CASTNET

Quality Assurance Project Plan

Appendix 5: CASTNET Health and Safety Plan

EPA United States Environmental Protection Agency

Clean Air Status and Trends Network

Quality Assurance Project Plan

Revision 10.0

Appendix 5:

CASTNET Health and Safety Plan

May 2023

SITE HEALTH AND SAFETY PLAN (HASP)

Project Name:	**Clean Air Status and Trends Network (CASTNET)**		
Project Location:	**Various locations nationwide**		
Project No.:	**6064226103**	**Task No:**	**Various**

This HASP addresses the health and safety hazards of each task conducted by WSP employees for this project, including the requirements and procedures for worker protection (per HSE-PRO-100262, the WSP Hazardous Waste Operations and Emergency Response Program, and the Integrated Health, Safety, and Environment [HSE] Manual). The HASP was developed based on the hazards known or suspected to be present at each site, specifically as they relate to the work to be conducted by WSP employees. Subcontractors are required to adopt this HASP and are responsible for reviewing and revising/amending the HASP to ensure that it addresses hazards unique to their operations.

The Site Health and Safety Officer (SHSO) can change or amend this document only with agreement from the Group Health, Safety, and Environment Manager. The SHSO must initial any change made to the HASP at the relevant section and document the amendment date below. **This document must be kept on site at every CASTNET site.**

Prepared by: Digitally signed by Marcus O. Stewart Date: 2023.07.07 10:25:03 -04'00' WSP Managing Office: Gainesville, FL

Approved by:

Michael.j.Smith	2023.07.07 10:41:22 -04'00'
Site Health and Safety Officer	Date
Mishoe, Kevin (USKM717639) 2023.10.13 11:23:12 -04'00'	
Field Operations Manager	Date
Digitally signed by Rogers, Christopher (USCR718689) Date: 2023.10.13 11:15:09 -04'00'	
Project Manager	Date
Kirby Lastinger	07/10/2023
Regional HSE Manager	Date

Amendment(s):

All field personnel and site operators are required to read this HASP. SHSO will participate in the readiness review (Section 5.5.3 of QAPP Main Body) that will be held before initiating a work assignment. Similarly, a tailgate meeting will be held before every site calibration

(Appendix B). All applicable sections of this HASP will be reviewed during this briefing. Important safety and health issues concerning tasks will be discussed and documented on the Tailgate Safety Meeting checklist (Appendix B). After reading the HASP and attending a field briefing, field personnel must sign the following acknowledgment statement:

WSP Field Team Review: I acknowledge that I have read the requirements of this HASP and agree to abide by the procedures and limitations specified herein. I also acknowledge that I have been given an opportunity to have my questions answered regarding the HASP and its requirements prior to performing field activities. Health and safety training requirements applicable to my field activities at this site are current and will not expire during on-site activities.

Name	**Date**	**Name**	**Date**

SUBCONTRACTORS

I have provided subcontractors who will be performing field activities on this site with a copy of this Site Health and Safety Plan and have thereby also informed the subcontractors that WSP procedures HSE-PRO-100262, HSE-PRO-100260 and HSE-PRO-100284 (included as Appendices) apply to their field activities.

Project Manager Date

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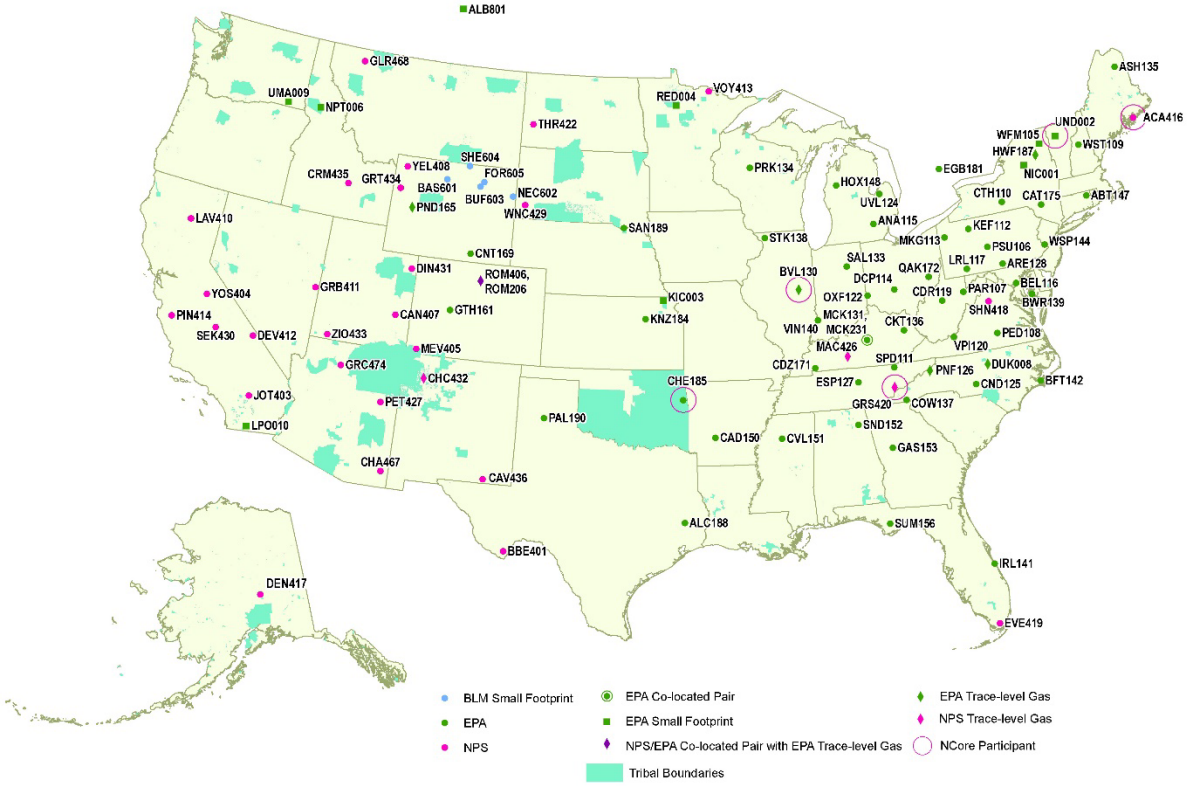
Abbreviations

AHA	Activity Hazard Analyses
HASP	Health and Safety Plan
HSE	Health, Safety & Environment
OSHA	Occupational Safety and Health Administration
PPE	personal protective equipment
RAC	Risk Assessment Code
SCBA	self-contained breathing apparatus
SHSO	Site Health and Safety Officer
WBGT	wet-bulb globe temperature

The Clean Air Status and Trends Network (CASTNET) is a nationwide air quality monitoring network that began operating in 1991. The network provides long-term measurements of air pollutant concentrations in rural areas across the United States to determine compliance with ozone National Ambient Air Quality Standards and to evaluate the effectiveness of national and regional emission control programs. CASTNET is managed and operated by the U.S. Environmental Protection Agency (EPA) in cooperation with the National Park Service (NPS), the Bureau of Land Management (BLM), and other federal, state, tribal, and local partners. In 2022, the network operated 100 monitoring stations throughout the contiguous United States, Alaska, and Canada. Figure 1.1 shows the sites operated during 2022 along with LPO010, CA installed in January 2023.

Figure 1.1 CASTNET Sites



During 2022, all but six CASTNET sites measured weekly ambient concentrations of acidic pollutants, base cations, and chloride (Cl^-) using a 3-stage filter pack with a controlled flow rate. Most CASTNET sites also include a temperature-controlled shelter and continuous O_3 monitoring system. O_3 concentrations were measured at 88 sites. The O_3 inlet and filter pack are located atop a 10-m tower. Figure 1.2 depicts a typical monitoring site. Some CASTNET sites also measure trace-level pollutants and meteorological parameters. Table 1.1 summarizes the monitoring network.

Figure 1.2 Typical CASTNET Monitoring Site

Table 1.1 CASTNET Site Measurements

CASTNET Site Measurements*

- **101 sites**
  98 locations (two sites co-located)
  65 EPA
  31 NPS
  5 BLM
  88 sites measure ozone
  12 sites operate a filter pack only
- **Trace Gas Sites**
  NO_y
  6 EPA
  2 NPS
  NO_x
  1 NPS
  SO_2
  1 EPA
  2 NPS
  CO
  1 EPA
  2 NPS
- **42 Sites with Meteorological Measurements**
  6 EPA sites
  31 NPS sites
  5 BLM sites

*_Individual site histories_ - https://www.epa.gov/castnet/castnet-site-locations

*_Network changes listed in annual reports_ - https://www.epa.gov/castnet/documents-reports

WSP is under contract with EPA to operate 65 EPA-sponsored sites located across the U.S. (green locations in Figure 1.1). Each site is serviced by a local, trained site operator who visits the site every Tuesday and occasionally for repairs. In addition, each site is calibrated every six months by WSP or regional subcontractor personnel.

Special sampling at approximately 35-m is performed at DUK008, NC. This site requires the use of a safety harness to access the upper sampling locations. Trained WSP engineers/technicians service these sites and the Gainesville, FL health and safety officer inspects the harnesses annually. The standard 10-m tower at other sites is tilt-down (Figure 1.2) and requires no climbing to access the sampling.

This HASP, the CASTNET Corporate Health & Safety Program Manual, the requirements and procedures for worker protection (HSE-PRO-100262, Hazard communication), the WSP Hazardous Waste Operations and Emergency Response Program, and the Integrated Health, Safety, and Environment (HSE) Manual constitute CASTNET's site health and safety program. All accidents must be reported to the Health and Safety Officer immediately. The Health and

Safety Officer will then report all accident information to the Project Manager and the CASTNET Health and Safety Manager. Prompt reporting is essential for the prevention of future incidents in addition to the well-being of the affected individual or individuals.

1.0 Safety Operating Procedures

1.1 General

- Common sense should prevail at all times. Each individual is responsible for safely carrying out assigned tasks so as to not endanger themselves or others around them. Field equipment specialists are also responsible for maintaining routine communication with the CASTNET FOM.
- Site work and driving will normally be accomplished between 7 a.m. to 10 p.m. to allow the greatest possibility of obtaining help in an emergency. Work outside of these hours is discouraged but may occasionally be conducted at the discretion of the individual employee in consultation with the FOM.
- No eating or drinking will be permitted within the monitoring site while handling any sampling media or working on electrical equipment.
- No smoking within the shelter or within 50 feet (ft) of any site equipment. Any individual smoking in the vicinity of the site shall observe appropriate local precautions against grass fires and forest fires.
- In the event of a fire, all personnel onsite must evacuate immediately and call emergency services when they arrive at a safe location.
- Safety belts shall be worn in all vehicles. The belts should be completely secured before the vehicle is put into gear and moved for any distance.
- Injuries will be reported immediately to the employee's direct supervisor, the Health and Safety Representative and the Project Manager.
- Work directed by WSP shall be performed by a WSP employee, WSP consultant, or WSP subcontractor.
- Emergency routes, telephone numbers of local authorities, and location of the nearest medical facility must be posted in a conspicuous location onsite.
- Authorized visitors to the site shall be directed to a safe distance from the work being performed by WSP, its consultants, or its subcontractors.
- Animals are not permitted inside the site boundary.

Figure 1.3 Fire Emergency Procedure

1.2 Equipment and Supplies

- Only safety equipment that meets or exceeds ANSI standards shall be used.
- A 16-unit first aid kit will be supplied at each site shelter. Field personnel will routinely and regularly check the stock conditions of the first aid kit. Any deficiencies will be reported to the FOM.
- Emergency routes, telephone numbers of local authorities, and the location of the nearest medical facility shall be posted in a conspicuous location onsite.

1.3 Weather Hazards

- No outdoor activity will take place during lightning, hail storms, heavy rain, blizzard conditions, or any other weather conditions that, in the opinion of the individual employee, represent an unreasonable hazard. Before arriving at each site, local conditions should be assessed to avoid danger from avalanche, wildfire, or other natural hazards.
    - Follow the 30:30 rule. Seek shelter when the time between seeing lightning and hearing thunder is less than 30 seconds. Remain sheltered until 30 minutes after seeing lightning or hearing thunder.
- Tower activity should be restricted to the daylight hours unless adequate lighting is provided for those working on a tower. This includes lowering the tilt-down towers for changing the filter packs and servicing O_3 and meteorological instruments, as appropriate. Additionally, please see section 1.5.

1.4 Electrical Hazards

- No eating or drinking will be permitted in the vicinity of any piece of electrical equipment which has its cover removed.
- Jewelry such as, rings, watches, bracelets, and necklaces shall not be worn while working inside electrical equipment.
- Power supplies or other high voltage devices shall not be repaired in the field but replaced with the power source disconnected or the power shut off at the breaker in the electrical panel.
    - Lock out/Tag out (LOTO) procedures (See Appendix C) will be utilized to ensure that the power supply remains secure against accidental activation.
        - Per Appendix C, LOTO procedures apply only to the air conditioning unit and floor heater at CASTNET sites. The associated breakers are identified at each site. If work is to be performed on either of these units a breaker lock out device will be used prior to commencement.
- When there is a chance that activation of an electrical circuit can produce physical harm or death, then the device shall be tagged identifying such information.

1.5 Tower Safety

Ten-meter aluminum tilt-down towers designed for single person operation are used at nearly all CASTNET sites. The worker remains at ground level. Exceptions are as follows:

- Individuals working above the ground shall secure themselves to the tower with a lifeline and safety harness or belt. Working at heights can only be done by trained individuals. DUK008, NC (scaffold tower at approximately 35 meters) requires a safety harness. This equipment will be provided by CASTNET and inspected by a competent person, the Gainesville office health and safety officer, prior to use in the field. See Appendix D for inspection and maintenance guidelines.
- Work above ground shall not be performed in high winds, if ice has accumulated on foot surfaces, or if an electrical storm is imminent.

1.6 Other Rules

Safety regulations specified by any site owner or for any facility at which work is performed will be observed. The Project Manager will determine these requirements and take steps to ensure compliance.

2.0 Site Description

QAPP Appendix 2 provides a list of CASTNET sites, including maps and directions from each site to a nearby hospital. Figure 2.1 shows a typical EPA-sponsored CASTNET site configuration, including instruments and their locations.

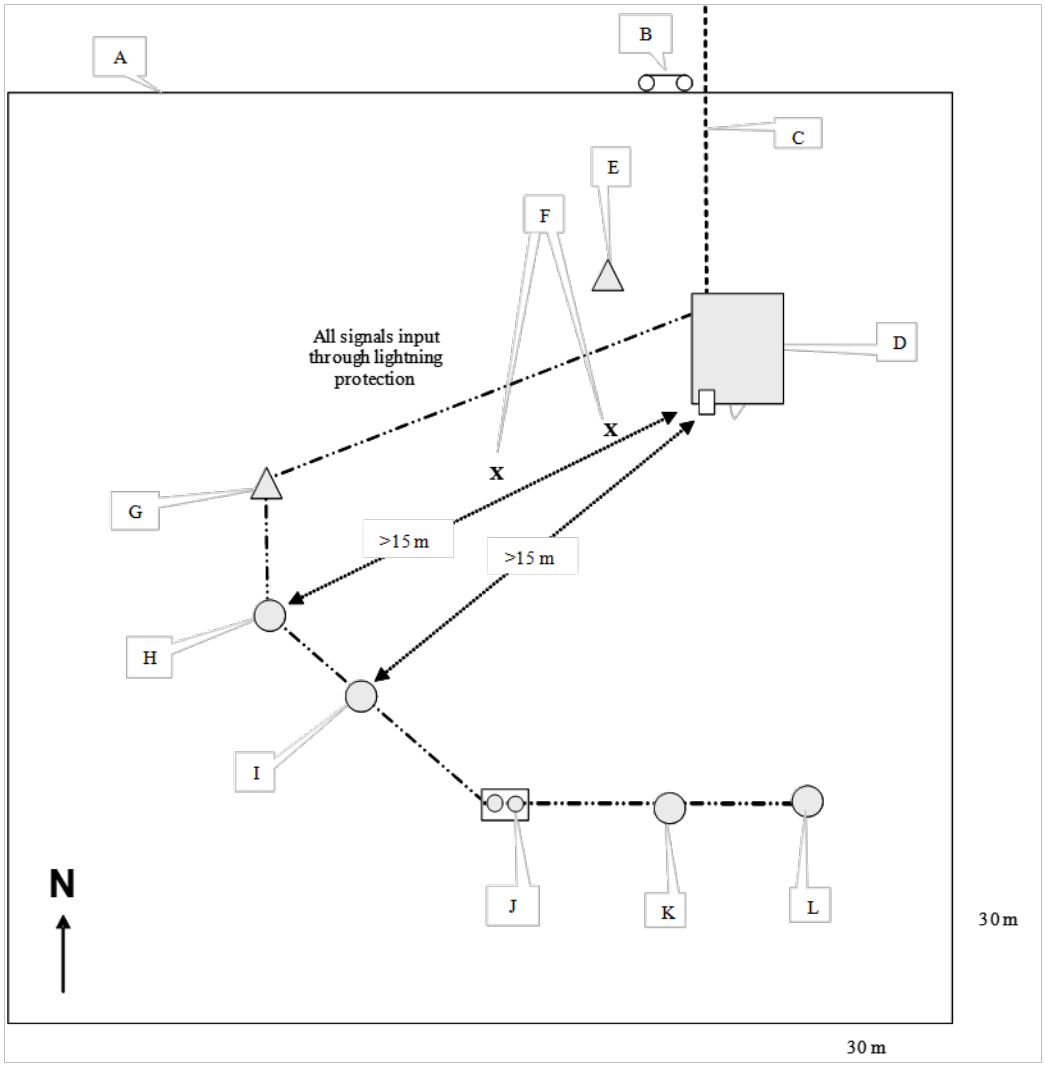
The following four general tasks will be performed at each site. More specific activities are listed in the subsequent table. See Table 9.1 for the PPE required for each task. Check the box to indicate whether a task will be conducted by WSP or subcontractor and whether an Activity Hazard Analysis (AHA) has been developed and included with this HASP.

WSP	Sub	Task	AHA Developed
☒	☐	Install Monitoring Systems	☒
☐	☒	Operate Monitoring Systems	☒
☒	☒	Calibrate and Repair Monitoring Systems	☒
☒	☒	Audit Monitoring Systems	☒

Activity	WSP	Sub	Activity	WSP	Sub
Lift heavy equipment	☐	☐	Working from scaffolding	☐	☐
Travel on forest roads	☒	☒	Working at heights >6 feet	☒	☒
Exposure to hazardous inhalation atmospheres*	☒	☒	Exposure to stinging or biting insects	☒	☒
Exposure to poisonous plants	☒	☒		☐	☐

*Preventive measures against release. Not present onsite otherwise.

Figure 2.1. Typical EPA-Sponsored CASTNET Site Configuration



A – Site Perimeter
B – Stub Pole, Disconnect, Electric Meter
C – 220 VAC/100 amp and Telephone Line (underground for at least the final 15 to 35 meters)
D – 8' x 10' Aluminum Environmental Shelter (Temperature Controlled)
E – Air Sampling Tower
F – Approximate Position of Tower Tops when lowered
G – Meteorological Tower
H – Tipping Bucket Rain Gauge (> 15m from shelter)
I – Solar Radiation Sensor (>15 m from shelter)
J – NADP/NTN Wet/Dry Collection (optional)
K– NADP/NTN NOAH IV Electronic Rain Gauge (optional)
L – Wetness Sensor

3.0 Key Personnel and Health and Safety Responsibilities

Figure 3.1 shows the project organizational chart. Table 3.1 describes health and safety responsibilities for key project personnel.

Figure 3.1. Project Organizational Chart

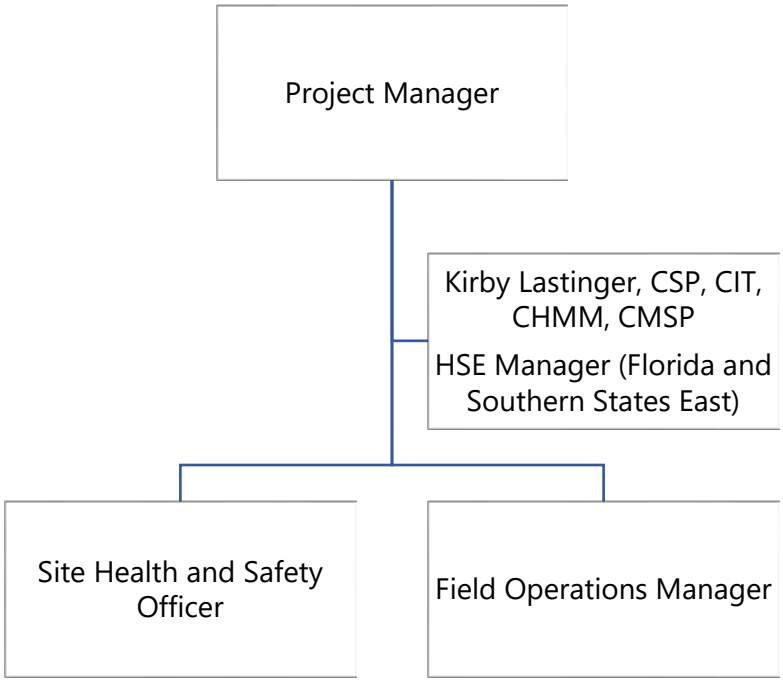


Table 3.1

Key Personnel Health and Safety Responsibilities

REGIONAL HEALTH, SAFETY, & ENVIRONMENT (HSE) MANAGER	FIELD OPERATIONS MANAGER	SITE HEALTH & SAFETY OFFICER (SHSO)	PROJECT PERSONNEL
▪ Implement appropriate corporate health and safety policies, or environmental projects. ▪ Approve HASP and amendments. ▪ Maintain exposure monitoring records. ▪ Notify Corporate Vice President of HSE in the event of an emergency situation. ▪ Verify that corrective actions recommended on Incident Analysis Forms have been implemented.	▪ See that personnel receive this plan; are aware of its provisions, including being aware of the potential hazards associated with site operations; are instructed in safe work practices; and are familiar with emergency procedures. Ensure that these actions are documented. ▪ Determine that appropriate monitoring and PPE are available. ▪ Monitor the Field Logbooks to ensure the health and safety work practices are employed. ▪ Coordinate with SHSO so that emergency response procedures are implemented. ▪ Ensure corrective actions recommended on Incident Analysis Forms are implemented.	▪ Implement project HASP; report to the Project Manager for action if any deviations from the anticipated conditions exist; and authorize the cessation of work at site investigations if necessary. ▪ Confirm that personnel have the health and safety training to qualify them to perform their assigned tasks. ▪ Conduct pre-entry briefing and ensure tailgate safety meetings are performed. Document meetings on Daily Tailgate Safety Meeting Checklist (Appendix B). ▪ Verify that all monitoring equipment and PPE is operating correctly according to manufacturer's instructions and such equipment is used by on-site personnel. Implement site emergency and follow-up procedures.	▪ Be familiar with and abide by the HASP. ▪ Notify the SHSO of any special medical conditions (e.g., allergies). ▪ Immediately report any incidents and/or unsafe conditions to the SHSO. ▪ No individual may go on site where he/she does not have the required safety training.

4.0 Worker Training

Upon designation of a specific project team, Table 4.1 will be completed to summarize the training experience of the project team with respect to HSE-PRO-100260, HSE-PRO-100262, HSE-PRO-100284 and WSP Integrated HSE Manual.

Maintain copies of training certificates in project files. For example, maintain certificates or documentation of training for both WSP employees and subcontractors:

- First Aid/CPR.
- Hazard Communication.
- Documentation of Annual Fire Extinguisher training (if fire extinguishers are present at the Site).
- Documentation of Fall Protection training (if working at elevations).

Table 4.1
Training Records

Role:	Required?	Field Team Members					
		Field Operations Manager (Add name)	Site Health and Safety Officer (Add name)	(Add name)	(Add name)	(Add name)	(Add name)
Training/Medical		**Dates**	**Dates**	**Dates**	**Dates**	**Dates**	**Dates**
First Aid [1, 2]	X						
CPR [1, 2]	X						
Hazard Communication	X						
Project Subcontractor Management [3]							
Fall Protection [1]	X						
Fire Extinguisher [1]	X						

[1] If applicable.

[2] At least one worker must be trained in First Aid/CPR.

[3] Required if acting as Field Operations Manager or SHSO.

5.0 Site Control

Most sites are fenced. Sites without fences have restricted access, e.g., by private land and remote/obscure locations. Some sites may not be fenced if they are near sensitive land or are publically visible. However, all towers and shelters are locked (including small footprint enclosures).

Site Access

Access to the Site will be controlled using the following method(s):

☒ Sign in/sign out log ☐ Guard
☐ Identification badges ☒ Other: Fencing and restricted access

General Safe Work Practices

General safe work practices to be implemented during work activities at this site are included in Table 5.1.

Table 5.1
General Safe Work Practices

- Smoking, eating, or drinking after entering the work zone and before decontamination will not be allowed. Use of illegal drugs and alcohol are prohibited.
- Practice good housekeeping. Keep everything orderly and out of potentially harmful situations.
- In an unknown situation, always assume the worst conditions.
- Be observant of your immediate surroundings and the surroundings of others. It is a team effort to notice and warn of impending dangerous situations. Withdrawal from a hazardous situation to reassess procedures is the preferred course of action.
- Conflicting situations may arise concerning safety requirements and working conditions and must be addressed and resolved rapidly by the SHSO, and Project Manager to relieve any motivations or pressures to circumvent established safety policies.
- Unauthorized breaches of specified safety protocol will not be allowed. Workers unwilling or unable to comply with the established procedures will be discharged.

6.0 Hazard Analysis

6.1 Activity Hazard Analysis

AHAs have been performed for each task associated with this project. Example AHAs are given below and all provided in Appendix A.

Activity-Specific AHAs:

☒	Lifting loads
☒	Travel on forested roads
☐	Parking
☒	Handling trailers and related activities
☐	Loading/unloading equipment
☐	

Hazard-Specific AHAs:

☒	Insect Stings and Bites
☒	Hypothermia
☒	Hyperthermia
☒	Exposure to hazardous Inhalation atmospheres*
☒	Exposure to poisonous plants
☒	Handling electrical equipment

*Preventive measures against release. Not present onsite otherwise.

7.0 Air Monitoring

As per project design, CASTNET sites are selected to perform rural, background level, monitoring of weekly concentrations of acidic pollutants, base cations, and chloride (Cl^-) using a 3-stage filter pack and of hourly O_3 concentrations using continuous analyzers. There are no ambient COCs and therefore no site safety-related air monitoring.

8.0 Dust Control

CASTNET sites were selected to characterize regional air quality and avoid local sources of dust and other pollutants. Site operators will note on Site Status Report Forms (e.g., Figure 3-2 in QAPP Main Body) the presence of dust and particulate material produced by open burning, forest fires, tilling, and nearby construction but these are not expected to reach levels of health and safety concern at CASTNET sites.

9.0 Personal Protective Equipment

In general, the PPE includes:

- Safety glasses
- Hard hats
- Safety shoes, and
- Lifelines and harness if working at elevation
- Hearing protection (earmuffs, earplugs), if necessary
- High-visibility/reflective vest
- Work gloves (if necessary)

Table 9.1

Task-Specific PPE Requirements

Personal Protective Equipment	General Site Work (inspections, maintenance, etc.)	Site Installations
Hard hat	X	X
Safety glasses/goggles	X	X
Lifelines/harnesses	A	A
Hearing protection (earmuffs, earplugs)	A	A
Steel-toed boots	A	A
High-visibility/reflective vest	A	A
Work gloves	A	A

X = required A = available

10.0 Emergency Response

Emergency response information is provided according to the WSP Hazardous Waste Operations and Emergency Response Program. CASTNET shelters provide protection in case of a storm or other short-term emergencies. Evacuation routes are specified.

10.1 Hospitals/Clinics

A nearby hospital has been identified for all sites. Maps from CASTNET sites to hospitals are provided in QAPP Appendix 2, CASTNET Site Contact List. Written directions are also provided.

Table 10.1
Emergency Contacts

Name	Telephone Numbers		Date of Pre-Emergency Notification (If Applicable)
Fire Department:	911		
Hospital*:			
Police Department:	911		
TriageNow (early injury case management)	(877) 311-0038		
	Office	**Cell/Home**	
Site Health and Safety Officer:	352-333-6620	352-665-6620	
Client Contact**:			
Project Manager:			
Regional HSE Manager: Kirby Lastinger (See also Figure 10.1 – Incident Flow Chart)	863-272-4775	863-581-7749 (C)	
EPA (if applicable):			
Other: Ambulance	911		

*Maps from CASTNET sites to hospitals and telephone numbers are provided in QAPP Appendix 2, CASTNET Site Contact List. Written directions are also provided.

**Primary contact information provided in QAPP Appendix 2, CASTNET Site Contact List.

10.2 Emergency Response Equipment

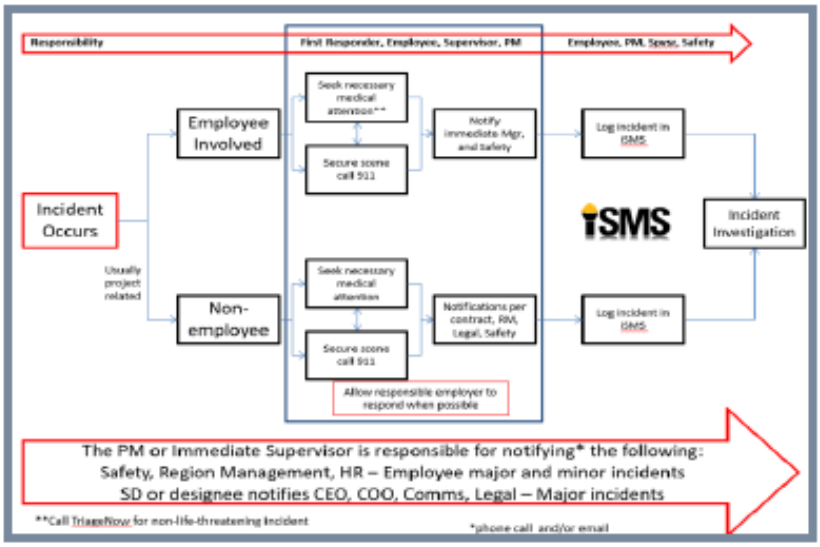
The following emergency response equipment is required for this project and will be readily available.

- ☒ Field first aid kit (including blood-borne pathogen kit/supplies)
- ☒ Fire extinguisher
  - ☐ Type A (combustible materials)
  - ☐ Type B (flammable liquids and gases)
  - ☐ Type C (does not conduct electricity – to be used on electrical equipment)
  - ☒ Type ABC
- ☒ Eyewash
- ☐ SCBA
- ☐ Shower
- ☐ Other: Respirator

Figure 10.1. Incident Flow Chart

Incident flow chart

Call immediately!



TriageNow: (877) 311-0038

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Safety Manager Name/E-Mail	Region	Contact Information
Renee Weaver Renee.weaver@wsp.com	E&E USA	(336) 707-3869 (cell)
Greg Ertel gregory.ertel@wsp.com	Applied Solutions	(585) 465-0557 (cell)
Carissa Johnsen carissa.johnsen@wsp.com	Oil & Gas and Power	(201) 618-2151 (cell)
Kevin Dunsmore kevin.dunsmore@wsp.com	Northeast Region: Mid-Atlantic District Commercial and Industrial	(856) 373-6576 (cell)
Jeff Tweeddale jeff.tweeddale@wsp.com	Northeast Region: New England / New York Districts	(860) 805-5883 (cell)
Kirby Lastinger kirby.lastinger@wsp.com	Southeast Region: Florida / Southern States East Districts	(863) 272-4775 (cell)
Michele Barnhart michele.Barnhart@wsp.com	Southeast Region: Southern States West / Capital District	(919) 491-7710 (cell)
Mike Larson michael.larson@wsp.com	Central Region: Plains / Texas / Mid-West / Federal	(719) 502-7921 (cell)
Gary Hall gary.hall@wsp.com	West Region: Southwest Mountain / Mining	(406) 201-0345 (cell)
TBD	West Region: Northwest Pacific / California	TBD

Incidents requiring reporting include injuries, illnesses, high potential near misses, unsafe work refusals, workplace violence / harassment, security incidents, subcontractor incidents, regulatory inspections, spills, and property damage.

The Supervisor is responsible for Local/Client Notifications, entering incident into iSMS, and Drug/Alcohol Testing coordination as per client and WSP requirements.

Download iSMS Mobile App. Open the app, enter iSMS URL: zeroharm.onepb.net. Available on Google Play or the App Store.

WSP USA Environment & Infrastructure | Rev. May 2023

10.3 Communications

On-site communications will be conducted as follows:

- ☒ Verbal
- ☐ Two-way radio
- ☒ Cellular telephone
- ☐ Hand signals

Hand gripping throat	Out of air, can't breathe
Grip partner's wrist or both hands around waist	Leave area immediately
Hands on top of head	Need assistance
Thumbs up	OK, I am all right, I understand
Thumbs down	No, negative

- ☐ Horn/siren
- ☐ Other: _____

Off-site communications will be conducted as follows:

- ☒ Cellular telephone
- ☐ Landline/payphone – location: _____
- ☐ Other: _____

10.4 Emergency Response Procedures

In the event of an on-site emergency, the procedures delineated in Table 10.2 should be followed immediately.

For injuries requiring medical treatment beyond first aid, and for work-related vehicle incidents where one or more vehicles have been towed, the employee must submit a post-incident drug test. It is the responsibility of the Supervisor/Project Manager to ensure that the employee who has had an on-the-job incident (as defined in WSP Human Resource Policy HRM-PRO-100347 - US - DRUGS, ALCOHOL, TOBACCO AND SMOKING) submits to this required testing.

Table 10.2
Emergency Procedures

- The SHSO (or alternate) should be immediately notified via the on-site communication system. The SHSO will assume control of the emergency response.
- The SHSO will notify the Project Manager and the client contact of the emergency. The SHSO will then contact the Eastern Group HSE Manager, who will contact the Vice President of HSE.
- If applicable, the SHSO will contact off-site emergency responders (e.g., fire department, hospital, police department) and will inform the response team as to the nature and location of the emergency on site.
- If applicable, the SHSO will evacuate the Site. Site workers should move to the predetermined evacuation point (see Site Map).
- For small fires, flames should be extinguished using the fire extinguisher, if safe to do so and workers are trained. Large fires should be only handled by the local fire department.
- If chemicals are accidentally spilled or splashed into eyes or on skin, use eyewash and/or shower (if available).
- If a worker is injured, first aid should be administered by a certified first aid provider.
- An injured worker must be decontaminated appropriately.
- After the response, the SHSO will follow up with the required company reporting procedures.

10.5 WSP Early Injury Case Management Program

If the emergency involves an injury to a WSP employee, the HSE Coordinator or Field Operations Manager will implement the WSP Early Injury Case Management Program. See procedures below.

Figure 10.2. TriageNow

Confined Space Entry

Yes	No	
☐	☒	The task(s) for this project involves confined space entry.

If yes, see applicable AHA in Appendix A.

Spill Containment

Yes	No	
☐	☒	The task(s) for this project involves drum/tank/container sampling, excavation, transportation, etc.

10.6 Recordkeeping

At the end of the project, the following items should be maintained in the project file:

☒	HASP
☒	Incident Analysis/Vehicle Incident Forms/Ground Disturbance Report (if applicable)
☐	Log notebooks

Appendix A: Activity Hazard Analysis

AHA – Work at CASTNET Monitoring Sites
Site Calibration, Operation, and Servicing

Activity/Work Task:	See Activity Table		Substantial / High Risks:	**List High/Substantial Hazards and identify highest residual RAC**	Highest RAC: (residual) **M**
Project Location:	EPA Sponsored CASTNET Sites				
Contract Number:	68HERH21D0006				
Date Prepared:	10/4/22	**Date Accepted:**			
Prepared by (Name/Title):	Marcus Stewart Sr II QA Rep.				
Reviewed by (Name/Title):					

Risk Assessment Code (RAC) Matrix

Severity \ Probability	Almost certain	Likely	Possible	Unlikely	Rare
Catastrophic	E	E	H	H	M
Critical	E	H	H	M	L
Marginal	H	M	M	L	L
Negligible	M	L	L	L	L

Notes: (Field Notes, Review Comments, etc.)
This AHA involves the following:

- Establishing site specific measures for the specified activity
- **BOLD hazards correspond to Substantial or High Risk**.

This AHA is not an exhaustive summary of all hazards associated with the Site. Refer to the project HASP or client information for additional requirements, and emergency procedures.

Workers to follow general site safety controls for Hazard Signage/PPE, Housekeeping, Slips Trips and Falls, Biological hazards, Mobile equipment, Confined spaces, Fall hazards, Electrical, and any active operating equipment or construction activities.

Step 1: Review each **"Hazard"** to identify Probability and Severity (Refer to Safety Management and Risk Tool)

- **"Probability"** is the likelihood to cause an incident, near miss, or accident and identified as: Almost certain, Likely, Possible, Unlikely, Rare.
- **"Severity"** is the outcome/degree if an incident, near miss, or accident did occur and identified as: Catastrophic, Critical, Marginal or Negligible

Step 2: Identify the RAC-Inherent as H, S, M, or L for each "Hazard" on AHA, ***before* controls are applied.**

Step 3: Identify the RAC-Residual as H, S, M, or L for each "Hazard" on AHA, ***after* controls are applied.**

Step 4: Annotate the overall highest RAC-Residual at the top of AHA.

Risk Categories

- **H = High Risk**
- **S = Substantial Risk**
- **M = Moderate Risk**
- **L = Low Risk**

MANAGEMENT OF CHANGE: If there is a change or deviation from the planned activity, you must stop the job and re-evaluate the risk assessment and the precautions taken. Any changes to work described in this AHA shall require review by a Qualified Person.

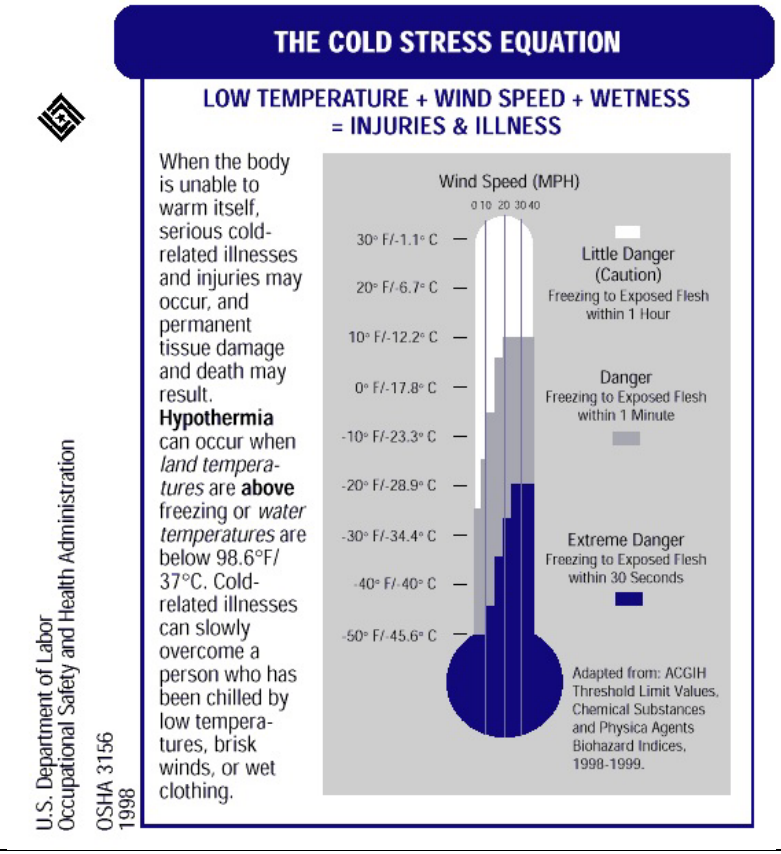
Check all Life Saving Rules that apply:									
	☐ Bypassing Safety Controls		☐ Confined Space		☑ Driving		☐ Energy Isolation		
☐ Hot Work		☐ Line of Fire		☑ Work Authorization		☐ Safe Mechanical Lifting		☐ Working at Height	

Equipment to be Used	Training Requirements/Competent or Qualified Personnel name(s)	Inspection Requirements
PPE (Specify: Hard Hat, safety glasses, gloves, steel toe work boots, high visibility safety vest, hearing protection, respirator, etc.) Refer to Minimum PPE Requirements and specify as per risk assessment where required.	**Competent / Qualified Personnel:** Justin Knoll, Health and Safety Officer **Training requirements:** List specific certification (as applicable) Site Specific HASP Orientation Toolbox safety meeting Task kick-off meeting	Inspect all PPE prior to use Daily inspection of equipment per manufacturer's instructions. Tag tools that are defective and remove from service.

AHA – Work at CASTNET Monitoring Sites
Site Calibration, Operation, and Servicing

Job Steps	Hazards	Controls	RAC
1. Lifting Heavy Equipment and other ergonomic activities	Ergonomic Issues	Ergonomic Issues • Use safe lifting techniques	**Select One / shade cell colour: L**
2. Communicating Hazards	Safety, crew unity	• Talk to each other. • Let other crewmembers know when you see a hazard. • Avoid working near known hazards. • Always know the wherabouts of fellow crewmembers. • Carry a radio and spare batteries or cell phone. • Review Emergency Evacuation Procedures (see below).	**Select One / shade cell colour: L**
3. Mobilization: Travel on Forest Roads	1. Poor visibility 2. Backing 3. Clearing obstacles from roadway 4. Carbon monoxide poisoning 5. Vehicle wear/tear 6. Animals on road	1. Use care in tall brush and grass, clear debris from roadways rather than trying to drive over or around 2. Drive on the main roadway, avoid soft gravel shoulders, do not straddle a gravel berm or drive with wheels on berm, pull over and stop if you have to look at a map 3. Slow down! Don't drive on the road if there is potential for resource or vehicle damage. Use 4WD drive to get out of trouble, not into trouble. Consider carrying and using chains if conditions warrant. Know how to put on chains, ask about road conditions before traveling. 4. Follow from a safe distance. Pull off road when oncoming vehicle is passing 5. Keep windows clean inside and out, keep dash clear. Maintain safe speeds, replace badly damaged or cracked windshields, make sure wipers are in good condition. 6. Try to park so that you do not have to back up to leave. Use mirrors and a spotter, if you do not have a spotter, get out to check behind your vehicle before backing. 7. Keep vehicle well ventilated when idling/heating by opening a window at least 6 inches. 8. When descending forest roads, use a lower gear to control your speed, rather than the brakes. Take care of the vehicle you drive. 9. Drive slowly, watch for animals.	**Select One / shade cell colour: M**
4. Parking	Run-away vehicle	Use chock blocks when parking, set parking brake, do not leave vehicle unattended when it is running.	**Select One / shade cell colour: L**
5. Connecting trailer	Pinching fingers, mashing toes, back strain	Use caution, be aware of hand placement, use proper lifting techniques (i.e., lift with legs not the back, get assistance as necessary). Wear gloves, steel-toed shoes, and back support. Use trailer jack to lift tongue.	**Select One / shade cell colour: L**
6. Towing trailer if necessary in establishing a new monitoring stie or when installing or replacing a tower.	Trailer disconnecting Tire Blowout Bearing seizure, failure Sway or whipping stopping	1. Verify ball and coupler are same size, use safety chains crossed under coupler, use lock or bolt to secure coupler latch 2. Inspect tires for wear and correct pressure 3. Check for overheating during (after approximately 10 miles) each trip, repack at least once a year. 4. Use slower speed, especially in windy situations. Increase following distance, extra weight of trailer increases stopping distance. Do not compensate for sway, hold steady course. Be alert when turning, do not "curb" the trailer tires.	**Select One / shade cell colour: L**
7. Backing Trailer	Jack knifing, hitting objects	Physically inspect path yourself before backing, use a guide person, and avoid sharp turns.	**Select One / shade cell colour: L**
8. Lifting and carrying items	8A) Muscle strain/injury	8A) Muscle Strain/Injury Use proper lifting techniques when lifting heavy objects; get assistance or use mechanical device (dolly or cart).	**Select One / shade cell colour: L**

	8B) Slips/Trips/Falls	8A) Slips/Trips/Falls • Slow down, watch out for spills, and clean up puddles. • Maintain clear passage; do not store items in aisleways. • Watch for obstacles in path. • Use activity appropriate equipment to reach overhead items (e.g., ladder, step stool) • Do not run up or down the stairs. • Always have one hand free to hold handrail when climbing up and down the stairs.	**Select One / shade cell colour: L**
9. Wreck of vehicle while being driven	Wreck of vehicle while being driven	Wreck of vehicle while being driven • All drivers shall be have proper license. • Supervisors shall verify that drivers are capable and qualified on each type of equipment before allowing the equipment to be used unsupervised. • Keep wind shields, windshield wipers, side mirrors and side windows clean • Drivers shall conduct a pre-operation vehicle safety check • Drivers shall plan ahead to minimize or eliminate the need for backing. Always check to the rear before backing and use an observer (spotter) when available. If an observer is not available, the driver shall walk around the vehicle to make sure rear is clear prior to backing. (Get out and look) • Seat belts shall be worn when driving by driver and passengers. • Choose the safest location possible to park equipment. Avoid parking in blind spots of other equipment. • If so equipped, driver is to be sure the back-up alarm is working • Adjust vehicle speed for load and weather. Tire chains should be utilized as dictated by weather conditions. • Operators should always check and be sure of load height. • When operating a vehicle off the roadway, be aware of possible hidden objects in the grass and unstable terrain. • Never allow anyone between truck and trailer when backing to hook trailer • Make sure tilt beds or ramps are secured before putting trailer in use • If carrying a load, perform periodic checks of equipment on long trips to assure the load is secure.	**Select One / shade cell colour: L**
10. Loading/unloading/installing equipment (includes 10-meter sampling towers)	Lifting and carrying items Crush and pinch points created when loading/unloading equipment Tower installation/Deinstallation	Use proper lifting techniques when lifting heavy objects; get assistance or use mechanical device (dolly or cart). Crush and pinch points created when loading/unloading equipment • Be aware of crushing and pinching hazards when loading, unloading and fastening down equipment. • For transporting, make sure cargo is properly loaded, secured and covered using only approved chain and load binders. Check for loose material on bed and trailer. Secure loose material. • Wear protective equipment consistent with the hazard (hard hats, safety glasses, leather gloves, safety shoes, etc.) • Hook/unhook on stable ground with any transport device (e.g. trailer) secure. Installation/deinstallation of towers • Check the weather – do not perform tower work in the rain, strong winds, or during lightning • Read and follow the written instructions supplied for the job • Ensure all parts for assembly are present and undamaged. Only proceed with a complete and undamaged set • Requires a minimum of two crew members. Use more if the situation warrants • Stay alert - warn others of possible dangers • Walk the tower up/down taking care to maintain control – work together	**Select One / shade cell colour: L**

11. Hypothermia	Cold Stress	Check weather prior to on outside activities; wear adequate clothing and gloves, if appropriate, for weather; rain wear where appropriate due to water spray to remain dry; maintain body temperature; recognize and treat any medical condition by calling 911 (or local emergency number) at once. 	**Select One / shade cell colour: L**

12. Hyperthermia	Heat stress	Check weather prior to work activities; Know signs/symptoms of heat-related illnesses: monitor yourself and coworkers; Block out direct sun or other heat sources; Use cooling fans/air-conditioning; rest regularly; Drink lots of water, about 1 cup every 15 minutes; Wear light weight, light colored, loose-fitting clothes, Avoid alcohol, caffeinated drinks, or heavy meals. Call 911 (or local emergency number) at once.	**Protect Yourself** **Heat Stress**  When the body is unable to cool itself by sweating, several heat-induced illnesses such as heat stress or heat exhaustion and the more severe heat stroke can occur, and can result in death. **Factors Leading to Heat Stress** High temperature and humidity; direct sun or heat; limited air movement; physical exertion; poor physical condition; some medicines; and inadequate tolerance for hot workplaces. **Symptoms of Heat Exhaustion** • Headaches, dizziness, lightheadedness or fainting. • Weakness and moist skin. • Mood changes such as irritability or confusion. • Upset stomach or vomiting. **Symptoms of Heat Stroke** • Dry, hot skin with no sweating. • Mental confusion or losing consciousness. • Seizures or convulsions. **Preventing Heat Stress** • Know signs/symptoms of heat-related illnesses; monitor yourself and coworkers. • Block out direct sun or other heat sources. • Use cooling fans/air-conditioning; rest regularly. • Drink lots of water; about 1 cup every 15 minutes. • Wear lightweight, light colored, loose-fitting clothes. • Avoid alcohol, caffeinated drinks, or heavy meals. **What to Do for Heat-Related Illness** • Call 911 (or local emergency number) at once. While waiting for help to arrive: • Move the worker to a cool, shaded area. • Loosen or remove heavy clothing. • Provide cool drinking water. • Fan and mist the person with water. For more complete information: OSHA Occupational Safety and Health Administration U.S. Department of Labor www.osha.gov (800) 321-OSHA	**Select One / shade cell colour: L**

AHA – Work at CASTNET Monitoring Sites
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13. Onsite hazards	13A) Exposure to hazardous Inhalation atmospheres.	13A) Ensure that ozone analyzers are vented outside of the monitoring shelter. Handling of compressed gas cylinders. Oxygen deficiency; heavy object; gases under pressure; chemical (low concentrations); gases present are NH_3, N Propyl Nitrate and a mixture of CO, SO_2 and NO. • A cylinder should always carry a legible label or stencil identifying its contents. Do not use the cylinder if the contents are not properly identified. • Labels or identifying markings on cylinders should face out such that they are clearly visible. • Ensure cylinders are stored and used in a dry, well ventilated area. • All cylinders, whether full or empty, must be secured in an upright position by a chain or strap system made for this purpose. • Cylinders should be stored out of direct sunlight and away from other heat sources. Cylinders should be stored at temperatures above freezing and below 125 degrees F. • Cylinder valves should be closed except when the cylinder is in active use. • Always use an appropriate pressure regulator with each cylinder. • Open cylinder valves and regulators slowly. • The main cylinder valve should always be opened before opening the downstream regulator valve. • Once the cylinder is installed, test for leaks. If gas leaks are detected, shut down the system, relieve pressure and tighten connections until leaks are corrected. If you cannot correct the problem, lock and tag out the system until repairs can be made by trained personnel. • Do not vent any gas inside a building without adequate ventilation. • Never bleed a cylinder below 25 pounds per square inch (psi). • If a cylinder valve leaks and it can be safely moved, take it outdoors and slowly empty the bottle. If moving the cylinder is not possible or safe, evacuate the area and call the fire department. • Any and all repairs and refilling shall be made only by qualified individuals. • Do not place a cylinder where it might become part of an electric circuit. • Cylinders that are not connected or in use, must be fitted with a valve protection cap. • Valve protection caps must be in place when cylinders are moved. • No tools, including wrenches and hammers shall be used to open or close cylinder valves. • Cylinder valves must be verified closed before moving the cylinder. • Larger cylinders, which cannot be easily carried, shall be moved using a wheeled cart. • Cylinders shall never be rolled or dragged, nor lifted by the valve cap. • Cylinders must never be violently struck or allowed to strike another object. • Foot protection meeting the most current ANSI Z41 standard for safety shoes is required when moving gas cylinders. • Safety glasses or other face and eye protection should be employed when installing or removing regulators.	**Select One / shade cell colour: L**

	13B) Training – Identifying Poisonous Plants	13B) Provide training on identifying the specific poisonous plants that could be present at the site 	**Select One / shade cell colour: M**
	13B) 1. Poison Ivy 	13B) 1. Poison Ivy: • Grows everywhere in United States except Hawaii and Alaska. • In the East, Midwest, and the South, it grows as a vine. • In the Northern and Western United States, it grows as a shrub. • Each leaf has three leaflets. • Leaves are green in the summer and red in the fall. • In the late summer and fall, white berries may grow from the stems.	**Select One / shade cell colour: M**
	13B) 2. Poison Oak 	13B) 2. Poison Oak: • Oak-like fuzzy leaves in clusters of three. • It has two distinct kinds: • Eastern poison oak (New Jersey to Texas) grows as a low shrub. • Western poison oak (Pacific Coast) grows to six-foot-tall clumps or vines up to 30 feet long. • It may have clusters of yellow berries.	**Select One / shade cell colour: L**
	13B) 3. Poison Sumac 	13B) 3. Poison Sumac • Grows in standing water in peat bogs in the Northeast and Midwest and in swampy areas in parts of the Southeast. • Each leaf has clusters of seven to 13 smooth-edged leaflets. • The plants can grow up to 15 feet tall. • The leaves are orange in spring, green in summer and red, and orange or yellow in fall. • There may be clumps of pale yellow or cream-colored berries.	**Select One / shade cell colour: L**

	13B) 4. Giant Hogweed  Giant Hogweed  Giant Hogweed Flower (clusters may reach up to 2.5 feet across)  Giant Hogweed Flower Leaves  Giant Hogweed Stem Thick stem with coarse hairs, Blistery dark purple splotches.	13B) 4. Giant Hogweed • Hogweed is a public health hazard. Its clear, watery sap has toxins that cause photo-dermatitis. Skin contact followed by exposure to sunlight produces painful, burning blisters that may develop into purplish or blackened scars. Contact with the eyes can cause temporary or permanent blindness. • Since its introduction into North America, this plant has become established in rich moist soils along roadsides, stream banks and waste ground. In the eastern US, it is known to occur in Maine, New York, Pennsylvania, Connecticut, and Massachusetts. • A biennial or perennial herb growing 8 to 15 feet tall, giant hogweed usually has a taproot or occasionally fibrous root. The hollow stems are 2 to 4 inches in diameter with dark reddish-purple splotches and coarse white hairs. • The deeply incised compound leaves grow up to 5 feet in width. Hairs on the underside of the leaf are stiff, dense and stubby. • The large umbrella-shaped flower heads are up to 2 1/2 feet in diameter across a flat top with numerous small flowers produced in mid-May through July. • Some plants die after flowering; others flower for several years. The plant produces flattened, 3/8 inch long, oval dry fruits that have a broadly rounded base and broad marginal ridges. Plants sprout in the early spring (or late winter in mild years) from the roots or from seed. • Grows in standing water in peat bogs in the Northeast and Midwest and in swampy areas in parts of the Southeast. • Each leaf has clusters of seven to 13 smooth-edged leaflets. • The plants can grow up to 15 feet tall. • The leaves are orange in spring, green in summer and red, and orange or yellow in fall. • There may be clumps of pale yellow or cream-colored berries.	**Select One / shade cell colour: L**

	13C) Hand Contact	13C) Hand Contact • Apply IvyX (or similar product) to hands, forearms and other potentially exposed parts of the body, prior to starting work in the morning and again right after lunch. • Leather Gloves must be worn at all times when digging, screening or carrying field equipment. • Leather gloves should be of sufficient length to cover the entire wrist and cuff of the shirt. • Carefully remove gloves, without touching the exterior surface, when taking notes and prior to lunch or restroom breaks. • Gloves that become worn should be replaced immediately. • Do not scratch or rub the face or other exposed skin while wearing gloves. • Workers will apply Tecnu (or similar product) to the hands and forearms immediately after removing their gloves, prior to lunch and again at the end of the day. Tecnu will help cleanse the urushiol oil from the skin before it can be absorbed. Sensitive individuals can also apply prior to showering in the evening.	**Select One / shade cell colour: L**
	13C) 1. Arm Contact	13C) 1. Arm Contact • Apply IvyX (or similar product) to hands, forearms and other potentially exposed parts of the body, prior to starting work in the morning and again right after lunch. • Wear light weight, long sleeved shirts as the sleeves will provide a physical barrier between the skin and any urushiol oil encountered. Disposable gauntlets may we worn over arms to keep oil from clothing as well. • Have the sleeves pulled down to the base of the hand, covering the forearm and wrist (all exposed skin). • Workers will apply Tecnu (or similar product) to the hands and forearms immediately after removing their gloves, prior to lunch and again at the end of the day. Tecnu will help cleanse the urushiol oil from the skin before it can be absorbed. Sensitive individuals can also apply prior to showering in the evening.	**Select One / shade cell colour: L**
	13C) 2. Leg Contact	13C) 2. Leg Contact • Wear long pants and boots. • Assume boots are contaminated with the urushiol oil and only handle with gloved hands.	**Select One / shade cell colour: L**
	13D) Exposure from Handling Contaminated Equipment	13D) Exposure from Handling Contaminated Equipment • Exposure from Handling Contaminated Equipment • Do not handle any field equipment that may have come in contact with poison ivy/oak/sumac without gloves. • Decontaminate all equipment at the end of each workday with a solution of water and dish soap. • Scrub all surfaces of the screens and shovels with a brush. • Rinse with cool water using a portable garden sprayer.	**Select One / shade cell colour: L**
	13D) Handling 1. Exposure from Contaminated Clothing	13D) 1. Exposure from Handling Contaminated Clothing • Wash clothing potentially contaminated with urushiol oil prior to wearing again. • Handle contaminated clothing with gloves as the oil can remain on environmental surfaces for up to 5 years.	**Select One / shade cell colour: L**

	13E)	Contact with biting insects (i.e. spiders, bees, ticks, etc.)	13E)	Contact with stinging/biting insects • Look for signs of insects. Discuss the types of insects expected at the Site and be able to identify them. • Wear Modified Level D PPE as described in the HASP. In addition, wear long sleeve shirts, pants tucked into boots, and a hat. Wear light colored fabric in order to see insects. Protective netting that may be worn over your head/face maybe necessary in some instances. • Avoid contact with the insects if possible. • Inform your supervisor and the Site Health and Safety Supervisor if you have any allergies to insects and insect bites. Make sure you have identification of your allergies with you at all times and appropriate response kits if applicable. • Get medical help immediately if you are bitten by a black widow or brown recluse, or if you have a severe reaction to any spider bite.	**Select One / shade cell colour: L**
	13F)	Electricity	13F)	Exposure to electricity • Always make sure all electrically-powered sampling equipment is in good repair. Report any problems so the equipment can be repaired or replaced. • Never do repairs on electrical equipment unless you are both authorized and qualified to do so. • Use only correctly grounded equipment. Never use three-pronged cords which have had the third prong broken off. • Watch for wires and connections which are damaged, worn or broken. • Use a Ground Fault Circuit Interrupter (GFCI) when using electrically-powered sampling equipment outdoors or in a damp area. Do not handle any electrical equipment, including cords and plugs, with wet hands. Keep all sampling equipment (except the portion that is designed to be submersed in water) dry. • When unplugging a cord, pull on the plug rather than the cord.	**Select One / shade cell colour: L**
	13G) –	Working at height – (Currently applies only to White Face Mountain, NY site WFM007)	13G)	Working at height • Always wear an inspected and approved fall protection device. • Only work at height after being trained in the proper use of your fall protection device. • Always have a second person onsite when using fall protection devices.	**Select One / shade cell colour: L**

AHA – Work at CASTNET Monitoring Sites
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FIELD ACKNOWLEDGEMENT OF PERSON(S) CARRYING OUT WORK

NAME(S):	SIGNED:	DATE:
MEETING LEADER:	SIGNED:	DATE:

BY SIGNING – You Acknowledge that:

- I have read and understand all job steps, hazards and controls associated with today's work.
- Further, I WILL stop any job I think is unsafe.
- I have completed a site-specific HASP Orientation
- I have participated in a daily tailgate safety meeting

For tasks/activities that extend beyond a single day, use AHA RENEWAL form or Point of Work Risk Assessment (PoWRa).

Appendix B: Tailgate Safety Meeting Checklist

Tailgate Safety Meeting

Site ID: _____ **Project:** CASTNET

Site H&S Officer: Michael Smith **Signature:** _____

Date: **Type of work to be done today:**

_____ _____

_____ _____

_____ _____

_____ _____

Safety calls/contacts to WSP upon arrival and prior to departure: michael.j.smith@wsp.com
☐ Safety call upon arrival (Time: _____) ☐ Safety call prior to departure (Time: _____)

Note: Safety calls/contacts are required if working alone.

Protective Clothing/Equipment suggested/required for all sites unless otherwise noted:
☐ Hard Sole Boots ☐ Work Gloves ☐ Clothing ☐ Harness ☐ Safety Glasses Other: _____

Chemical Hazards: ☐ Ozone Buildup ☐ $CO/SO_2/NO$ Buildup Other: _____

Physical Hazards: ☐ Ladder Safety ☐ Electrical Hazards ☐ Hunting Activity Other: _____

Biological Hazards: ☐ Poisonous Plants ☐ Biting/Stinging Insects Other: _____

Y ☐ **N** ☐ Emergency Medical Information including directions to the nearest hospital are posted clearly inside the shelter.

Emergency Procedures: **CPR, First Aid, Transport**

Call SHS Officer Mike Smith (352) 665-6620
Call Field Operations Manager Ph# (352) 339-5394

Emergency Medical: **Fire, Sheriff, Ambulance, Police-911**
Hospital Location and Hospital: _____

_____

Special Equipment: ☐ Power Tools (Type: _____) Other: _____

Accidents/Incidents *(include locations and dates of occurrence)*:

_____

_____

ATTENDEES	**DATE & TIME**

Appendix C: E&I Control of Hazardous Energy (Lockout/Tagout) P.2.1.3 (US)

EI CONTROL OF HAZARDOUS ENERGY (LOCKOUT/TAGOUT) - US

Document number:	**HSE-PRO-100260**
Applicability:	United States, Environment & Infrastructure Solutions
Document owner:	Vladimir Ivensky, Senior Vice President HSSE
Document checker:	Chad Barnes, Senior HSSE Manager
Document author:	Cindy Sundquist, Senior HSSE Manager
Revision:	0
Revision date:	29-Mar-2021
This document supports HSE-STD-100051 - Blue book	
Responsibility for this document:	The functional responsibility for the development, review and maintenance of this document rests with the Senior Vice President HSSE.

Contents

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1 Purpose and Scope

This program outlines establishes the minimum requirements for the protection of employees working on systems, machines, or equipment, where the unexpected energizing, start-up, or release of stored energy could cause injury. It shall be used to ensure that the system, machine, or equipment is isolated from all potentially hazardous energy sources and locked and tagged out prior to employees or subcontractors beginning work in the affected areas. This program also applies to work performed at or near deenergized electrical equipment and circuits.

This program applies to all Wood Environment & Infrastructure Solutions (E&IS) operations (including construction) that involve maintenance and servicing of machines and equipment in which the unexpected energizing or start-up of the machines or equipment, or release of stored energy could cause injury to employees or damage to property or equipment. The provisions of this Program shall be implemented prior to working on equipment containing or having the potential to contain hazardous energy sources.

This program is to be used at work locations where the client does not have a lockout/tagout program. If a client program is available, it will be used provided it is as restrictive as this Program. For operations conducted at locations controlled by another employer, that employer's program may be followed if all requirements outlined in this Program are met or exceeded.

Although this Program does not apply to the employees of a local utility company or other responsible entity, when a local utility company or other entity locates lines within an E&IS work area, E&IS employees will complete any actions required by this Program that have not been performed by the utility or other entity.

The requirements of this Program do not apply to the following:

- Hot tap operations involving transmission and Work on cord- and plug-connected electrical equipment that, when unplugged, contains no stored energy and cannot be unexpectedly energized or started up, provided the employee working on the equipment always has exclusive control of the plug.
- Work performed by journeyed electricians on, near, or with conductors or equipment in electrical installations that are covered by the specific requirements of 29 CFR 1910 Subpart S.
- Equipment and facilities that are under the exclusive control of electrical utilities, including related equipment for communication, control, or metering.
- Routine operations, such as tool adjustments, provided the operation is repetitive and integral to use of the item, and hazards have been mitigated.
- Calibration of energized equipment when the equipment must be energized to be calibrated.
- distribution systems containing gas, steam, water, or petroleum products when they are performed on pressurized pipelines, provided that it is demonstrated that:
    - Continuity of service is essential;
    - Shutdown of the system is unpractical;
    - Documented procedures are followed;

- Special equipment is used that will provide proven, effective protection for the employees; and
- Hot tap operations are only performed by those personnel with appropriate training and experience in the safe performance of hot tap operations.

2 Responsibilities

2.1 Senior Vice President of Health, Safety, Security and Environment

The Senior Vice President (SVP) of Health, Safety, Security and Environment (SVP of HSSE), or his designee, is responsible for conducting a periodic inspection at least annually to ensure that the procedure and the requirements of 29 CFR 1910.147 are being followed.

2.2 Group Health, Safety, Security & Environment Manager

The Group HSSE Manager is responsible for providing aid in the development and implementation of this as well as site-specific procedures within his/her Group.

2.3 Office Manager/Project Manager

The Office Manager (OM)/Project Manager (PM) will ensure that employees and subcontractors hired to perform work on a system, machine, or equipment capable of releasing stored energy are knowledgeable in safe lockout/tagout procedures. In addition, the OM/PM shall have the following responsibilities:

- Ensuring that specific written procedures for locking/tagging out specific equipment operated by employees working at sites that they manage are developed, made available to appropriate personnel, and updated as necessary (See Hazardous Energy Control Identification Worksheet HSE-FOR-100387, and Energy Control Procedure Permit HSE-FOR-100388).
- Informing the site owner/operator of E&IS' lockout/tagout Program, as necessary.
- Ensuring that work planning includes resources and time for lockout/tagout activities.
- Ensuring that requirements flow down to contractors through the contract.
- Ensuring locks and tags are available before they are expected to be needed.
- Ensuring that affected non-authorized employees receive awareness-level training, as appropriate.

2.4 Site Manager

The SM is responsible for:

- Ensuring all authorized employees are trained in accordance with 29 CFR 1910.147, The Control of Hazardous Energy (Lockout/Tagout), and Section 3.0 of this procedure
- Identifying all work activities requiring the isolation and lockout/tagout of hazardous energy sources
- Coordination with the facility point-of-contact to ensure notification of all affected employees

- Issuing the locks and tags to authorized employees and documenting on the Lockout/Tagout Log HSE-FOR-100386
- Developing equipment specific lockout/tagout procedures if none are available

2.5 Office HSSE Coordinator

Provide support, as needed, to ensure implementation of this Program.

2.6 Site Health and Safety Officer

The Site Health and Safety Officer (SHSO) is responsible for implementing and enforcing this procedure, under the guidance of the Corporate VP of HSSE or Group HSSE Manager during project operations and activities. The SHSO is also responsible for documenting implemented procedures. Copies of Lockout/Tagout Logs will be maintained on file by the SHSO.

2.7 Subcontractors

Subcontractor employees involved with the installation, repair, or demolition of a system, machine, or equipment that can store hazardous energy will either accept, or abide by, this SOP or their employer will provide an established written lockout/tagout procedure to E&IS for review.

The subcontractor will provide employees trained in the hazards of uncontrolled energy sources and the measures that must be taken to control the hazards (lockout/tagout). Subcontractors will provide their own tags and/or locks for usage for tasks under their control.

3 Procedure

3.1 Written Equipment Specific Lockout/Tagout Procedures

3.1.1 Initial Evaluation

An initial evaluation of each piece of machinery, equipment or process where E&IS employees will be performing servicing and maintenance activities, must be performed and shall identify potential exposures that must be isolated for maintenance, adjustment or servicing activities, or before certain operational activities can be performed. Several potential exposures requiring isolation before work can begin include, but are not limited to:

- **Electrical hazar**ds: direct contact with energized circuits or the unexpected electrical activation of machinery or processes.
- **Mechanical hazards**: exposure to moving machinery or components such as gears, levers, conveyers, fan blades, presses, saws, drills, pump shafts and couplings, etc. The power source(s) for machinery may be electric motors, gasoline or diesel engines, gases or steam, etc.
- **Pressure hazards**: direct contact with pressurized gases or liquids that may be released from tanks, pipes, valves, etc.
- **Thermal energy**: contact with steam systems, furnaces, open flames, burners, heaters, extremely cold liquids or gases, etc.

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- **Stored energy hazards**: contact with electrical batteries, pressurized gas or liquids in tanks or pipes (pneumatic, hydraulic, etc.), mechanical springs or gravity systems, heat storage devices, etc.
- **Hazardous agents or chemicals**: contact with or exposure to hazardous agents or chemicals.
- The Hazardous Energy Control Identification worksheet HSE-FOR-100387 that can be used during this process.

3.1.2 Specific Detailed Written Procedures

Each operation shall develop specific, detailed written procedures for locking/tagging out the equipment and processes identified during the evaluation except if **all** of the following elements exist:

1. The machine or equipment has no potential for stored or residual energy or re-accumulation of stored energy after shut down which could endanger employees.
2. The machine or equipment has a single energy source which can be readily identified and isolated.
3. The isolation and locking out of that energy source will completely de-energize and deactivate the machine or equipment.
4. The machine or equipment is isolated from that energy source and locked out during servicing or maintenance.
5. A single lockout device will achieve a locked-out condition.
6. The lockout device is under the exclusive control of the authorized employee performing the servicing or maintenance.
7. The servicing or maintenance does not create hazards for other employees.
8. The employer, in utilizing this exception, has had no accidents involving the unexpected activation or re-energizing of the machine or equipment during servicing or maintenance.

These written procedures are a supplement to this Program and affected employees will be notified of the location of the specific lockout/tagout procedures. Copies of the procedures to be used at project sites shall also be attached to the site-specific health and safety plan (HASP) or other project health and safety documents. Under no circumstances will any work be done on equipment without the development/availability of equipment specific lockout/tagout procedures.

Refer to the Example Energy Control Procedure-Permit HSE-FOR-100388 that can be used as a guideline.

3.2 Control Devices

The authorized employee will obtain a lock and tag from the SHSO or subcontractor supervisor. This issuance will be documented by the SHSO by making an entry on the Lockout/Tagout Log HSE-FOR-100386, or the subcontractor on a similar log.

A lock and tag shall be placed on each energy-isolating device used to de-energize an energy source (e.g., circuit and equipment), except as provided in Section 3.2.3 and/or Section 3.2.4 below. When more than

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one worker will be working on a piece of equipment, group lockout devices shall be used. One qualified worker will be assigned overall responsibility for the group lockout.

3.2.1 Locks

All locks used for lockout devices shall be substantial enough to prevent removal without the use of excessive force and shall be distinctive in color. The locks shall not be used for any other purpose.

3.2.2 Tags

Tags shall be constructed and printed so that exposure to weather conditions will not cause the tag to deteriorate or the message to become illegible. All tags shall have a standard message. The tag attachment means shall be non-reusable, attachable by hand, self-locking, and non-releasable with a minimum unlocking strength of not less than 50 pounds. Tag attachments shall be at least equivalent to a one-piece, all-weather tolerant nylon cable tie.

When any employee(s) attaches a lock and tag or tag alone, the employee(s) must note on each tag:

- Employee name or names
- Date the tag was attached
- The reason the tag was attached (e.g., repair, maintenance, etc.)
- The name of the equipment locked or tagged out

Tagout devices, where used, shall be affixed in such a manner as will clearly indicate that the operation or movement or energy isolating devices from the safe or off position.

Where Tagout devices are used with energy isolating devices designed with the capability of being locked, the tag attachment shall be fastened at the same point at which the lock would have been attached.

Where a tag cannot be affixed directly to the energy isolating device, the tag shall be located as close as safely as possible to the device in a position that will be immediately obvious to anyone attempting to operate the device.

3.2.3 Locks without Tags

A lock may be placed without a tag only under all of the following conditions:

- Only one circuit or piece of equipment is de-energized
- The lockout period does not extend beyond the work shift
- Employees or subcontractors exposed to the hazards associated with re-energizing the circuit or equipment are familiar with this procedure

3.2.4 Tags without Locks

When machinery, equipment, or systems **can** be locked out, they must be locked out when they are serviced, maintained, or modified.

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If machinery, equipment, or systems cannot be locked out, they must be tagged out with a level of safety equivalent to that of a lock, such as removing an isolating-circuit element or blocking a controlling switch.

Tags must be securely attached to energy isolating devices so that they cannot be inadvertently or accidentally detached during use.

Tags are subject to the same restrictions as locks for application and removal.

3.2.5 Blinds that Accept Lockout Devices

All blind flanges or slip blinds installed to isolate equipment or systems during construction, maintenance, and repair or servicing shall have provision for the attachment of a tagout device.

3.2.6 New Equipment Must Accept Lockout Devices

Whenever a machine or equipment is replaced or undergoes a major repair or modification or whenever new equipment is purchased, energy isolation devices for that machine or equipment shall be designed to accept a lockout device.

3.3 Lockout/Tagout Procedure

Prior to the start of a project, the SHSO and the SM (or designee, or subcontractor supervisor) shall survey the work areas to identify activities that require the isolation of a system, machine, or equipment. Prior to the deactivation of a system, machine, or equipment, the SM shall notify the facility point-of-contact and all affected employees. If work is to be conducted at an E&IS facility, the HSSE Coordinator and the Office Manager will be responsible for surveying the work area and notify affected employees.

Lockout/Tagout procedures are to be strictly adhered to when isolation of equipment is necessary to protect workers performing maintenance, repairs or servicing against injury resulting from unexpected energizing or release of hazardous agents.

The lockout/tagout operation and removal of lockout/tagout devices prior to placing equipment or systems back in normal operation shall be carried out in the order of steps set forth below and following the Lockout/Tagout procedures developed specific to each piece of equipment.

The specific written procedures developed must provide a specific statement of the purpose of the procedure (e.g., access pulley system for service or repair), and specific instructions in how to complete all of the applicable elements described below. For example, the specific written procedures must:

- Identify the type(s) of energy systems determined
- Provide specific instructions in how to turn off or shut down the system
- Provide specific instructions in locating and isolating the energy isolating devices for the specific lockout/tagout procedure

3.3.1 General Shut Down and Isolation Procedures

The following are general procedures for shutting down, locking out, testing and starting up equipment. These procedures should be used as a guide when developing the equipment specific procedures. ***These***

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procedures alone are not specific enough to comply with OSHA requirements. Refer to the Example Equipment Specific Energy Control Procedure-Permit HSE-FOR-100388

1. Determine all of the type(s) of energy the system uses. NOTE: The word "system" as used here applies to all equipment, machinery, or systems.
2. Tell the SM, SHSO or if in the office, the Office Manager and the HSSE Coordinator, what machinery, equipment, or system will be locked and tagged, and what related machinery, equipment, and systems will be affected by the lockout/tagout action.
3. Notify all employees who may be affected that the system will be out of service and locked/tagged out, and the reason for lockout/tagout.
4. Turn off or shut down the system.
5. Isolate the machinery, equipment, or system from the energy source(s).
6. Apply lock(s) and tag(s), ensuring only one key per lock exists and that key remains in his or her control until the lock is removed.
7. Relieve or restrain stored hazardous energy, such as energy in capacitors, springs, elevated machine members, rotating flywheels, and hydraulic systems, by shorting, repositioning, blocking, bleeding, or other appropriate action.
8. Verify that the machinery, equipment, or system is inoperable by using normal operating controls to attempt to start it. Make sure no one is in a location where equipment start-up or other release of hazardous energy may adversely affect him or her.
9. When there is a possibility that there could be a re-accumulation of stored energy that could rise to a hazardous level, verification of isolation will be continued until the work on the equipment is completed, or until the possibility of such accumulation no longer exists.
10. Perform any other tests to ensure that isolation has been achieved and stored hazardous energy is relieved, and return all operating controls to the neutral or “off” position.
11. Fill out a lockout/tagout form and give it to the SHSO or office HSSE Coordinator as soon as possible.
12. Necessary maintenance or service of the system may now be performed.

3.3.2 Removal of Locks and Tags, and Placing System Back in Service

Only authorized workers may remove locks and tags. Workers shall remove only locks and tags that they placed, unless the SM/Office Manager or SHSO/HSSE Coordinator directs them to remove locks and tags applied by others. This should be the exception, not the rule (see Section 3.3.5).

Locks and tags are removed using the following steps:

1. Check the machinery, equipment, or system and the immediate area to ensure that nonessential items have been removed and that the machinery, equipment, or system is read for safe operation.
2. Check the work area to ensure that all employees are safely positioned or removed from the area.

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3. Verify that the controls are all in the neutral or "off" position.
4. Replace any guards removed for lockout.
5. Remove locks and tags.
6. Reenergize the machine, equipment, or system.
7. Check the machine, equipment, or system to ensure it can be operated safely.
8. Notify the SM/Office Manager that the lock(s) and tag(s) have been removed and the item(s) is back in service. The SM/Office Manager will fill in the "Date item was returned to service" on the Lockout/Tagout Form.
9. Notify other employees that the system or machine is back in service again.

3.3.3 Temporary Lock Removal (For Testing or Positioning Equipment)

The procedures in this paragraph apply only to situations where lockout/tagout devices must be temporarily removed from the energy isolating device(s) so that the machine or equipment may be tested or positioned.

1. Clear the machine or equipment of tools and materials.
2. Make sure all employees are a safe distance from the equipment or system.
3. Notify affected and authorized employees that lockout/tagout devices are about to be removed.
4. Remove lockout/tagout devices.
5. Energize and proceed with testing or positioning.
6. De-energize all systems and reapply energy control measures to continue servicing and/or maintaining the machine or equipment.

3.3.4 Specific Requirements Concerning Valves

More than almost all other energy isolation devices, valves have a tendency to leak. For this reason, a single closed and locked/tagged valve should not normally be relied on as a secure means of energy isolation where failure of the valve might result in hazard to personnel. Instead, when energy isolation is carried out on hazardous energy sources controlled by valves, use one of the following methods or another equally effective method:

1. Use a blank flange, a slip blind system, or other device that securely blocks the line, duct, or pipe.
2. Double block and bleed. "Double block and bleed" means the closure of a line, duct, or pipe by closing and locking/tagging two in-line valves and by opening and locking/tagging a drain or vent valve in the line between the two closed valves.

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3.3.5 Removal of Lockout/Tagout Devices by Other Employees

It is an E&IS, and OSHA requirement, that each lockout or tagout device shall only be removed by the person who applied the device. There may be circumstances, however, that necessitate the removal of the lockout or tagout device by another individual, such as when the authorized employee who applied the lockout or tagout device is not available to remove it. The removal of another's lock or tag shall only be conducted if there is no other option (e.g., the employee is ill, has been terminated or is otherwise unable to return to work to remove the lock or tag). If this occurs, the lockout/tagout device may then only be removed under the direction of the Office Manager, PM, SM, or their designee, provided that the following procedures are followed:

- The Office Manager, PM, SM, or their designee will verify that the authorized employee who applied the device is not at the office or site.
- The Office Manager, Project Manager, or their designee will make every effort to contact that employee and have them return to the facility/site to remove their lockout or tagout device. If it is not possible to locate the employee or it is not feasible for the employee to return, notify the employee that their lockout or tagout device will be removed in their absence.
- The Office Manager, PM, SM, or their designee and a member of the crew who was working on the equipment in question may then remove the lock after determining that it is safe to do so. All such instances must be documented and reported to the SHSO/HSSE Coordinator.
- The Office Manager, PM, SM, or their designee should try to obtain the key, if possible. (If not possible, insulated bolt cutters will be used.)
- The employee removing the lock shall review surrounding equipment and schematics to make sure related components are understood.
- The steps outlined in Section 3.3.2 shall be followed for the removal of the lockout or tagout device and the re-energizing of the equipment.
- The Office Manager, PM, SM, or their designee shall verify that the authorized employee has been made aware that their lockout or tagout device has been removed before he/she resumes work at that facility.

3.3.6 Coordination with Other Employers

When more than one crew, craft department, or group is involved, a designated Authorized Employee shall be assigned overall job-associated lockout/tagout responsibility. This Authorized Employee shall coordinate all affected workforces and ensure continuity of protection.

Using Another Employer's Procedures - In cases where a client or other employer's lockout/tagout procedures will be followed, E&IS employees shall receive training in the specific lockout/tagout procedures prior to the start of those activities.

Informing Other Employers - At multi-employer work sites E&IS will ensure that the other employers involved or affected by use of E&IS lockout/tagout procedures are informed of the procedures contained in this Program as well as the equipment specific lockout or tagout procedures developed for the affected equipment.

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Company Employees Affected by Other Employer Procedures - In circumstances where E&IS employees may be affected by lockout/tagout procedures used by other employers, the Office Manager or PM shall ensure that information about these procedures is obtained from other employers using lockout/tagout. The Office Manager or PM shall ensure that this information is provided to employees potentially affected by the use of these procedures.

3.3.7 Periodic Inspections

All specific, detailed, written energy control procedures developed as required by Section 3.1.2 of this Program **and** in use for a period of one year or more, shall be subject to periodic inspection at least annually to ensure that the procedure and the requirements of this Program are being followed (See Certification of Lockout Review HSE-PRO-100389).

The periodic inspection shall be conducted to correct any deviations or inadequacies identified and shall be conducted by an Authorized Employee other than the one(s) utilizing the energy control procedure being inspected.

The HSSE Coordinator/SHSO shall certify in writing (Refer to Certification of Lockout Review HSE-PRO-100389) that the periodic inspection(s) have been performed. The certification shall include:

- The machine or equipment on which the lockout/tagout was being performed
- The date of the inspection
- The employees included in the inspection
- The person performing the inspection
- If any deficiencies are noted, these shall also be listed along with the corrective action taken and the date the corrective action was implemented

Certifications and documentation of any corrective actions shall be attached to the master copy of the procedure that was reviewed and retained for a period of not less than one full calendar year from the date of review.

4 Training and Awareness

Each affected and authorized employee or subcontractor shall receive training.

4.1 Affected Employees

Affected Employees shall be trained in:

- The purpose and use of the energy control procedures; and,
- The prohibition relating to attempts to restart or reenergize machines or equipment locked/tagged out.

4.2 Authorized Employees

Authorized Employees shall be trained in:

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- The recognition of hazardous energy sources, and in the type and magnitude of the energy available in the work place
- The lockout/tagout procedures as described in this Program
- The specific procedures developed for the specific system or equipment for which they will need to perform lockout/tagout
- The limitations of tags including:
    - Tags are warning devices and do not provide the physical restraint that is provided by a lock
    - Tags must not be removed from equipment without authorization from the person named on the tag
    - Tags and their means of attachment must be made of materials that will be able to withstand the environmental conditions encountered in the workplace
    - Tags should never be bypassed, ignored or otherwise defeated
    - Tags must be securely attached to energy isolating devices to prevent accidental removal

4.3 Requirement for Retraining

Significant Change - Retraining shall be provided to Affected or Authorized employees whenever there is a change in their job assignment that affects their roles or responsibilities relating to lockout/tagout, a change in machines or equipment, or when there is a change in procedures.

Performance Issues - Additional retraining shall be provided at the discretion of the HSSE Coordinator whenever they have reason to believe that the procedures described in this Program are not being followed. Such retraining needs may be indicated as a result of periodic inspections described at Section 3.3.7 of this Program.

Retraining Outcome - Retraining shall re-establish employee proficiency in these procedures.

5 Records

5.1 Documentation of Training

Lockout/tagout training or retraining is to be documented in a manner that clearly demonstrates the level of training completed (i.e., Affected or Authorized Employee), the date training was completed, and who provided the training. Hard copies will be maintained locally by the HSSE Coordinator or SSHO. Training shall also be documented in the HSSE online Safety Training System Database.

5.2 Lockout/Tagout Logs

Lockout/Tagout Logs HSE-FOR-100386 will be maintained by the SHSO or subcontractor supervisor. Records of training and annual program inspections will be maintained in the project, office, or contract files.

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6 Definitions

The following terms are used within this document.

Term	Definition
Affected Employee	Employees (including subcontractors) whose jobs require them to operate or use systems, machinery, or equipment that is being serviced or maintained or whose jobs require them to work in areas where service or maintenance is being performed.
Authorized Employee	A person who locks out and/or tags out systems, machinery, or equipment in order to perform service or maintenance on that system, machine, or equipment and has been properly trained in the control of hazardous energy sources.
Energy isolating device	A mechanical device that physically prevents the transmission or release of energy including, but not limited to the following: A manually operated circuit breaker; a disconnect switch; a manually operated switch by which the conductors of a circuit can be disconnected from all ungrounded supply conductors, and in addition, no pole can be operated independently; a line valve; a block; and any similar device used to block or isolate energy. Push buttons, selector switches and other control circuit type devices are not energy isolating devices.
E&IS	Wood Environment & Infrastructure Solutions
Energy Source	Any source of electrical, pneumatic, chemical, thermal, or other energy.
HSSE	Health, Safety, Security and Environment
Hot Tap	A procedure used in the repair, maintenance and services activities which involves welding on a piece of equipment (pipelines, vessels or tanks) under pressure, in order to install connections or appurtenances. It is commonly used to replace or add sections of pipeline without the interruption of service for air, gas, water, steam, and petrochemical distribution systems.
Lockout	The placement of a lockout device on an energy isolating device, ensuring that the equipment being controlled cannot be operated until the lockout device is removed.
Lockout Device	A device that utilizes a positive means (e.g., lock, either key or combination type) to hold an energy isolating device in a safe position and prevent the energizing of a machine or equipment.
OSHA	Occupational Safety and Health Administration (US)
PM	Project Manager
PPE	Personal protective equipment

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Term	Definition
Qualified Person (Qualified Employee)	A person who can demonstrate by experience or training the ability to recognize potentially hazardous energy and its potential impact on workplace conditions and who has the knowledge to implement adequate methods and means for control and isolation of such energy; a qualified person shall also be trained and certified competent in: • Skills and techniques necessary to distinguish exposed live parts from other parts of electric equipment • Skills and techniques necessary to determine the nominal voltage of exposed live parts • Minimum approach distances specified in Occupational Safety and Health Administration (OSHA) 29 CFR 1910.269, *Electrical Power Generation, Transmission, and Distribution*, corresponding to the voltages to which the qualified employee will be exposed • Proper use of special precautionary techniques, personal protective equipment (PPE), insulating and shielding materials, and insulated tools for working on or near exposed energized parts of electric equipment
Qualified electrical worker	Means an electrical worker who has been trained in accordance with 29 CFR 1910.331 through 1910.335 and 1910.269, and similar parts of 29 CFR 1926.
Servicing and/or Maintenance	Workplace activities such as constructing, installing, setting up, adjusting, inspecting, modifying, or maintaining and/or servicing machines or equipment. These activities include lubricating, cleaning, or un-jamming of machines or equipment and making adjustments or tool changes.
SHSO	Site Health and Safety Officer
SM	Site Manager
Tagout	The placement of a tagout warning device to indicate that the energy isolating device and the equipment being controlled may not be operated until the tagout device is removed.
Tagout Device	A prominent warning device or tag capable of being securely attached to an energy isolating device when it is placed in the "safe position" that identifies the applier or authority who has control of the energy control procedure and contains information, instructions, or both to prevent the operation of an energy isolating device.
OM	Office Manager
Unqualified worker	A person who has only received awareness-level training in the lockout/tagout Program

Term	Definition
SVP	Senior Vice President

7 References

Document type	Document title	Document no.
Form	Lockout/Tagout Log	HSE-FOR-100386
Form	Hazardous Energy Control Identification Worksheet	HSE-FOR-100387
Form	Energy Control Procedure-Permit	HSE-FOR-100388
Form	Certification of Lockout/Tagout Procedure Periodic Inspection Form	HSE-FOR-100389
Website	29 CFR 1910 Subpart S	
Procedure	US - Arc Flash NFPA 70E Procedure	HSE-PRO-100290
Procedure	US – Electrical Safety Procedure	HSE-PRO-100289
Standard	Life Saving Rule: Energy Isolations	HSE-STD-100022

8 Revision History

Revision no.	Revision date	Summary of changes
0	29-Mar-2021	Reformatted into new template. Company name change.

9 Appendices

None

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Appendix D: WSP-SA-208 Fall Prevention Protection and Rescue Planning

Fall Prevention, Protection and Rescue Planning

1 PURPOSE

All employees who are subject to fall hazards must be provided with guidance and training on fall hazards and means for protecting against such hazards.

2 SCOPE

This procedure applies to all WSP employees.

- Employee Level 1 – Hazard awareness
- Employee Level 2 – Active use of fall protection systems

2.1 Manage as Part of a Contract:

Employees are either Level 1 or Level 2. The Project Manager (PM) must be aware of the types of fall prevention and protection systems being used by the contractor. Safe access and safe systems are required for employees to perform inspections. All employees will observe a fall prevention mindset first. This means that fall exposures will be mitigated by not placing oneself at risk of a potential fall without the use of barriers or guardrails first. Should fall prevention not be available, fall protection (PPE) will be provided and must be used. All employees using fall protection systems must be aware of the limitations of the systems being used. The contractor providing secure anchorages or other lifeline systems must provide guidance and information on the systems and limitations of those systems being used. The contractor must have a competent person on the site trained in fall protection systems being used on the project.

2.2 At-Risk Work:

A fall protection plan must be submitted by each contractor performing work that has exposures to falls (work with elevation changes of 6 feet or more or where there is the potential for harm to workers at less than 6 feet) on the site. Each contractor is responsible for their fall protection systems and inspection. The contractor must have a competent person trained in fall protection on the site. The systems are to be installed under the guidance of a qualified person. Work requiring fall protection systems must be discussed prior to the work commencing, i.e. during pre-installation meetings, preconstruction meetings, or during weekly contractor meetings.

3 PROCEDURE

All employees performing work where there is exposure to a fall hazard shall follow this safety procedure. The PM shall instruct all affected employees in the procedures for:

- Eliminating fall exposures first mentality – work after fall prevention is in place. Fall protection (PPE) is the last provision for performing work.
- Identifying when fall protection is required
- Using the type of fall protection equipment provided
- Assembling, maintaining, inspecting and disassembling the fall protection system to be used
- Handling, storing and securing tools and materials
- Removing injured workers promptly and safely
- The company shall provide its employees with fall protection appropriate to the job.

3.1 Definition – "Fall hazard" is considered to be any change in elevation greater than or equal to six (6) feet, or an elevation change (can be less than 6 feet) where a fall would result in falling onto or into a hazard.

- General Industry action level for fall protection is four (4) feet.
- Construction Industry action level for fall protection is six (6) feet.

3.2 Project Planning:

- The PM shall identify the initial safety requirements and training needs during the RFP phase.
- Review Appendix A to SA 208 for fall protection planning and rescue requirements.
- The PM shall coordinate the fall protection requirements with the SM or SSM and where available, the contractors connecting devices, while writing the PSP (see SA 204, "Project Safety Plans").
- The SM or SSM shall review the PSP and identify training needs. Training modules in My Learning Portal will be recommended for employee and PM action.
- The PM shall review project employee training records (My Learning Portal) and provide for any required training, either in person or through online training. The SM or SSM can provide training on site or provide assistance where required. Project site training must be documented when provided by others.
- The PM shall provide PPE in accordance with the PSP or site requirements.

- The PM shall monitor and review the PSP to ensure adequacy and employee conformance.
- No employee should use fall protection equipment, systems or anchorages without having knowledge of the systems being used on a project site.

3.3 Level 1 Employee Training:

Employees that work out of the office and are exposed to potential fall hazards must be provided general hazard awareness training commensurate to the fall exposures. Employees are not allowed to don fall protection equipment at a Level 1. Employees should always maintain at least 10 feet back from any leading edge.

My Learning Portal has general hazard awareness training that can be recommended for employee exposure. Contact the SM or SSM for additional information on training.

3.4 Level 2 Employee Training:

If a job requires employees to be exposed to fall hazards, the affected employees shall be trained in the following procedures prior to the commencement of the job:

- The use of the fall protection and rescue work plan
- The identification of fall hazards and rescue options
- The use of fall protection systems including manufacture's guidance
- The procedures for handling, storing, and securing tools and materials
- The removal of injured workers

A record of employee training shall be maintained in the project files and/or through My Learning Portal.

4 RECORDS

The following records shall be maintained by the PM or OSC in the project files in accordance with AD 305, "Records Management Manual":

- Employee fall protection training records, including sign-in sheets
- Project Safety Plan (per SA 204) found in RMIS

Online hazard awareness training records shall be kept electronically within the WSP online training database.

5 REFERENCES

- SA 208, Appendix A, “Fall Protection and Rescue Planning”
- SA 204, ”Project Safety Plans”
- AD 305, "Records Management Manual"

6 FORMS

- SA 208-01, Fall Arrest Rescue Plan (Self Rescue)
- SA 208-02, Fall Arrest Rescue Plan (Assisted Rescue)
- SA 208-03, Fall Arrest Rescue Plan (Professional Rescue)

Revision History:

Rev	Date	Description	Reviewed by:	Approved by:
0	03/07	Initial Issue	EPD	MAW
1	02/09	Revised to incorporate suggested improvements and clarity	EPD	GJP
2	10/09	All occurrences of “LBE” replaced with “AM”	EPD	GJP
3	11/11	Revised due to organizational changes and to correct acronyms	EPD	GJP
4	07/13	Organization changes and modifications for clarification	EPD	GAK
5	05/16	Clarification, added rescue requirements and three forms	TET	EPD
6	09/17	Corrected to reflect company name change	TET	EPD

Appendix E: WSP-SA-303 Hazard Communication Planning

1.0 Purpose

The purpose of this written hazard communication program is to ensure that all WSP employees who may be exposed to hazardous chemicals on the job are aware of the chemical content, are trained on the hazards and are able to implement the appropriate measures for self-protection. This process will also provide guidance on the Global Harmonization Standard (GHS).

2.0 Scope

This program applies to all WSP USA employees.

3.0 State Right-to-Know

WSP recognizes both state specific regulations as well as Federal OSHA Right-to-Know laws concerning chemical hazards within the work place.

4.0 Exemptions

There are two types of exemptions from this program, and they are as follows:

The following materials or operations are exempt from the provisions of this Standard (1910.1200(b), 1926.59): (Partial listing)

- Any hazardous waste as such term is defined by the Solid Waste Disposal Act, as amended by the Resource Conservation and Recovery Act of 1976, as amended (42 U.S.C. 6901 et seq.), when subject to regulations issued under that Act by the Environmental Protection Agency
- Any consumer product or hazardous substance, as those terms are defined in the Consumer Product Safety Act (15 U.S.C. 2051 et seq.) and Federal Hazardous Substances Act (15 U.S.C. 1261 et seq.) respectively, where the employer can show that it is used in the workplace for the purpose intended by the chemical manufacturer or importer of the product, and the use results in a duration and frequency of exposure which is not greater than the range of exposures that could reasonably be experienced by consumers when used for the purpose intended
- Tobacco or tobacco products;
- Wood or wood products;
- Foods, drugs or cosmetics for personal consumption by employees in the work place.

When labeled in accordance with federal requirements, the following substances shall be exempt only from the labeling provisions of the Standard:

- Pesticides subject to EPA's Federal Insecticide, Fungicide and Rodenticide Act (FIFRA) labeling requirements:
- Food, drug or cosmetic material subject to labeling requirements of the Food and Drug Administration (FDA);
- Distilled spirits, wine or malt beverages subject to labeling requirements of the Treasury's Bureau of Alcohol, Tobacco and Firearms (BATF); and
- Consumer products subject to labeling requirements of the Consumer Products Safety Commission.

5.0 Hazard Assessment

Safety data sheets (SDS), formerly SDS, will be used to satisfy the requirements of 29 CFR 1910.1200 (d) hazard determination and classification. An SDS is equivalent to an MSDS for purposes of satisfying these requirements. See Appendix C for guidance on the sections of an SDS.

WSP will rely, in good faith, on the SDS received with all hazardous chemical shipments, or received soon thereafter in the case of missing or updated SDSs. The office safety coordinator (OSC) is charged with the responsibility of ensuring that the most current SDSs are posted in the master and work area SDS Binders. If new and significant information concerning the potential health hazard of a chemical in the work place is uncovered, then the office safety coordinator will ensure that either an updated SDS is obtained from the supplying source, or, in the event such SDS is not available, that the new information is added to the appropriate section of the existing SDS within two months of them being advised of the new information.

6.0 Chemical Inventory

The office safety coordinator will conduct an inventory in accordance with Section 4 of all chemicals and maintain a list within the work place by work area. From the appropriate SDS on each of these chemicals, they will take the necessary steps to ensure that the hazard information is included on each container unit. The office safety coordinator will also determine whether or not there are any missing SDSs, and that such, if any have been requested from the appropriate supplier. The complete inventory of all hazardous chemicals in the work place must become a part of the master and all work area SDS binders.

7.0 Safety Data Sheets (SDS)

The SDS is one of the mechanisms used to transmit required information on hazardous

chemicals to employees. This is accomplished by placing copies of the SDS for each hazardous chemical in the workplace into a binder. The number of binders will vary; however, there should be one master binder which should be located in the office of the office safety coordinator.

7.1 Acquiring the SDS:

The office safety coordinators are responsible for obtaining SDS on all hazardous substances entering the work place. The normal procedure for acquiring an SDS will be to request one from the supplier or going to the manufacturer's website.

The supplier has thirty (30) days in which to respond. A follow-up letter should be sent if the SDS is not received within the thirty (30) days period. This second request should be accompanied by a telephone call.

If the SDS is not received within ten (10) working days following this second request, a certified letter requesting the SDS should be sent to the supplier. Continued absence of the SDS within the ten (10) workings days following the certified letter should result in the filing of a written complaint with the nearest OSHA regional office. One other possibility is to seek an alternate supplier who can guarantee an immediate SDS.

Complete documentation must be maintained on all requests for a SDS, from the initial request on the purchase order through the letter of complaint with the appropriate regulatory agency, including all telephone calls.

8.0 Hazardous Material Identification

8.1 Labeling:

The labeling system is not intended to be the sole or the most complete source of information regarding the nature or identity of the hazardous chemicals within the work place. The identity of the chemical, as it is shown on the label, could be any term the company wishes to use, as long as it also appears on the SDS for the chemical, along with its precise chemical name.

8.2 Secondary Container Labeling:

The office managers shall assure that all secondary containers of hazardous materials be labeled with the appropriate identification and hazard warnings associated with the hazardous material. This can be accomplished by the use of the pictograms located in Appendix B.

9.0 Education and Training

WSP USA has online hazard awareness training for employees. Training will be provided at the

time of initial assignment and whenever a new hazardous chemical is introduced into the work area. Employees will be informed of operations in the work area where hazardous chemicals are present and where they can find the company's written hazard communication program, the list of hazardous chemicals (chemical inventory), the hazard determination procedure and the SDS. The training will include the following:

- Methods and observations that may be used to detect the presence or release of a hazardous chemical in the work place, including air sampling, personal monitoring, visual appearance, odor, etc.;
- The physical and health hazards in the work place;
- The measures employees can take to protect themselves from these hazards, including specific procedures implemented to protect their employees and contractors from exposure to hazardous chemicals and materials, such as appropriate work practices and engineering controls, emergency procedures, personal protective equipment to be used, etc.

10.0 Multi-Employer Worksite - 1910.1200(e)(2)

The PM is responsible for requesting information concerning the general contractors' haz com plan. Any contractor or subcontractor that uses, stores or produces a product or by-product that is a known hazardous chemical must inform all employees on the site about the hazards associated with the hazardous chemical.

11.0 Contractor Notification

The OSHA standard requires all contractual agreements with on-site sub-contractors to contain a notification advising the sub-contractor of this hazard communication program and requiring the sub-contractor and their employees who will be working at a facility or work site, to become familiar with the provisions of this program.

In the event the sub-contractor will be performing work in an area where hazardous chemicals are present, the sub-contractor must be given a verbal orientation on the program by the PM and instructed as to the location of the nearest SDS.

12.0 Chemical Use Plan

All operations and activities that involve the use of chemicals shall be planned in advance. At a minimum, the PSP and a chemical use plan shall be completed by the immediate supervisor responsible for a specific operation and/or activity. A copy shall be maintained in the office and made available upon request. No WSP offices are expected to be required to have a chemical use plan.

13.0 Responsible Party

WSP USA will comply with the provisions of this standard and will designate each manager and/or supervisor to be office safety coordinator for their department or worksite. The office safety coordinator or their designee will have the primary responsibility for all aspects of the hazard communication program. The office safety coordinator will be responsible for providing the hazard assessment based on the chemicals SDS, obtaining and providing additional information on the hazardous chemicals and identifying and providing appropriate emergency procedures if necessary.

14.0 References

- Hazard communication program is as described by 29 CFR 1910.1200(e), and 29 CFR 1926.59.
- OSHA has established a minimum number of chemicals which are considered hazardous and are covered by the standard. These are:
  - Chemicals listed by OSHA in 29 CFR 1910, Subpart Z, Toxic and Hazardous Substances;
  - Chemicals listed by ACGIH in Threshold Limit Values for Chemical Substances in the Work Environment;
  - Carcinogens listed by the IARC or NTP.
- Appendix A, GHS Labeling Requirements
- Appendix B, Pictograms GHS
- Appendix C, GHS SDS Sections

Appendix F: WSP-SA 202 Emergency Preparedness and Response

Emergency Preparedness and Response

1 PURPOSE

Emergency Response Plans (ERPs) are instrumental in minimizing any potentially adverse effects on WSP and its employees because of an unplanned event. If employees on a project encounter environmental issues not addressed in this procedure, WSP may opt to prepare a project-specific procedure for response.

Emergency preparedness also includes the response to accidents involving injury and illness in the workplace.

This plan should be coordinated with the local office business resumption plan.

2 PROCEDURE

A wide variety of emergencies may require the workplace to be evacuated. Both man-made and natural, these emergencies include – fires, explosions, floods, earthquakes, hurricanes, tornadoes, toxic material releases, radiological and biological accidents, civil disturbances and workplace violence. Potential office emergencies need to be anticipated and procedures for responding to them must be developed before the emergencies happen. Emergency planning is an ongoing process and must include training for designated responders and practice exercises for all employees.

Emergency Response Plan (ERP) – In addition to WSP's more general emergency procedures, each office or location where employees work shall prepare an ERP (See SA 208-01 A and B) based on location-specific conditions. Each location shall develop response plans to meet the types of incidents that might be encountered at that site. The plan must be coordinated with the local building management company where present. The ERP shall be designed to minimize the effects of an emergency and should be coordinated with the disaster recovery plan for the office. The ERP shall be reviewed annually by the Office Manager or Local Office Administrator or as needed based on location changes. The ERP shall be submitted annually for review to the Safety Team. An ERP shall include:

- Exit routes, meeting areas and procedures for accounting for personnel (including visitors)
- Emergency evacuation, incident command and notification to emergency services
- Responses to personal injury and property damage
- Bomb threats and facility security

- First-aid response
- Use of fire extinguishers
- Use of specific equipment or required personal protective equipment (PPE)
- If there is a building security program, list the protocols in the ERP
- Acts of God

Through careful pre-planning, the establishment of Emergency Response Teams (ERTs) and employee training and drills, employees can be reasonably safeguarded and the potential for damage to assets can be realistically minimized. ERTs shall be properly staffed with employees. The ERT members shall be adequately trained and periodically reviewed and drilled to allow them to become reasonably proficient in the execution of evacuation procedures.

First-aid kits or first-aid supplies - shall be available in all work locations, with adequately trained first-aid providers available for emergency assistance. These kits and/or supplies should be inspected monthly to ensure supplies are adequate for the office. Certified first responders names should be listed in close proximity to the first aid kit and/or AED machine. Copies of the first responder certificates should be kept with the LOA's copy of the ERP.

Fire Extinguishers – must be inspected annually and tagged to indicate the maintenance check was completed. The LOA or their designee should visually check all fire extinguishers monthly to ensure the equipment is in good working order. It is recommended that these checks be noted on the certificate tag attached to the equipment.

Medical Emergency Plan – An ambulance shall be requested in any case where an employee needs immediate emergency medical attention or in any other circumstance where the employee or other first-aid provider deems it necessary. The telephone number for such requests is "911" in most cities or counties (the emergency telephone listing for any particular area should be verified). Notification of the immediate family will be handled through local office management. A member of the emergency response team, supervisor or manager should accompany the employee to the doctor or hospital whenever possible. If an employee suffers a serious injury, the following procedure should be performed by workers in the area where the injured employee is located:

- Dial #911 (or other appropriate number) for an ambulance
- Promptly communicate with the first-aid trained employee in the area
- Administer first-aid and CPR until the ambulance/paramedics arrive. The first-aid/CPR/AED responder shall only administer first-aid to his or her level of proficiency.

- Secure the area to prevent further injury
- Notify the immediate manager and others as directed. The immediate manager shall designate someone to meet the ambulance and direct the responders to the location of the injured worker.
- A designated employee shall accompany the injured employee to the hospital while the local office contacts the appropriate family members.
- Avoid any disturbance of a site of a serious accident until a thorough accident investigation can be conducted. The immediate supervisor, working in conjunction with the AM, an emergency response team member, and facility management, will investigate and determine when work may resume in the area.

Plan Communication – **WSP** shall communicate its emergency procedures and emergency evacuation procedures to its employees by posting actions and responsibilities on the intranet and safety bulletin board. Evacuation routes/maps shall be posted in various locations throughout each office (in all areas and on all floors). The plan shall be periodically tested based on current requirements as established by state and local building management organizations.

Fire Drills – Each office will conduct **two drills annually (one prior to the last day of June)**. If a fire drill is conducted by the building manager, their schedule, if known, will be followed. If the building does not hold annual fire drills, the office will conduct their own drills. If the building conducts an evacuation fire drill (multi-floor or high rise building), the second drill will not include evacuation. Employees will muster at emergency exits and review the drill process as a second annual drill. Evacuation drills in high rise buildings must be coordinated with the building manager to ensure that there are no issues with employees evacuating during the proposed drill.

During a fire drill, anyone unable to negotiate the stairs should marshal at the closest stairwell, and will not be required to evacuate the building. One of the Handicap Aides or Wardens should remain with the employee(s) and inform them of the procedures to follow if there was an actual emergency.

The LOA should request that employee feedback from the drills be submitted through iSMS as an observation. The LOA shall also input an observation into iSMS following a drill and document the drill and any feedback that they have or receive. Feedback should include the number of participants including visitors. If the building or fire department provides feedback, that should be documented in iSMS with the observation.

Bodily Fluids - Because different types of bodily fluids are difficult or impossible to identify, all bodily fluids shall be considered as potentially infectious. An employee must therefore wear latex gloves at times while administering first-aid. A CPR mouthpiece must be used when performing CPR. Eye protection must be worn when responding to medical emergencies involving the release or potential release of bodily fluids. Any

employee exposed to blood or bodily fluids while performing first-aid or CPR on the job shall immediately contact the Human Resource Manager (HRM) or the local Human Resource Administrator (HRA) to arrange for immediate medical attention, including a vaccination, if needed. Refer to SA 202, Appendix A, "Bloodborne Pathogens and Biohazards Program," for additional details.

3 RECORDS

- ERPs, medical emergency plans and disaster/business resumption plans shall be maintained in the local office and available for review by all employees and visitors.
- Records of training on evacuation procedures within the office shall be kept by the LOA or local office management.
- Observations and feedback from Emergency Response Drills will be submitted through iSMS.

4 REFERENCES

- SA 202, Appendix A, "Bloodborne Pathogens and Biohazards Program"
- **SA 202, Appendix B, "Storm Warning Guidance"**
- **SA 202, Appendix C, "Pandemic Preparedness"**

5 FORMS

- SA 202-01A, "ERP Template"
- SA 202-01B, "Small Office ERP Template"

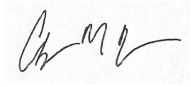
Revision History:

Rev	Date	Description	Reviewed by:	Approved by:
0	03/07	Initial Issue	EPD	MAW
1	02/09	Revised to incorporate suggested improvements and clarity	EPD	GJP
2	06/10	Revised to correct the name of the ERP	EPD	GJP
3	03/11	Revised to reflect organizational changes	EPD	GJP
4	11/11	Sections 3.2 and 4.1 revised	EPD	GJP

5	07/13	Reference to SA 202, Appendix A, "Bloodborne Pathogens and Biohazards Program" added; Section 4.1 revised; all references to "PB" changed to "Parsons Brinckerhoff"	EPD	GAK
6	04/14	Revised to clarify procedure	EPD	GAK
7	12/15	Changed company name to WSP | Parsons Brinckerhoff throughout	EPD	GAK
8	01/17	Modified fire drill requirements	EPD	TET
9	09/17	Updated to reflect company name change; added reference to SA 202-01A and B	EPD	TET
10	**02/19**	**Appendix B, Storm Warning Guidance, and Appendix C, Pandemic Preparedness added as references**	**EPD**	**TET**

Attachment A: Natural Disaster Preparedness and Response

TITLE: NATURAL DISASTER PREPAREDNESS AND RESPONSE

Effective Date:	6-19-2023	
Reviewed by:	Kevin P. Mishoe Field Operations Manager	 Kevin.Mishoe 2023.06.27 13:17:30 -04'00'
Reviewed by:	Marcus O. Stewart QA Manager	 Digitally signed by Marcus O. Stewart Date: 2023.06.19 14:35:49 -04'00'
Approved by:	Christopher M. Rogers Project Manager	 Digitally signed by Christopher.Rogers Date: 2023.06.27 13:38:32 -04'00'

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Annual Review			
Reviewed by:	Title:	Date:	Signature:

NATURAL DISASTER PREPAREDNESS AND RESPONSE

1.0 PURPOSE

The purpose of this procedure is to provide guidance for the management of Clean Air Status and Trends Network (CASTNET) remote monitoring sites in the event of natural disasters.

2.0 SCOPE

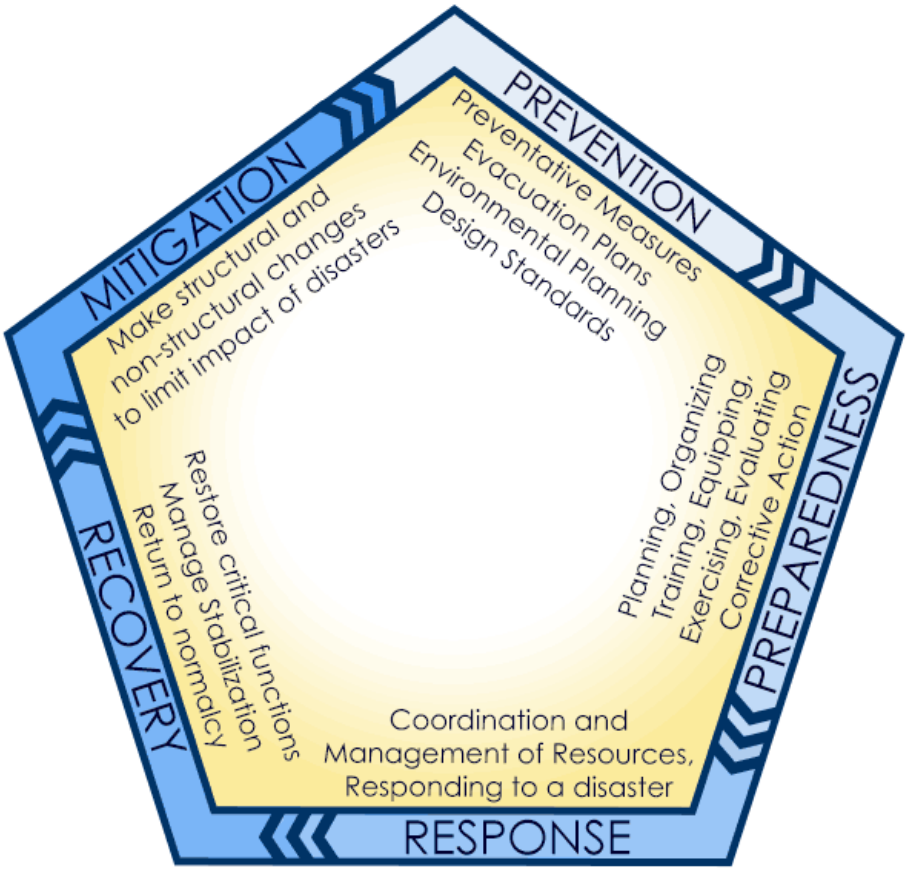
This procedure applies to all United States Environmental Protection Agency (EPA) sponsored CASTNET sites. In this document, natural disasters are defined as geological or meteorological events that pose potentially catastrophic risk. These types of disasters include:

- Severe Weather Events (e.g. Hurricanes, Tropical Storms, Tornadoes)
- Floods
- Wildfires
- Earthquakes

3.0 SUMMARY

The procedure is summarized in Figure 1 below:

Figure 1. Prevention, Preparedness, Response, Recovery and Mitigation



Source: Bexar County Office of Emergency Management

The steps depicted in Figure 1 will have varying degrees of effectiveness depending upon the type and severity of the event. For example, advance warning for an approaching storm may allow for emergency preparations ahead of any danger but such is not feasible for an earthquake.

4.0 ROLES AND RESPONSIBILITIES

Project Manager: The Project Manager will work with the EPA Project Officer or their designee to determine whether emergency action (i.e. non-routine action to address the situation) is warranted for an event. Approves action/recovery plans and assigns personnel.

Field Operations Manager: The Field Operations Manager is responsible for the assessment of onsite conditions relating to the event, reporting this assessment to the Project Manager, ensuring action/recovery plans are properly executed, and notifying the Laboratory Operations Manager when the action plan requires cessation of filter pack sampling operations.

Site Health and Safety Manager: The Site Health and Safety Manager is responsible for ensuring the site (including site personnel) is prepared according to the existing Health and Safety Plan.

Laboratory Operations Manager: The Laboratory Operations Manager is responsible for halting the preparation of preparing and shipping filter packs pursuant to notification received from the Field Operations Manager.

Project Team: The Project Team as a whole will, in their usual project roles, execute the action/recovery plan and ensure that normal operation is restored post-recovery.

5.0 PROCEDURES

The procedure for natural disaster preparedness and response is described in the following sections. Action/recovery plans will be event-dependent.

5.1 Prevention

Preventive measures are designed to provide limit risk from disasters. The risk to personnel and to the project is limited by the project Health and Safety Plan along with the disaster plan (this document) and proper design standards for remote monitoring stations (e.g. sites located in a designated and maintained clearing, lightning protection, installed permanent structures adhere to building code standards).

5.2 Preparedness

Preparedness focuses on readiness and generally consists of routinely evaluating the status of established prevention measures and taking corrective action for lack of adherence or if those measures are determined to be inadequate. CASTNET remote monitoring sites are visited each week by trained personnel who report site condition to project field operations technicians. Additionally, the stations and infrastructure are inspected by trained technicians during routine semi-annual inspection and servicing visits.

5.3 Response

Response is comprised of the coordination and management of resources and measures taken for life/property/environmental safety. The response phase is a reaction to the occurrence of a disaster or emergency. The response phase begins when the CASTNET Project Manager contacts the EPA Project Officer and they agree to the creation and implementation of an action/response plan. The action/response plan will address the following:

5.3.1 Potential severity of the event and the time available to work safely on site.

5.3.2 Securing site structures and equipment during this safe period. For example, if a tropical storm is approaching this may entail removing instruments from the monitoring tower, securing them within the shelter, and laying the tower down at the base.

5.3.3 Associated work schedules.

5.3.4 Resources, including budget, required to secure the site and to restore the site to normal operation during the recovery phase.

5.4 Recovery

Recovery consists of activities that restore functions. The goal of the recovery phase is to restore routine operation. The recovery phase begins after the threat to safety has subsided and recovery work at the site is feasible (e.g. roads are cleared, ground is sufficiently firm for vehicles or required reinstallation, etc.).

5.5 Mitigation

Mitigation involves measures taken to limit the impact of disasters and emergencies (e.g. raising building elevation in a flood prone area).

Figure 2. Elevated Monitoring Station – Beaufort, North Carolina

6.0 REFERENCES

1997 Uniform Building Code, Vol. 2: Structural Engineering Design Provisions

http://www.alumatower.com/towers-telescoping-mast-systems/10-meter-meteorological-tower/
Accessed October 4, 2022

7.0 APPENDICES

There are no appendices to this document.

8.0 ATTACHMENTS

There are no attachments to this document.