present, additional PPE may be required such as fire retardant clothing, specific hearing protection, respiratory protective equipment and chemical protective clothing.
 - If the location has potential for underground electrical utilities to be present, workers shall ensure footwear has additional protection of shock resistant soles required (white rectangle with omega symbol).
 - 4.6.2 Hearing Conservation – Hearing conservation program requirements may apply when working around operating equipment. Refer to *S3AM-118-PR1 Hearing Conservation*.
 - Each worker shall wear noise-reducing ear protectors around operating equipment or during elevated noise levels. Distance from the elevated noise level is the primary measure of control for non-essential drilling personnel.
- 4.7 Drilling, Boring and Direct Push Equipment Maintenance and Inspections
 - 4.7.1 All equipment will be inspected prior to the initiation of operations and daily during operations using the *S3AM-321-FM1 Daily Drilling, Boring & Direct-Push Equipment Inspection*. This inspection is the responsibility of the operator who will provide written documentation of the inspection prior to the start of drilling each day.
 - Equipment that is deemed defective will immediately be repaired by a qualified person, or, if repair is not practicable, tagged "Out of Service" and sent for repairs or discarded.
 - 4.7.2 Managers shall confirm an accurate inventory of the equipment within their operation requiring scheduled maintenance is developed. Using applicable regulations, industry standards, best practices, and manufacturer's recommendations, a maintenance schedule shall be developed with defined responsibility, required actions, and frequency. Refer to *S3AM-321-FM2 Drilling, Boring, & Direct-Push Equipment Maintenance Inventory*.
 - 4.7.3 The maintenance program for equipment shall:

- Adhere to applicable regulations, standards, and manufacturers' specifications;
 - Provide for service by appropriately qualified maintenance personnel; and,
 - Require maintenance schedules and records of maintenance.
- 4.7.4 Employees or operators who are assigned equipment are required to review maintenance schedules for that equipment and will confirm that required maintenance has occurred or see that it is undertaken.
- 4.8 General Requirements
- 4.8.1 Excluding geoprobe activities, set up any sample tables and general work areas for employees at a safe distance from the rig.
- The recommended safe distance is the height of the fully extended mast plus 5 feet (1.5 meters), and no less than 30 feet (9.1 meters) from the rig.
 - An increase to this distance may be required due to noise exposure hazards. Refer to *S3AM-118-PR1Hearing Conservation*.
- 4.8.2 Operation of the drilling, boring or direct-push equipment shall be restricted to the designated operator except to activate the emergency shut-off as required.
- All rotary drilling equipment shall have an emergency shut off / kill switch. The location of the switch and operation should be reviewed with all involved Employees.
- 4.8.3 Sit-on direct push rigs are not permitted on AECOM worksites unless the rig has been modified (in accordance with manufacturer's requirements) to be operated by remote control or the rig has been manufactured with a rollover protection system and seat belt.
- 4.8.4 Consult jurisdictional regulations as use of J-hooks and cat-heads may be prohibited. Examples:
- 29 CFR 1926 requires derricks and cranes to use hooks with self-closing latches and permits the use of J-hooks only for a task unrelated to this procedure (setting trusses).
 - British Columbia and Saskatchewan prohibit the use of friction cat-heads.
- 4.9 Identifying the Work Area
- 4.9.1 Ensure the work area is adequately identified:
- Including zone around the drilling, boring, or direct push equipment, as well as fluid equipment, entry point, exit point and any excavated areas.
 - Utilize barricades, signage, pylons, snow fence, etc. as appropriate.
 - Implement traffic control as necessary.
 - Coordinate with concurrent operations to identify their associated hazards and controls, and communicate those associated with AECOM tasks.
- 4.9.2 When operating near public vehicular and pedestrian traffic, the on-site personnel shall take every precaution necessary to see that the work zone is properly established, identified, and isolated from both moving traffic and passer-by pedestrians (refer to *S3AM-306-PR1 Highway and Road Work*).
- 4.9.3 All traffic control devices shall be installed, placed, and maintained in accordance with a Traffic Control Plan, client specifications, and / or the Manual of Uniform Traffic Control Devices and Manual of Uniform Traffic Control Devices for Canada in Canada. Traffic control devices shall consist of and not be limited to
- Directional and informational signage;
 - High visibility barricades, cones, or barrels;
 - Lighting; and
 - Other equipment and devices as required.
- 4.10 Clearing Work Areas

- 4.10.1 In addition to any minimum requirements the drilling subcontractor may have, prior to set up, adequate site clearing and leveling shall be performed to accommodate the rig and supplies and provide a safe working area.
- 4.10.2 Clearing the site includes clearing the intended drilling area obstacles and of underground utilities in accordance with *S3AM-331-PR1 Underground Utilities*.
- 4.10.3 Drilling or probing shall not commence when tree limbs, unstable ground, or site obstructions cause unsafe tool handling conditions.
 - The cleared / levelled area should be large enough to accommodate the rig and supplies.
 - If the rig is positioned on a steep grade and levelling of the ground is impossible or impractical, the wheel of the transport vehicle shall be blocked and other means employed of preventing the rig from moving or toppling over.
- 4.11 Drilling Activities
 - 4.11.1 Federal / State / Provincial / Territorial regulations that govern drill rig operations and exposed moving parts shall be adhered to.
 - 4.11.2 All applicable client on-site safety procedures shall be understood and adhered to.
 - 4.11.3 Minimum approach distances (MAD) from subsurface and overhead utilities and subsurface installations will be established including 5 feet (1.5 meters) from any subsurface utility, 7 feet (2.1 meters) from the pad surrounding any underground storage tanks, and 10 feet (3 meters) from any overhead energized electrical line (or further depending on line voltage). These approach distances are a minimum; government regulations and utility requirements may dictate a greater set back distance and should be confirmed.
 - 4.11.4 Verify that equipment / energy is isolated when lockout is required:
 - Refer to operator's manual and *S3AM-325-PR1 Lockout Tagout*.
 - Ensure stop switch is activated.
 - Driller is out of the seat.
 - Test controls to ensure they do not engage.
 - 4.11.5 In addition to any identified minimum requirements (as applicable, client, drilling subcontractor), the following safety measures shall be taken during drilling, boring or probing operations on site:
 - The operator and helper shall be present during all active rig operations.
 - Site personnel shall remain within visual contact of the rig operator.
 - Hard hats, approved safety boots, safety glasses, and hearing protection shall be worn in the work zone (minimum, the radius around the rig equal to the height of the drill rig mast) of a rig.
 - Gas monitoring shall be conducted as appropriate.
 - Hands, feet and other body parts shall be kept away from moving parts, (e.g. hoisted, rotating, pushing, etc.) including augers, drill rods and reamers.
 - When observing drilling, stand upwind of the drill rig to prevent potential exposure to vapors that may be emitted from the borehole.
 - The emergency shut-off switch on the rig shall be identified to site personnel and tested on a daily basis by the operator.
 - Unauthorized personnel shall be kept outside of the established work zone.
 - Rig crew and other worksite personnel shall not use a cell phone while operating the drill rig or other equipment or within the rig work zone.
 - Do not drive the 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 *S3AM-322-PR1 Overhead Lines*.

- Before raising the mast (derrick), all 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 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 shall be first levelled and stabilized with levelling jacks and / or solid cribbing.
 - The drill rig shall be releveled if it settles after initial set up.
 - Lower the mast (derrick) only when the levelling jacks are down, and do not raise the levelling jack pads until the mast (derrick) is lowered completely.
- After the rig has been positioned to begin drilling, all brakes and / or locks shall be set before drilling begins.
- The operator of a rig shall only operate a drill rig from the position of the controls. The rig shall not be in operation if the operator of the rig leaves the area of the controls.
- Throwing or dropping tools shall not be permitted. All tools shall be carefully passed by hand between personnel or a hoist line should be used.
- If it is necessary to operate the rig 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.
 - Air monitoring and, as necessary, noise monitoring shall be conducted.
- Clean mud and grease from boots before mounting a rig 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 rig with exposed flesh. Freezing of moist skin to metal can occur almost instantaneously.
- All unattended bore holes shall be adequately covered or otherwise protected to prevent rig personnel, site visitors, or animals from stepping or falling into the hole. All open bore holes shall be covered, protected, or backfilled adequately and according to Federal / State / Provincial / Territorial or local regulations on completion of the drilling project.
- When using a ladder on a rig, face the ladder and grasp either the side rails or the rungs with both hands while ascending and descending. Always use adequate fall protection and a full body harness when climbing above 6 feet (1.8 meters) 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.

4.12 Drilling Fluid

- 4.12.1 Ensure drilling fluid is appropriate to the soil type and conditions to be encountered to enable smooth drilling.
- 4.12.2 Drilling fluid used in the boring process shall be contained at the entry and, as applicable, exit locations until recycled or removed from the site.
- 4.12.3 Confirm drilling fluid does not enter roadways, streams, municipal storm or sanitary sewer lines, and / or any other drainage system or body of water.
- 4.12.4 Monitor drilling equipment and fluid equipment for any leakage or spills. Confirm appropriate containment is in place and adequate spill response supplies are available.
- 4.12.5 It is important to monitor fluid flow and pressure gauges when drilling with any tooling, but it is essential when drilling with a mud motor (pump placed in the drill string to provide additional power to the bit while drilling).

4.13 Unanticipated Concrete / Debris or Void

- 4.13.1 The presence of subsurface installations and utilities requires special care when obstructions / refusal and voids are encountered and when unexpected absence of soil recovery occurs during

drilling operations. Other indicators of subsurface installations and utilities are the presence of warning tape, pea gravel, sand, non-indigenous material, bentonite, red concrete (indicative of electrical duct banks) and any departure from native soil or backfill.

- 4.13.2 If unanticipated concrete / debris is encountered and / or if a void is encountered, drilling will be immediately discontinued and the Manager notified. Drilling may only proceed with Manager or SH&E Manager approval.

4.14 Use of Manual Slide Hammer

- 4.14.1 The following health and safety procedures should be followed when using a manual slide hammer to install shallow injection points, drive point piezometers, and drill tools:

- Only use a manual slide hammer that either attaches directly to the point / piezometer being driven or that incorporates a cap on the point / piezometer / drill tool that prevents the slide hammer from slipping off the point / piezometer / drill tool.
- Always grasp the manual slide hammer (handles if equipped with handles) with both hands while driving the point / piezometer / drill tool.
- Never allow hands or feet to get between the manual slide hammer and the drive plate or anvil.

4.15 Use of Augers

- 4.15.1 The following general health and safety procedures should be followed when supervising borings with continuous flight hollow-stem augers:

- Never place hands or fingers under the bottom of an auger section when it is being hoisted 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 augers are rotating, 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 a rotating auger. Never use hands or feet to move cuttings away from a rotating 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.
- Loud noises may occur while driving split spoons. At minimum hearing protection shall be worn when driving split spoons.
- When pulling / lifting augers, a clevis pin or other closed device shall be used. Use of J-hooks is prohibited.

4.16 Attaching and Breaking Rods

- 4.16.1 Do not use manual tools (e.g., pipe wrenches) in combination with rotation of the drill stem. Manual tools are not designed for the load, and may break.

- The use of such tools creates a significant impact hazard for those in the work area, because they rotate with the drill stem. Manual tool use in combination with a rotating drill stem to attach or break rods is therefore prohibited.
- Manual tools may be used if the drill stem is isolated / positively disengaged.
- Mechanical means of rod separation that are permitted include:
 - Opposing hydraulic controls.
 - Rod locking devices or machine's power vice.
 - Hydraulic breakout tools.
 - Hydraulic foot clamps.

4.16.2 Rod box changes present severe crushing hazards. Operators shall ensure all crew members are clear of the machine and hoisting equipment while they are changing rod boxes.

4.17 Rotary, Sonic and Core Drilling

4.17.1 In addition to the health and safety procedures identified above, the following general health and safety procedures should be followed when supervising borings with rotary, sonic and core drilling:

- 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.
- 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 hands to clean drilling fluids from drill rods.
- When drill rods are rotating, stay clear of the rotating components of the drill rig. Never reach behind or around a rotating drill rod for any reason.
- Use a long-handled shovel to move cuttings away from the top of the borehole. Never use hands or feet to move cuttings away from the borehole.
- If work shall 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.
- Keep away from area where drill rods are being moved or raised to the rig. Do not stand in the area where a drill rod will fall or slide if it should be dropped.
- Loud noises may occur during drilling. Hearing protection shall be worn.

4.18 Direct-push

4.18.1 The following general health and safety procedures should be followed when supervising drilling borings with direct-push drilling:

- Loud noise may occur during direct-push drilling. Appropriate hearing protection shall be worn.
- When drill rods are hoisted from the hole, they should be cleaned for safe handling with a suitable rod wiper. Do not use hands to clean drilling fluids from drill rods.
- If work shall 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.

4.19 Horizontal Directional Drilling

4.19.1 During surface to surface operations a 16.4' (5 meters) safe zone shall be established and identified at both the entry and exit locations; no personnel are permitted to be within this zone unless the drill is locked out and the operator is out of the seat.

4.19.2 Machine shall be locked out before entering an excavation, changing tools, adding or removing drill stem or doing any other work on tools or the drill stem at the exit end of the bore.

4.19.3 A tracking head shall be installed on the drill stem:

4.19.4 Assemble drill head using components appropriate to the soil conditions to be encountered (e.g. nozzle, bit, beacon housing, etc.).

4.19.5 Ensure all personnel are clear of the bore entry point (outside of identified work zone).

- 4.19.6 At all times two way communication will be maintained at entrance and exit points using two way radios or equally effective communication means. If at any time communication is lost, all work will be stopped until communication is re-established
- 4.19.7 Locate drill head with tracking device at least every half-length of pipe. Adjust direction as necessary to follow the intended bore path.
- 4.19.8 Any drilling fluid returning to the surface shall be cleaned up promptly.
- 4.19.9 Drill pipe should exit the bore at an angle of 5 to 10° from the ground surface.
- 4.19.10 Turn off fluid flow as soon as drill head emerges.
- 4.19.11 Lockout machine and remove drill head using appropriate breakout tools.
- 4.19.12 Select and attach a reamer that allows the return of drilling fluids and cuttings, to reduce frictional pullback forces, and to allow for bend radius of the pipe. Reamer shall be:
 - The smaller of 1.5 times the outside diameter (O.D.) or 12 inches (300mm) larger than the diameter of the product pipe.
 - A diameter less than 1.5 times the diameter of the product may be necessary in collapsing soil formations.
 - Reamed diameter may need to be increased by up to 25% if substantial swelling of the soil is expected to occur.
- 4.19.13 All personnel shall clear the trench or the designated surface zone (16.4 feet [5 meters]) once the reamer is attached. Operator shall only reverse lockout and commence pullback when communication is received from personnel on exit hole side and operator has confirmed the message.
- 4.19.14 Personnel on exit hole side shall ensure reamer is pulled the entire way back to the exit hole.
 - If rotation is started when drill rod and reamer are away from the exit hole, very fast sideways movement of the rod and reamer can occur.
 - Larger reamers and longer lengths of exposed drill rod increase the speed and distance of this movement.
- 4.19.15 If working with trailing drill stem, swivels shall be verified as lubricated and rotating freely by hand prior to use:
 - A freely moving swivel prevents trailing drill stem or product from rotating / whipping.
 - If the swivel does not move freely by hand it shall be removed from service and repaired or replaced.
 - Only use swivels with limited articulation to prevent whipping or cranking action between the reamer and trailing drill pipe or product.
- 4.19.16 It is important to clean and lubricate the tool and drill stem joint threads before each use.
- 4.19.17 Any individual drill pipes that are bent or damaged shall be immediately taken out of service.
- 4.19.18 Occasionally change the order of the lead drill pipe (i.e. move the lead pipe to the end of the stem, or other pipe rotation procedures) to extend drill stem life.
- 4.19.19 Operator should avoid stalling the pipe rotation to avoid stress damage from shock loading.
- 4.20 Drilling at Potential MEC / UXO Sites
 - 4.20.1 If the project site is suspected of containing munitions and explosives of concern (MEC) or unexploded ordnance (UXO), the UXO team will conduct a reconnaissance and MEC / UXO avoidance to provide clear access routes to each site before drilling crews enter the area. The following procedures will be implemented:

- Drilling operations on an MEC / UXO site will not be conducted until a complete plan for the site is prepared and approved by the AECOM UXO Safety Officer. MEC / UXO avoidance shall be conducted during drilling operations on known or suspect MEC / UXO sites.
- The UXO team will identify and distinctly mark the boundaries of a clear approach path for the drilling crews, vehicles, and equipment to enter the site. This path will be, at a minimum, twice the width of the widest vehicle. No personnel will be allowed outside any marked boundary.
- If MEC / UXO is encountered on the ground surface, the UXO team will clearly mark the area where it is found, report it to the proper authorities, and divert the approach path around it.
- The UXO team will conduct an access survey using the appropriate geophysical instrument over the approach path for avoidance of MEC / UXO that may be in the subsurface. If a magnetic anomaly is encountered, it will be assumed to be MEC / UXO, and the approach path will be diverted around the anomaly. UXO personnel only will operate the appropriate geophysical instrument and identify MEC / UXO.
- An incremental geophysical survey of the drill-hole location(s) will be initially accomplished by the UXO team using a hand auger to install a pilot hole. If MEC / UXO is encountered or an anomaly cannot be positively identified as inert material, Hazardous, Toxic, and Radioactive Waste (HTRW) sampling personnel will select a new drill-hole location.
- Once the surface of a drilling site has been cleared and a pilot hole established as described above, the drilling contractor will be notified that the site is available for subsurface drilling.

4.21 Movement and Transport of Drilling, Boring or Direct-Push Equipment

- 4.21.1 Personnel transporting equipment shall be properly licensed and shall operate the vehicle according to Federal / State / Provincial / Territorial, and local regulations. Refer to *S3AM-005-PR1 Driving* and *S3AM-320-PR1 Commercial Motor Vehicles*.
- 4.21.2 Confirm the traveling height (overhead clearance), width, length and weight of the equipment with the carrier. Identify highway and bridge load, width and overhead limits, to confirm these limits are not exceeded and with adequate margin.
- 4.21.3 Allow for overhang of any drilling, boring or direct-push equipment when cornering or approaching other vehicles or structures.
- 4.21.4 Be aware that the canopies of service stations and motels are often too low for equipment loaded on a trailer to clear
- 4.21.5 Watch for low hanging electrical lines, particularly at the entrances to drilling sites or restaurants, motels, other commercial sites.
- 4.21.6 Never travel on a street, road, or highway with any part of the drilling, boring or direct-push equipment in a raised or partially raised position.
- 4.21.7 Remove all ignition keys if rig is left unattended unless client requirements specify that the keys remain in the ignition switch at all times.
- 4.21.8 Before moving a rig on location, the operator shall do the following:
 - To the extent practical, walk the planned route of travel and inspect it for depressions, gullies, ruts, and other obstacles.
 - Check the brakes of the truck / carrier, especially if the terrain along the route of travel is rough or sloped.
 - Discharge all passengers before moving on rough or steep terrain.
- 4.21.9 Engage the front axle (on 4x4, 6x6, etc., vehicles) before traversing rough or steep terrain
- 4.21.10 Driving drill rigs along the sides of hills or embankments should be avoided; however, if side-hill travel becomes necessary, the operator shall conservatively evaluate the ability of the rig to remain upright while on the hill or embankment. The possibility shall be considered that the presence of

drilling tools on the rig may reduce the ability of the rig to remain upright (raises the center of mass of the rig).

- 4.21.11 Logs, ditches, road curbs, and other long and horizontal obstacles should be approached and driven over squarely, not at an angle.
- 4.21.12 When close lateral or overhead clearance is encountered, or when backing up, the driver of the rig shall be guided by another person on the ground.
- 4.21.13 Loads on the drill rig and truck shall be properly stored while the truck is moving, and the mast shall be in the fully lowered position.

4.22 Loading and Unloading

- 4.22.1 Consult applicable manufacturer's recommendations for loading and unloading of the equipment.
- 4.22.2 Use ramps of adequate design that are solid and substantial enough to bear the weight of the rig with carrier, including tools.
- 4.22.3 Load and unload on level ground.
- 4.22.4 Use the assistance of someone on the ground as a guide.
- 4.22.5 Check the brakes on the rig carrier before approaching loading ramps.
- 4.22.6 Distribute the weight of the rig, carrier, and tools on the trailer so that the center of weight is approximately on the centerline of the trailer and so that some of the trailer load is transferred to the height of the pulling vehicle. Refer to the trailer manufacturer's weight distribution recommendations.
- 4.22.7 The rig and tools should be secured to the hauling vehicle with ties, chains, and / or load binders of adequate capacity.

5.0 Records

- 5.1 All employee training files shall be maintained in accordance with *S3AM-003PR1 SH&E Training*.
- 5.2 Completed inspections and maintenance inventories shall be maintained the site or project files.

6.0 Attachments

- 6.1 [S3AM-321-ATT1 Core Drilling Machine](#)
- 6.2 [S3AM-321-ATT2 Pre-Drilling, Boring, & Direct-Push Probing Flow Chart](#)
- 6.3 [S3AM-321-FM1 Daily Drilling, Boring & Direct-Push Equipment Inspection](#)
- 6.4 [S3AM-321-FM2 Drilling, Boring & Direct-Push Equipment Maintenance Inventory](#)

**Appendix F:
AECOM's Global SH&E Management System Manual
(included in field copy;
excluded from reviewer copy)**

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AECOM

Built to deliver a better world

SAFETY FOR LIFE



Global Safety, Health & Environment Management System Manual

August 20, 2020
SH&E Document S2-001-SM1
Revision 6



Table of Contents

1. Purpose and Scope.....	1
2. SH&E Management System.....	2
2.1 SH&E Management System Description.....	2
2.2 SH&E Management System Integration & Implementation.....	2
2.3 SH&E Management System Documentation Structure.....	2
2.4 Monitoring, Assessment and Corrective Actions.....	3
2.4.1 Assessment, Audit and Inspection.....	4
2.4.2 Monitoring.....	4
2.4.3 Corrective and Preventive Action.....	5
2.4.4 Management Review.....	6
2.5 Document Control and Retention.....	6
2.5.1 Location of Documents.....	6
2.5.2 Review and Approval.....	6
2.5.3 Records Management & Retention.....	7
3. Attachments.....	8
3.1 S2-001-ATT1 Life Preserving Principles.....	8
3.2 S2-001-ATT2 Terms & Definitions.....	8
3.3 S2-001-ATT3 Minimum Global Safety, Health & Environmental Requirements.....	8
3.4 S2-001-ATT4 SH&E High-Risk Events Guidance.....	8
4. Change Log.....	8

AECOM Global

Safety, Health & Environment Management System Manual

S2-001-SM1

1. Purpose and Scope

AECOM is committed to exceptional levels of performance in safeguarding our employees, subcontractors, the public and the environment. As an expression of this commitment, AECOM's *Safety for Life* program includes a Global Safety, Health, and Environment (SH&E) Management System that sets out the policies, expectations, and commitments for AECOM. The AECOM Global SH&E Management System, guided by our Life-Preserving Principles, enables employees, subcontractors and clients of AECOM to fully understand, and themselves commit to safety, health and environmental excellence. We foster a Culture of Caring that expects our employees, contractors and business partners to take responsibility for their own safety as well as for colleagues and others associated with our work.

This Manual describes AECOM's Global SH&E Management System and documents the policies, process, and procedures for the systematic and uniform approach to regulatory compliance, managing SH&E risks and opportunities, and to continual improvement. This Manual also specifies how AECOM documents, implements, monitors and maintains our Global SH&E Management System consistent with AECOM's Integrated Management System.

Contained within this Global SH&E Management System Manual are descriptions of our supporting global SH&E requirements. These global requirements define minimum SH&E requirements in a wide range of areas reflecting the nature of our activities. The AECOM SH&E Management System is made accessible to AECOM employees through our company intranet, and is available upon request by external parties, such as clients or employee representatives.

The scope of the SH&E Management System covers AECOM operations worldwide. The scope of the SH&E Management System is defined as the combined areas of direct control and influence in AECOM and includes:

- All SH&E issues under AECOM direct control (e.g., direct hires [including those in staff augmentation contracts], subcontractors under direct AECOM supervision, populated joint ventures where AECOM is the managing partner, etc.).
- External SH&E issues where AECOM exerts indirect management control including activities, products and services of suppliers, contractors, subcontractors and clients.
- Monitoring of AECOM's SH&E performance to confirm that AECOM's activities are compliant with the processes and requirements outlined in this Manual and that the health and safety of AECOM employees, other stakeholders, and the natural environment are being duly respected.

The scope of the SH&E Management System covers all activities including shared / sole occupation of client premises managed by AECOM, except when:

- Seconding staff to other organizations.
- Working as part of a Joint Venture / Project Consortia where a third party has developed a project-specific SH&E Management System, and AECOM has agreed to the third party system (AECOM is not the managing partner).

In these situations we may contribute to and work under another party's SH&E Management System but will not have overall responsibility for its implementation. However the company recognizes that in these situations a duty of care is still owed to our employees and preference, where possible, is that the AECOM SH&E Management System is utilized.



2. SH&E Management System

2.1 SH&E Management System Description

The AECOM Global SH&E Management System is based on the requirements of internationally recognized standards for SH&E ; BS OHSAS 18001 (Occupational Health and Safety Management Systems), ISO 45001 (Occupational Health and Safety Management Systems), ISO 14001 (Environmental Management Systems), and ANSI Z10-2012 (Occupational Health and Safety Management Systems). Meeting the requirements of these standards demonstrates to our clients that we have a robust, high quality SH&E Management System.

In many locations, our system has achieved third party certification, which is awarded following an independent assessment. While the scope of the system applies throughout the world, not all locations currently hold third party certification to ISO / OHSAS standards. These locations are still required to follow the fundamental principles of the SH&E Management System detailed in this document and those policies and procedures specific to their geographies. Our third party certified locations are highlighted on the appropriate certificates.

2.2 SH&E Management System Integration & Implementation

The corporate structure for the competent and effective delivery of AECOM's SH&E Management System is illustrated in the organization chart on the company intranet. The Chairman & Chief Executive Officer (CEO) has overall responsibility for SH&E within the company. The CEO delegates the day-to-day duties to the super-geography and Business Group Presidents who confirm SH&E policy, strategies and objectives are implemented and embedded into their businesses. SH&E Teams, established in each country or region, are led by the Vice Presidents of SH&E, which are responsible for functional SH&E matters, system development and providing advice and guidance as needed. There may be local variations of this structure in some locations, with local specific procedures providing clarification.

While active participation in AECOM's *Safety for Life* program is a responsibility and expectation of all AECOM personnel, Project Managers (this may include Location, Office, Operations or Program Managers / Directors), shall have the overall responsibility for implementation of the SH&E Management System on their respective project sites and offices. SH&E Management System activities shall be integrated throughout the project's lifecycle; from pre-bid and start-up, through execution and close-out. The main SH&E roles and responsibilities of key project personnel and their staff shall be outlined in the associated SH&E Plan. SH&E representatives shall act in an advisory capacity within their area of expertise to assist in proper planning, implementation, monitoring and continual improvement of the SH&E Management System and to promote the AECOM *Safety for Life* program.

2.3 SH&E Management System Documentation Structure

AECOM's Safety Health & Environment (SH&E) Management System documentation, includes:

- The Global SH&E Policy (S1) – confirms AECOM's commitment to safeguarding our people, projects and reputation by striving for zero employee injuries and illnesses, avoiding property damage and by operating and delivering our work responsibly and sustainably.
- The Global SH&E Management System Manual (S2) – describes how AECOM documents, implements, monitors and maintains our Global SH&E Management System and provides minimum global requirements.
- Procedures, instructions and forms – provide requirements and guidance additional to the minimum global requirements, specific to the super-geographies (S3 - Americas, Asia-Pacific [APAC], Europe, Middle East & Africa [EMEA]) and as necessary to the Business Group or specific country / region (S4).

SH&E Management System documentation is made readily available to AECOM personnel through the company's intranet. The documentation is also provided to employees and further supplemented through location or project specific SH&E Plans (equivalent terms may be used such as, Health and Safety Plan [HASP], Safe Work Method Statement [SWMS], SH&E Management Plan (SHEMP), etc.). Further supplementation found in location or project specific SH&E Plans includes:

- Descriptions of roles and responsibilities applicable to the location or project.

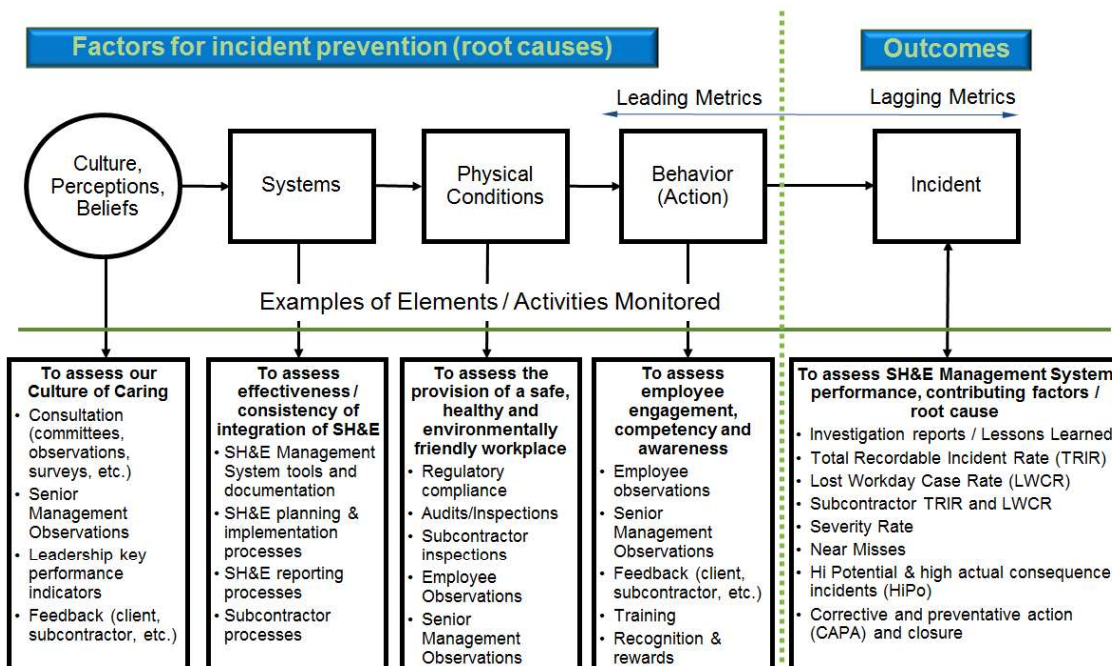


- Completed risk registers / hazard assessments for each task and operation found in the work scope.
- Supplementary information to the provided AECOM procedures that is specific to the location or project (e.g., incident reporting / notification, jurisdiction-specific regulatory requirements, client requirements, medical surveillance requirements, monitoring requirements, site access control measures, inspection frequency, etc.).
- Induction / orientation and training requirements.
- Personal protective equipment requirements for the separate tasks or operating areas.
- Location-specific Emergency Response Plan.
- Any additional content and plans necessary to enable safe execution of the scope of work.

If existing documented SH&E Management System requirements or procedural content cannot be complied with and a variance to the procedures or requirements is necessary to conduct an upcoming task, documented approval to vary from procedure or requirement shall be sought from the applicable Vice President (VP) SH&E or designee. Should approval be obtained, the variance to the SH&E Management System requirements or procedure content may be followed for the pending task specific to the project only, or for such duration as specified by the VP SH&E or designee. Compliance with documented SH&E Management System requirements and procedural content is required for the associated task thereafter.

2.4 Monitoring, Assessment and Corrective Actions

Assessment of the implementation and effectiveness of the SH&E Management System is to be conducted to identify strengths and opportunities. These inform our continual improvement process, objectives, and targets. Assessment activities are driven by our incident prevention model, and may include, but not be limited to, consultation and review of observations and feedback (employee, client, subcontractor, safety committees, etc.), inspections and audits, investigations, project closure reviews, etc.



In addition to guiding assessment activities, AECOM's Incident Prevention Model serves as a framework to ensure that our key performance indicators, known as our Core Value Metrics (CVMs), are selected to drive the most impactful activity-based behaviors at each level of the organization. Targets associated with our CVMs are set at the



corporate level, with additional targets set specific to each Business Group and geography. Targets are agreed upon using industry best practices, scope of work risk assessment, and heightened standards to track key proactive behaviors on a monthly basis and drive our goals of incident prevention and continual improvement.

2.4.1 Assessment, Audit and Inspection

Internal or self-assessment audits and inspections are performed to monitor compliance with the SH&E Management System. Audit schedules shall be established in AECOM locations, including worksites and/or offices, where required by AECOM, its clients, or local legislation. Training of auditors shall be applicable to the audit conducted. The terms of reference for auditors are to:

- Determine and record compliance with the requirements of the Management System and associated International Standards; including OHSAS 18001, ISO 45001, and ISO 14001.
- Identify areas of non-compliance, agree on corrective action with the responsible employees and record this in the relevant corrective action tracking tool.
- Identify opportunities for continual improvement.
- Identify opportunities for improvement in business efficiency.
- Provide input to the Management Review.
- Raise awareness of the Management System.
- Identify trends as a baseline for improvement.

The company's activities at sites and facilities are also monitored through workplace inspections. These inspections will be arranged as required by the Project Manager. At a minimum, workplace inspections will be performed monthly and may be performed more frequently as required by local regulations or Business Group requirements and stated in the SH&E Plan. Workplace inspections are also supplemented by Senior Management activities providing visible involvement, interest and support.

Project / Program Safety Reviews (PSRs) shall be conducted by SH&E Management to systematically review a project's or program's field activities and the application of AECOM's Safety, Health and Environment Management System. The order of the assessment is in accordance with AECOM's Life Preserving Principles.

- The assessment findings are recorded and scored as detailed within the geography's *Program SH&E Review Assessment* form or the *Project Safety Review* tool within LifeGuard or IndustrySafe. The assessment shall include a summary of findings, corrective actions, and assignment of responsible parties.
- The *Program SH&E Review Assessment* shall be used to complete the geography's *Program SH&E Review Summary* or be summarized within LifeGuard or IndustrySafe. The summary is intended to enable presentation of Project / Program SH&E Review findings and recommendations to program or project management and any other relevant stakeholders.

Senior Management shall complete Senior Management Observations (SMOs) on field sites and in offices by employing observations and conversations with employees to answer questions that are aligned with our Life-Preserving Principles. This activity, as well as senior management walk-throughs, demonstrate management commitment to our SH&E goals, and provides real-time, first-hand information about the application and effectiveness of our SH&E program.

2.4.2 Monitoring

Monitoring of the SH&E Management System implementation and effectiveness is reviewed at corporate, regional and business unit level. SH&E Managers prepare regular SH&E performance reports for their respective management teams. These reports may include details of:

- Incident and near miss reports.



- SH&E performance including data on the Core Value Metrics (CVM) showing actual performance against target (reported and reviewed monthly at a minimum).
- Progress against corporate / group objectives and targets.
- Progress of SH&E initiatives.

Online Reporting Databases – The SH&E Team monitors the contents of IndustrySafe and LifeGuard so that appropriate action can be taken to close out the entries.

IndustrySafe and LifeGuard are also reviewed so that any trends or patterns of behavior which could affect SH&E performance can be identified and appropriate responses developed and implemented.

2.4.3 Corrective and Preventive Action

The SH&E Team shall regularly review reports for evidence of non-conformance, deficiency or risk so that appropriate corrective and preventive action can be taken. This action may include but is not limited to:

- Carrying out an investigation into the circumstances.
 - Analysis of the causes of the non-conformity.
 - Assessment of consequences of occurrence (e.g., direct / indirect costs, project schedule impact, etc.).
 - Preparation of proposed necessary preventive action.
 - Implementation.
 - Review of the effectiveness of the action.
 - Review of risk assessments including any statutory SH&E aspects.
- Identifying opportunities for improvement and innovations.
- Issue of guidance to staff and management.
- Issue of a lessons learned bulletin.
- Review of current policies, training, risk assessments, processes and procedures.
- Review of the implementation of corrective and preventive action's effectiveness.

Corrective and preventive action shall be appropriate to the effects of the potential non-conformity, deficiency or risk. In particular, it shall take into account:

- The effect on the safety and health of employees, subcontractors, the public, and the environment.
- The effect on AECOM's service to the client.
- Exposure of AECOM to technical and / or commercial risk.
- The need to continually improve the Management System.

Corrective and preventive action shall be the responsibility of the VP of SH&E and the SH&E Directors / Managers. Actions shall be entered into IndustrySafe and LifeGuard, and progress will be tracked.

- All corrective and preventive actions with due dates or estimated completion dates in excess of 30 days from the start date shall be reviewed by SH&E Directors / Managers for appropriateness of due date or estimated completion date.
- SH&E Directors / Managers shall coordinate with the corrective action's responsible parties to achieve earlier resolution if due dates or estimated completion dates are deemed unacceptable.
- Corrective and preventive actions that cannot be completed by the due date or estimated completion date shall require review and approval by the applicable VP SH&E.



2.4.4 Management Review

Senior management will review the organization's SH&E Management system at planned intervals (annually as a minimum) to confirm its continuing suitability, adequacy and effectiveness. Reviews will include the assessment of opportunities for improvement and the need for changes to the SH&E Management System, SH&E Policy and SH&E objectives. Records of the management reviews will be retained. Input to management reviews may include:

- Results of internal audits.
- Evaluations of compliance with applicable legal requirements and other requirements to which AECOM subscribes.
- The results of participation and consultation.
- Relevant communication(s) from external interested parties, including complaints.
- The SH&E performance of the organization.
- The extent to which objectives have been met.
- Status of incident investigations.
- Review of significant environmental aspects and impacts.
- Status of corrective actions and preventive actions.
- Follow-up actions from previous management reviews.
- Changing circumstances, including developments in legal and other SH&E requirements.
- Recommendations for improvement.

The outputs from management reviews will be consistent with the organization's commitment to continual improvement and will include any decisions and actions related to possible changes to:

- SH&E performance.
- SH&E policy and objectives.
- Resources.
- Other elements of the SH&E management system.

Relevant outputs from management review will be made available for communication and consultation.

2.5 Document Control and Retention

2.5.1 Location of Documents

Documents in the SH&E Management System can be found on Ecosystem, the company intranet. SH&E Management System documents shall be obtained directly from Ecosystem to ensure the most current version is in use. Documentation that relates to projects will be kept with project files under the control of the Project Manager. Documentation that relates to AECOM locations will be kept in location under control of the Project Manager or designee.

2.5.2 Review and Approval

Documents in the SH&E Management System shall be reviewed periodically as required. Recommendation for new documents, updates or changes to existing documents shall be escalated through the SH&E Management System Change Request Process.

Procedures (S3 documents) shall be reviewed and, where necessary, updated twice yearly. Off-cycle updates or changes may be made in the event of a High Potential or high actual consequence (HiPo) incident or regulatory



change. Subject matter experts shall be consulted as necessary and regulatory requirement reviews conducted at suitable intervals to meet AECOM's SH&E objectives and commitments and to ensure legal compliance. Records of consultations and reviews shall be maintained as appropriate.

Where such updates occur, the VPs of SH&E are responsible for seeking views from a selection of appropriate employees before new processes and procedures are fully implemented. Changes will be approved for issue by the VPs of SH&E. A summary of changes shall be made available and displayed on the company intranet, and employees informed through team briefings, bulletins, emails, notice boards and newsletters, etc. Project-related documents will be reviewed and approved by the Project Manager or other appointed persons as appropriate.

Current versions of the SH&E Management System, Policy and procedures are available on the company intranet. The SH&E Management System, Policy and procedures are controlled documents. Paper copies of the documents may be in circulation but are uncontrolled and shall be checked for accuracy before use. Obsolete documents and data will be removed from all points of issue and use.

2.5.3 Records Management & Retention

Records shall be kept to comply with applicable jurisdictional recordkeeping requirements, in accordance with the *AECOM Records Retention Procedure*, and to demonstrate the SH&E Management System operates effectively and processes have been carried out under safe conditions. Records that shall be kept include but are not limited to:

- Training records (including orientation / induction).
- SH&E inspection reports.
- SH&E audit reports.
- Incident reports.
- Monitoring and testing reports.
- Medical surveillance and fit test records.
- Field logs and records of exposure to substances hazardous to health.
- Maintenance and calibration records.
- Records of emergency response drills.
- Management reviews.
- Risk assessments and SH&E Plans including revisions.
- Client-specific SH&E documentation.
- SH&E related insurance certificates.
- Waste management documents.
- Permits, licenses and vehicle records.

Records will be stored in a safe place, will be readily retrievable, and protected from deterioration. Sensitive data and private personal information will be protected through strict confidentiality measures and restricted access.

Retention periods may be in excess of 50 years (as defined in the AECOM Records Retention Procedure, any further Business Group-specific records retention procedure, or by local legislation) and required approvals shall be sought prior to any disposal of records.



3. Attachments

- 3.1 [S2-001-ATT1 Life Preserving Principles](#)
- 3.2 [S2-001-ATT2 Terms & Definitions](#)
- 3.3 [S2-001-ATT3 Minimum Global Safety, Health & Environmental Requirements](#)
- 3.4 [S2-001-ATT4 SH&E High-Risk Events Guidance](#)
- 3.5 [S2-001-ATT5 Location-Specific Pandemic Planning](#)
- 3.6 [S2-001-ATT6 Potential Coronavirus Exposure Management and Reporting](#)
- 3.7 [S2-001-FM1 Executive Incident Review Template](#)
- 3.8 [S2-001-FM2 Location-Specific Pandemic Plan Template](#)
- 3.9 [S2-001-FM3 Pandemic Planning and Execution Inspection](#)
- 3.10 [S2-001-FM4 Coronavirus Response: Workplace Readiness Checklist](#)

4. Change Log

Rev #	Change Date	Description of Change	Location of Change
1	June 15, 2015	Complete rewrite – integration of URS & AECOM programs	Various locations
2	August 1, 2016	Refer to SH&E Management System Manual Edit Summary – August 2016	Various locations
3	August 1, 2017	Refer to SH&E Management System Manual Edit Summary – August 2017	Various locations
4	January 15, 2019	Rewrite and restructure into 1 manual and 3 attachments (this document as the manual). Refer to SH&E Management System Manual Edit Summary – January 2019	Various locations
5	May 3, 2019	Add S2-001-ATT4 link	Section 3.4
6	August 20, 2020	Added links S2-001-ATT5, S2-001-ATT6, S2-001-FM1, S2-001-FM2, S2-001-FM3, and S2-001-FM4	Section 3.4

Appendix I: Laboratory Accreditation