



Weston Solutions, Inc.
Suite 201
1090 King Georges Post Road
Edison, New Jersey 08837-3703
732-585-4400 • Fax 732-225-7037
www.westonsolutions.com

The Trusted Integrator for Sustainable Solutions

REMOVAL SUPPORT TEAM 2
EPA CONTRACT EP-W-06-072

September 9, 2013

Mr. Paul Kahn, On-Scene Coordinator
U.S. Environmental Protection Agency
Response & Prevention Branch
2890 Woodbridge Avenue
Edison, NJ 08837

EPA CONTRACT NO: EP-W-06-072

TDD NO: TO-0029-0085

DOCUMENT CONTROL NO: RST2-02-F-2529

**SUBJECT: SITE-SPECIFIC HEALTH AND SAFETY PLAN - SCOTT AUTO SALES
SITE, NORTHUMBERLAND, SARATOGA COUNTY, NEW YORK**

Dear Mr. Kahn,

Enclosed please find the Weston Solutions, Inc., Removal Support Team 2 (RST 2) Site-Specific Health and Safety Plan for the potable water sampling event to be conducted as part of the Removal Action at the Scott Auto Sales Site on September 18 and 19, 2013. If you have any questions, please do not hesitate to contact me at (732) 570-4997.

Sincerely,

Weston Solutions, Inc.

for Aleksandra Mallon
Removal Support Team 2
Site Project Manager

Enclosure

cc: TDD File No.: TO-0029-0085



**REGION II RST 2 HEALTH AND SAFETY PLAN
EMERGENCY RESPONSE/REMOVAL ACTION/REMOVAL ASSESSMENT
(Revised 16 March 2011)**

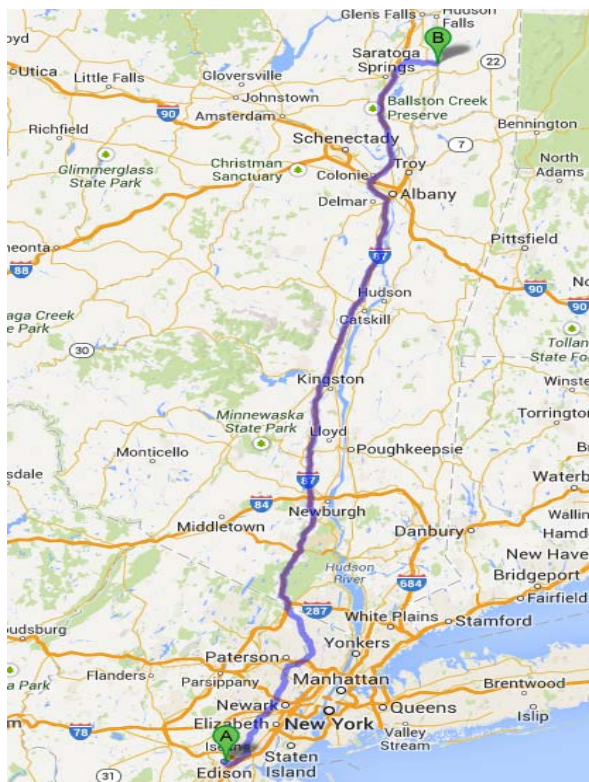
TDD No.: TO-0029-0085

Site Name: Scott Auto Sales

Site Address: Street No.: 4724 Route 50
City: Northumberland
County/State: Saratoga, New York

- | | |
|---|---------|
| 1. Head west toward King Georges Rd/King Georges Post Rd | 302 ft |
| 2. Turn right onto King Georges Rd/King Georges Post Rd | 1.8 mi |
| 3. Slight right onto the ramp to Garden State Pkwy | 0.4 mi |
| 4. Keep left at the fork, follow signs for Garden State Pkwy N and merge onto Garden State Pkwy | 33.9 mi |
| 5. Take exit 163 N on the left to merge onto NJ-17 N | 12.8 mi |
| 6. Take the New Jersey 17 N/Interstate 287 N exit toward Interstate 87/North Y. Thruway | 0.1 mi |
| 7. Keep left at the fork, follow signs for I-287 N/I-87/NJ-17 N/N Y. Thruway and merge onto I-287 N/NJ-17 N - Entering New York | 0.8 mi |
| 8. Keep left at the fork, follow signs for I-87 N/NY-17 N/Albany and merge onto I-87 N/NY-17 N - Continue to follow I-87 N | 118 mi |
| 9. Take exit 24 to merge onto I-87 N/I-90 E toward Albany/Montreal | 0.9 mi |
| 10. Take exit 1N to merge onto I-87 N toward Albany International Airport/Montreal | 30.6 mi |
| 11. Take exit 15 for New York 50 toward Saratoga Springs/Gansevoort | 0.3 mi |
| 12. Turn right onto NY-29 Truck E/NY-50 N - Continue to follow NY-50 N | |

Destination is 207 miles = 3 hours and 48 minutes



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Historical/Current Site Information:

The Scott Auto Sales Site (the Site) is a former automotive supply store and repair shop located at 4724 Route 50 in Northumberland, Saratoga County, New York. The Site is located in a semi-rural area amidst residential and light commercial properties and is bordered by County Highway Route 50 to the south and an unnamed brook to the north. There are private residences located to the east and west of the Site. The property consists of a main garage building and surrounding property which contained approximately 200 containers of automotive chemicals and waste oil. The Site is owned but has been abandoned by the owner.

On October 2, 2013, Weston Solutions, Inc., Removal Support Team 2 (RST 2) performed waste sampling and field characterization screening as part of a Removal Assessment of the Site.

In August 2013, the U.S. Environmental Protection Agency (EPA) and Emergency Rapid Response Services (ERRS) contractor, Kemron Environmental, mobilized to the Site to conduct a Removal Action. ERRS prepared the repair bays to be used as a staging area for the drums. ERRS posted signs, cleared vegetation surrounding the main building, installed new locks and secured numerous overhead doors with chains. On August 29, 2013, ERRS relocated 49 full drums of waste oil and automotive chemicals from areas on the Site to the repair bays. Approximately 300 gallons of waste oil were collected from storage tanks into poly drums and staged in the repair bays. In addition to the full drums, ERRS relocated 150 containers of chemicals, 5 gallons or less, into the staging area. A total of 35 empty metal/poly drums and aboveground storage tanks (ASTs) were staged at the rear of the main building pending arrangements for recycling. EPA created a floor plan sketch of the drum storage area and submitted a copy to the local Gansevoort Fire Department.

RST 2 Scope of Work:

RST 2 is tasked with the collection of potable water samples from several properties within the vicinity of the Site. Field activities will be conducted on September 18 and 19, 2013. Up to 12 potable water samples will be collected from up to 11 private wells from properties within a ¼ mile radius of the Site. EPA has identified 10 residential and one commercial property for the sampling event. Samples will be collected from taps when possible, prior to any water treatment and be submitted for target compound list (TCL) volatile organic compounds (VOCs), TCL semivolatile organic compounds (SVOCs), and target analyte list (TAL) metals analyses. The analytical data from this investigation will be used to assist the EPA in determining if there is a potential risk to human health from utilizing private drinking water wells.

Three (3) S.M.A.R.T. Health and Safety Goals for the Project (Simple, Measurable, Actionable, Reasonable, & Timely):

1. Safe driving practices, utilizing a spotter if necessary when backing out of the access road into oncoming traffic on the main road.
2. Awareness of surrounding areas and walking surfaces, minimizing slips, trips, and falls.
3. Monitor fatigue while working extended hour workdays.

Incident Type:

- ☐ Emergency Response
- ☐ Removal Assessment
- ☒ Removal Action: September 2013
- ☒ Residential Sampling/Investigation: September 2013
- ☐ PRP Oversight

Location Class:

- ☐ Industrial
- ☒ Commercial
- ☒ Urban/Residential
- ☐ Rural

U.S. EPA OSC: Paul Kahn

Original HASP: Yes

Lead RST 2: Aleksandra Mallon

Date of Initial Site Activities: 9/18/2013

Site Health & Safety Coordinator: Aleksandra Mallon

Site Health & Safety Alternate: Not Applicable

Response Activities/Dates of Response (fill in as applicable)

Emergency Response:

- ☐ Perimeter Recon.
- ☐ Site Entry
- ☐ Visual Documentation
- ☐ Multi-Media Sampling
- ☐ Decontamination

Removal Assessment:

- ☐ Perimeter Recon
- ☐ Site Entry
- ☐ Visual Documentation
- ☐ Multi-Media Sampling
- ☐ Decontamination

Removal Action:

- ☐ Perimeter Recon
- ☐ Site Entry
- ☒ Visual Documentation - September 18 and 19, 2013
- ☒ Multi-Media Sampling – September 18 and 19, 2013
- ☐ Decontamination

Physical Safety Hazards to Personnel

- | | | |
|---|---|--|
| <input checked="" type="checkbox"/> Inclement Weather – Attach FLD02 | <input checked="" type="checkbox"/> Heat – Attach FLD05 | <input checked="" type="checkbox"/> Cold – Attach FLD06 |
| <input type="checkbox"/> Confined Space – Attach FLD08 | <input type="checkbox"/> Industrial Trucks – Attach FLD09 | <input type="checkbox"/> Manual Lifting – Attach FLD10 |
| <input type="checkbox"/> Terrain – Attach FLD11 | <input type="checkbox"/> Structural Integrity – Attach FLD13 | <input type="checkbox"/> Site Security – Attach FLD14 |
| <input type="checkbox"/> Pressurized Containers, Systems – Attach FLD16 | <input type="checkbox"/> Use of Boats – Attach FLD18 | <input type="checkbox"/> Waterways – Attach FLD19 |
| <input type="checkbox"/> Explosives – Attach FLD21 | <input type="checkbox"/> Heavy Equipment – Attach FLD22 | <input type="checkbox"/> Aerial Lifts and Manlifts – Attach FLD24 |
| <input type="checkbox"/> Elevated Surfaces and Fall Protection – Attach FLD25 | <input type="checkbox"/> Ladders – Attach FLD26 | <input type="checkbox"/> Excavations/Trenching – Attach FLD28 |
| <input type="checkbox"/> Fire Prevention – Attach FLD31 | <input type="checkbox"/> Demolition – Attach FLD33 | <input type="checkbox"/> Underground/Overhead Utilities – Attach FLD34 |
| <input type="checkbox"/> Hand and Power Tools – Attach FLD38 | <input checked="" type="checkbox"/> Illumination – Attach FLD39 | <input type="checkbox"/> Storage Tanks – Attach FLD40 |
| <input type="checkbox"/> Lead Exposure – Attach FLD46 | <input checked="" type="checkbox"/> Sample Storage – Attach FLD49 | <input type="checkbox"/> Cadmium Exposure – Attach FLD50 |
| <input type="checkbox"/> Asbestos Exposure – Attach FLD52 | <input type="checkbox"/> Hexavalent Chromium Exposure – Attach FLD 53 | <input type="checkbox"/> Benzene Exposure – Attach FLD 54 |
| <input type="checkbox"/> Drilling Safety – Attach FLD56 | <input type="checkbox"/> Drum Handling – Attach FLD58 | <input type="checkbox"/> Gasoline Contaminant Exposure – Attach FLD61 |
| <input type="checkbox"/> Noise – Attach CECHSP, Section 7 | <input checked="" type="checkbox"/> Walking/Working Surfaces | <input type="checkbox"/> Oxygen Deficiency |
| <input type="checkbox"/> Unknowns in Tanks or Drums | <input type="checkbox"/> Nonionizing Radiation | <input type="checkbox"/> Ionizing Radiation |

Biological Hazards to Personnel

- | | |
|---|---|
| <input type="checkbox"/> Infectious/Medical/Hospital Waste – Attach FLD 44 and 45 | <input type="checkbox"/> Non-domesticated Animals – Attach FLD43A |
| <input type="checkbox"/> Insects – Attach FLD 43B | <input type="checkbox"/> Poisonous Plants/Vegetation – Attach FLD 43D |
| <input type="checkbox"/> Raw Sewage | <input type="checkbox"/> Bloodborne Pathogens – Attach FLD 44 and 45 |

Training Requirements

- | | |
|---|--|
| <input checked="" type="checkbox"/> 40-Hour HAZWOPER Training with three days supervised experience | <input type="checkbox"/> 8-Hour Management or Supervisor Training in addition to basic training course |
| <input checked="" type="checkbox"/> 8-Hour Annual Refresher Health and Safety Training | <input type="checkbox"/> Site Specific Health and Safety Training |
| <input type="checkbox"/> DOT (CMV Training - ERV in Use) | <input type="checkbox"/> Bio-Medical Collection and Response |

Medical Surveillance Requirements

- | | |
|--|---|
| <input checked="" type="checkbox"/> Baseline initial physical examination with physician certification | <input checked="" type="checkbox"/> Annual medical examination with physician certification |
| <input type="checkbox"/> Site Specific medical monitoring protocol (Radiation, Heavy Metals) | <input type="checkbox"/> Asbestos Worker medical protocol |

Vehicle Use Assessment and Selection

Driving is one of the most hazardous and frequent activities for Weston Employees. As such, Weston Employees are required to adhere to established safe operating practices in order to maintain their eligibility to drive Weston owned, leased, or rented vehicles. Every person riding in a Weston vehicle, including passengers must maintain a commitment for a safe journey. This means being attentive while in the vehicle and helping the driver to notice hazards ahead of and around the vehicle and ensure that their presence does not distract the driver from safely operating the vehicle.

A high percentage of vehicle accidents occur when operating in reverse. Anytime a vehicle is operated in reverse, e.g., backing out of a parking area, if there are passengers, at least one of them are to assist the driver by acting as a guide person during the reverse movement or during other vehicle operation where it would be prudent to have a guide person(s) participate in the vehicle movement. When practical, the preferred parking method would be to back into the parking area.

At a minimum, each Weston Driver must:

- Possess a current, valid drivers' license
- Obey posted speed limits and other traffic laws
- Wear seat belts at all times while the vehicle is in operation
- Conduct a 360 degree inspection around the vehicle before attempting to drive the vehicle
- Report accidents / incidents immediately and complete a Notice of Incident (NOI)
- Keep vehicles on approved roadways (4WD doesn't guarantee mobility on unapproved surfaces)

All Region II RST personnel are experienced and qualified to drive RST fleet vehicles (Trailblazers, Suburbans, Cargo Van, and 10' x 12' Box Truck). However, in the event that vehicle rental is required, each person must take the time to familiarize themselves with that particular vehicle. This familiarization includes adjustment of the dashboard knobs/controls, mirrors, steering wheel, seats, and a 360 degree external inspection of the vehicle.

1. The following vehicles are anticipated to be used on this project:

- | | |
|---|--|
| <input type="checkbox"/> Car | <input type="checkbox"/> Pickup Truck |
| <input checked="" type="checkbox"/> Intermediate/Standard SUV (e.g. Chevy Trailblazer, Chevy Tahoe, Ford Explorer, Ford Escape) | <input type="checkbox"/> Full Size SUV (e.g. Chevy Suburban, Ford Expedition, GMC Yukon) |
| <input type="checkbox"/> Minivan/Cargo Van (e.g. Chevy Uplander) | <input type="checkbox"/> Box Truck (Size: _____) |
| <input type="checkbox"/> Emergency Response Vehicle (ERV) | <input type="checkbox"/> Other _____ |

2. Are there any on-site considerations that should be noted?

- | | | | |
|--|---|--|--|
| <input checked="" type="checkbox"/> Working/Driving Surfaces | <input type="checkbox"/> Debris | <input type="checkbox"/> Overhead Clearance | <input type="checkbox"/> Obstructions |
| <input type="checkbox"/> Tire Puncture Hazards | <input type="checkbox"/> Vegetation | <input type="checkbox"/> Terrain | <input checked="" type="checkbox"/> Parking |
| <input checked="" type="checkbox"/> Congestion | <input checked="" type="checkbox"/> Site Entry/Exit Hazards | <input checked="" type="checkbox"/> Local Traffic Volume | <input checked="" type="checkbox"/> Security |
| <input type="checkbox"/> Heavy Equipment | <input type="checkbox"/> Time/Length of Work Day | <input type="checkbox"/> Other: | |

Do any of the considerations above require further explanation: No

3. Was the WESTON Environmental Risk Management Tool completed in EHS? Yes

Was an Environmental Compliance Plan required? No

4. Are there any seasonal considerations that should be noted (e.g., Anticipated Snowy Conditions): No

5. Is a Traffic Control Plan required? ☐ Yes ☒ No

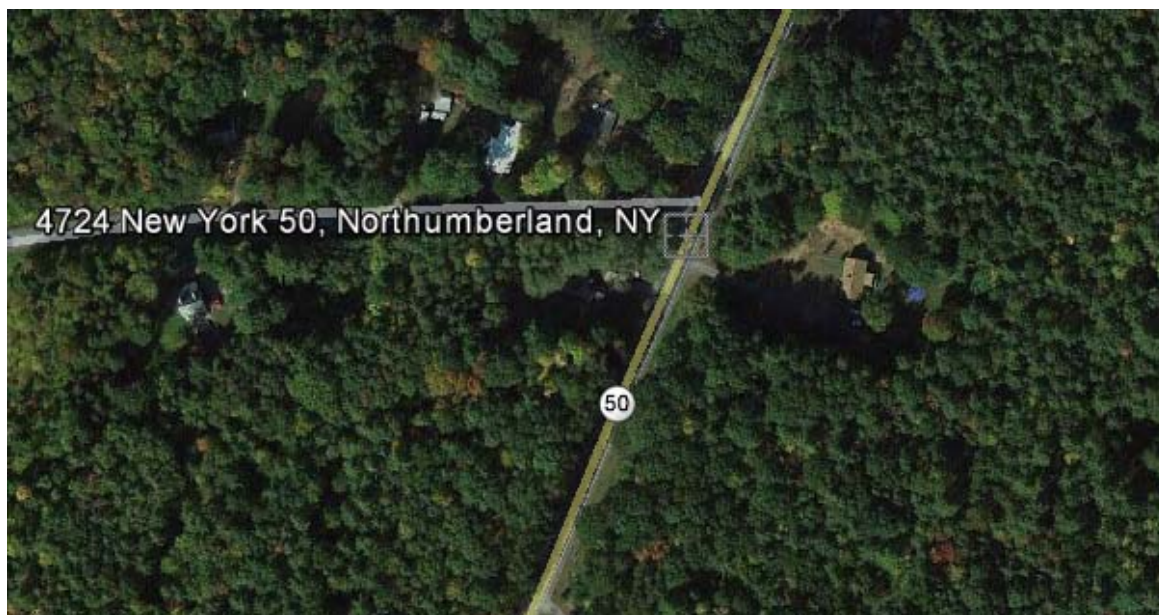
Chemical Hazards to Personnel

The contents of many on-site drums/containers are unknown to RST 2. The Site consists of a main garage building and surrounding property which contains labeled and unlabeled drums of automotive chemicals and unknowns including waste oil and other lubricants

Physical Parameters	To be Determined
Exposure Limits IDLH Level	_____ ppm _____ mg/m ³ PEL _____ ppm _____ mg/m ³ REL _____ ppm _____ mg/m ³ IDLH
Physical Form (Solid/Liquid/Gas) Color	_____ Solid _____ Liquid _____ Gas _____ Color
Odor	Odorless
Flash Point Flammable Limits	_____ Degrees F _____% UEL _____% LEL
Vapor Pressure Vapor Density	_____ mm _____ Air = 1
Specific Gravity	_____ Water = 1
Solubility	
Incompatible Material	
Routes of Exposure	_____ Inh _____ Abs _____ Con _____ Ing
Symptoms of Acute Exposure	
First Aid Treatment	
Ionization Potential	_____ eV
Instruments for Detection	_____ PID w/ _____ Probe _____ FID _____ CGI _____ RAD _____ Det Tube _____ pH Other

Control Measures:

Site Map with work zones: Work zones are currently unknown. The appropriate work zones will be determined on-site based on the proposed sampling locations.



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Work Zone Definitions:

Exclusion Zone - the area where contamination is either known or expected to occur and the greatest potential for exposure exists. The outer boundary of the Exclusion Zone, called the Hotline, separates the area of contamination from the rest of the Site.

Contamination Reduction Zone (CRZ) - the area in which decontamination procedures take place. The purpose of the CRZ is to reduce the possibility that the Support Zone will become contaminated or affected by the site hazards.

Support Zone - the uncontaminated area where workers are unlikely to be exposed to hazardous substances or dangerous conditions. The Support Zone is the appropriate location for the command post, medical station, equipment and supply center, field laboratory, and any other administrative or support functions that are necessary to keep site operations running efficiently.

Communications:

- | | | | |
|-------------------------------------|--------------------------|--------------------------|------------------------------|
| <input checked="" type="checkbox"/> | Buddy System | <input type="checkbox"/> | Radio |
| <input type="checkbox"/> | Air Horn for Emergencies | <input type="checkbox"/> | Hand Signals/ Visual Contact |

Personnel Decontamination Procedures:

- | | |
|-------------------------------------|---|
| <input type="checkbox"/> | Wet Decontamination (procedures as follows) |
| <input checked="" type="checkbox"/> | Dry Decontamination (procedures as follows) |

All work will be conducted in Level D PPE. All dedicated gloves and booties (if used) will be collected in trash bags and disposed of in accordance with applicable federal, state, and local regulations.

Equipment Decontamination Procedures:

- | | |
|-------------------------------------|---|
| <input checked="" type="checkbox"/> | None |
| <input type="checkbox"/> | Wet Decontamination (procedures as follows) |
| <input type="checkbox"/> | Dry Decontamination (procedures as follows) |

Adequacy of decontamination determined by: Site Health & Safety Officer

Personal Protective Equipment

TASK TO BE PERFORMED	ANTICIPATED LEVEL OF PROTECTION	TYPE OF CHEMICAL PROTECTIVE COVERALL	INNER GLOVE / OUTER GLOVE / BOOT COVER	APR CARTRIDGE TYPE or SCBA
Potable water sampling activities and documentation	Level D*	None	Blue Nitrile/Blue Nitrile/Rubber Bootie	None

*Level D will include safety glasses

Hazard Task Analysis

RISK LEVEL (High, Medium, Low)	TASK/HAZARD	RECOGNITION / SYMPTOMS	MITIGATION	LEVEL OF PROTECTION
Low	Task: Potable water sampling. Hazard: Chemical exposure from sample collection.		Appropriate levels of PPE and proper decontamination procedures will be utilized to mitigate the risk of exposure to site contaminants.	Level D
Medium	Slips, Trips, Falls and Uneven Walking Surfaces	Exterior walking surfaces clear of debris and uneven surfaces that may increase the potential for an incident.	Maintain walking paths in cleared areas.	Level D

Frequency and Types of Air Monitoring: None.

☐ Continuous

☐ Routine - _____

☐ Periodic - _____

DIRECT READING INSTRUMENTS	MultiRAE CGI / O ₂ / H ₂ S / CL ₂ / CO / PID	Ludlum 19 Micro-R Meter / Ludlum Model 3 Survey Meter	MicroFID or TVA- 1000	Drager Chemical Detector Tube	Lumex Mercury Vapor Analyzer or Jerome 431X
EQUIPMENT ID NUMBER					
CALIBRATION DATE					
RST 2 PERSONNEL					
ACTION LEVEL	<p>≥ 10 - 20% LEL (Confined Space / non- Confined Space)</p> <p>≤ 19.5%, O₂ Deficient ≥ 23% O₂ – Enriched</p> <p>H₂S – PEL: 20 ppm IDLH: 100 ppm</p> <p>Cl₂ – PEL: 1 ppm IDLH: 10 ppm</p>	<p><3X Background Exercise Caution;</p> <p>≥ 1 mR/HR – Exit Area, Establish Perimeter, Contact RST 2 HSO</p>	<p>Unknowns: 1 - 5 Units - "Level C"</p> <p>5-500 Units- "Level B"</p>	<p>PEL / TLV / IDLH: Compare with Drager Tube</p> <p>(See Chart Below)</p>	<p>Mercury Vapors (Except Organo Alkyls):</p> <p>PEL - 0.1 mg/m³ IDLH – 10 mg/m³</p>

Dräger Tubes	Expiration Date	Strokes	Color Change
Nitrogen Dioxide - 2 to 100 PPM	See individual package before use	10 or 5	yellowish-green to bluish-grey
Phosgene - 0.25 to 5 PPM	See individual package	40 or 20	white to red
Hydrochloric Acid - 50 to 5,000 PPM	See individual package	1 or 10	blue to white
Cyanide - 2 to 15 mg/m ³	See individual package	10	yellow to red
Acetic Acid - 5 to 80 PPM	See individual package	3	blue/violet to yellow
Chlorine - 0.2 to 3 PPM	See individual package	10	white to yellowish-orange
Ammonia - 5 to 70 PPM	See individual package	10	yellow to blue

Emergency Telephone Numbers

Emergency Contact	Location / Address	Telephone Number	Notified
Hospital	Glens Falls Hospital 100 Park Street Glens Falls, NY	(518) 926-1000	Yes
Ambulance	Schuyler Hose Co. 35 Spring Street Schuylerville, NY	(518) 695-3142 Or call 911	No
Police	New York State Police Department 30 Ferry Street Schuylerville, NY	(518) 695-3626 Or call 911	No
Fire Department	Schuyler Hose Co. 35 Spring Street Schuylerville, NY	(518) 695-3142 Or call 911	No

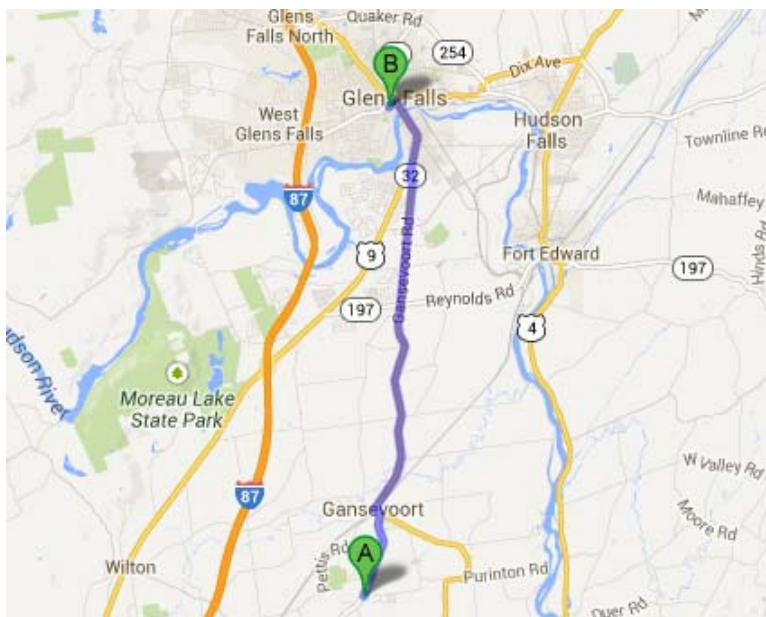
Chemical ☒ Yes ☐ No Trauma Capability?

If no, closest backup: _____ Phone: _____

Directions to Glens Falls Hospital:

1. Head north on NY-50 N toward Stormy Ln 1.7
1.7 mi
2. Continue onto NY-32 N/Rte 32 N/State 32 N/State Route 32 N/Schuylerville Rd 456 ft
456 ft
3. Turn right onto NY-32 N/Rte 32 N/State 32 N/State Route 32 N/Gansevoort Rd/Leonard St
Continue to follow NY-32 N/Rte 32 N/State 32 N/State Route 32 N/Gansevoort Rd 6.7
6.7 mi
4. Turn right onto NY-32 N/U.S. 9 N/Saratoga Ave
0.7 mi
5. Turn left onto NY-32 N/Rte 32 N/State 32 N/State Route 32 N/U.S. 9 N/Main St
Continue to follow NY-32 N/Rte 32 N/State 32 N/State Route 32 N/U.S. 9 N

Total Estimated Distance: 9.9 miles. Total Estimated Time: 17 minutes



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Route verified by: _____ Date: __/__/

Additional Emergency Phone Contacts

WESTON Medical Emergency Service Dr. Peter Greaney, Medical Director WorkCare 300 South Harbor Blvd, Suite 600 Anaheim, California 92805	800-455-6155 Regular Business Hours (9AM to 7:30PM) Dial 0 or Ext. 175 for Michelle Bui to request the on-call clinician. 800-455-6155 After Hours (Weekdays 7:31PM to 8:59AM, Weekends, Holidays) Dial 3 to reach the after-hours answering service. Request that the service connect you with the on-call clinician or the on-call clinician will return your call within 30 minutes.
Chemtrec	800-424-9300
ATSDR	404-639-0615
ATF (explosives information)	800-424-9555
National Response Center	800-424-8802
National Poison Control Center	800-764-7661
Chemtel	800-255-3924
DOT	800-424-8802
CDC	800-232-0124

Pre-Response Approval

HASP prepared by: Aleksandra Mallon Date: 9/9/2013

Pre-Response/Entry Approval by:  Date: 9/9/13

Tasks Conducted	Level of Protection/Specific PPE Used
Potable water sampling activities and documentation	Level D

Hazardous Waste Site and Environmental Sampling Activities

Off Site: ☒ Yes ☐ No

On Site: ☐ Yes ☒ No

Describe types of samples and methods used to obtain samples:

Up to 11 potable water samples will be collected from several properties within a quarter-mile of the Site. Samples will be collected from approximately 10 residential properties and one commercial property. Water will be collected from the kitchen sinks of each property which be analyzed for TCL VOCs, SVOCs, and TAL metals.

Was laboratory notified of potential hazard level of samples? ☒ Yes ☐ No

Note: The nature of the work assignment may require the use of the following procedures/programs which will be included as attachments to this HASP as applicable: Emergency Response Plan, Confined Space entry Procedures, Spill Containment Program.

Disclaimer: This site-specific HASP was prepared for work to be conducted under the RST 2 Contract EP-W-06-072. Use of this site-specific HASP by WESTON and its subcontractors is intended to fulfill the OSHA requirements found in 29 CFR 1910.120. Items not specifically covered in this HASP are included by reference to 29 CFR 1910 and 1926.

The signatures below indicate that the individuals have read and understood this Health and Safety Plan.

PRINTED NAME	SIGNATURE	AFFILIATION	DATE

Post-Response Approval

Final Submission of HASP by:		Date
Post Response Approval by:		
RST 2 HSO Review by:		

Air Monitoring Summary Log

Date:

Data Collected by: RST 2

Station/Location	CGI / O ₂ Meter / CL ₂ / H ₂ S	Radiation Meter	MultiRae PID (10.6 EV Lamp)	MiniRae PID (11.7 EV Lamp)	Other (HCN)

ATTACHMENT A
WESTON FLDS

FLD 02 INCLEMENT WEATHER

Hot weather (ambient temperatures over 70°F), cold weather (ambient temperatures below 40°F), rain, snow, ice, and lightning are examples of inclement weather that may be hazardous or add risk to work activities. Extremes of heat, cold, and humidity, as well as rain, snow, and ice, can adversely affect monitoring instrument response and reliability, respiratory protection performance, and chemical protective clothing materials.

RELATED FLDs AND OP

FLD 05 – Heat Stress Prevention and Monitoring

FLD 06 – Cold Stress

OP 05-03-008 – Inclement Weather & Business Disruption Policy

PROCEDURE

The potential for exacerbating the impact of physical hazards must be considered for tasks that expose personnel to inclement weather. Risk assessment and hazards analysis should be accomplished during the planning stages of a project for the most likely inclement weather conditions that may be encountered, i.e., rain and lightning in late spring, summer, and early fall, or lightning prone areas; cold, snow, and ice in winter. The Field Safety Officer (FSO) must determine the proper safety procedures and recommend them to the site manager. Each worker must evaluate the risk associated with his/her work and be actively alert to these hazards. Managers and workers must be familiar with the requirements of FLD 05 and FLD 06.

A pre-site activity risk assessment must be completed when inclement weather occurs. Weather conditions that affect instruments and personal protective equipment (PPE) function must be conveyed to site workers who should monitor function and integrity of PPE and be alert to changing weather conditions. A decision must be made on the proper safety procedures to use if work must continue, or to stop work if the risk is too great. The appropriate Safety Professional **must be notified of all instances of the need to stop work for safety reasons, including inclement weather.**

Heat

Hot, dry weather increases risk of soil drying, erosion, and dust dispersion, which may present or increase risk of exposure and environmental impact from toxic hazards. Hot weather will increase pressure on closed containers and the rate of volatilization, thereby potentially increasing the risk of exposure to toxic, flammable, or explosive atmospheres.

Prevention and Protective Measures

Employees must be protected from airborne contaminants using engineering controls such as wetting dry soil to prevent particle dispersion, and providing local ventilation to reduce volatile air contaminants to safe levels, or if engineering controls are infeasible, using prescribed PPE. Wind shifts and velocity should be measured where change may result in dispersion of airborne contaminants into the work area.

Rain, Wet Weather, and High Humidity

Wet conditions resulting from rain and wet weather increase slipping and tripping hazards, braking distances of vehicles, the potential for vehicle skidding, or difficulties in handling powered devices such as augers and drills. Rain fills holes, obscures trip and fall hazards, and increases risk of electrical shock

when working with electrical equipment. Changes in soil conditions caused by rain can impact trenching and excavating activities, creating the potential for quicksand formation, wall collapse, and cave-in. Vehicles become stuck in mud, and tools and personnel can slip on wet surfaces. Rain and wet conditions may decrease visibility (especially for personnel wearing respiratory protection) and limit the effectiveness of certain direct-reading instruments (e.g., photoionization detectors [PIDs]).

Feet that become wet and are allowed to remain wet can lead to serious problems under both heat and cold conditions. Activities that may result in wet feet include extended work in chemical protective clothing and wading in water/liquid during biological assessments. Trench foot, paddy foot, and immersion foot are terms associated with foot ailments resulting from feet being wet for long periods of time. All have similar symptoms and effects. Initial symptoms include edema (swelling), tingling, itching, and severe pain. These may be followed by more severe symptoms including blistering, death of skin tissue, and ulceration. (NOTE: The following Preventive and Protective Measures also apply to Cold, Snow, and Ice.)

Preventive and Protective Measures

Walkways, stairs, ladders, elevated workplaces, and scaffold platforms must be kept free of mud, ice, and snow. Employees shall be prohibited from working on scaffolds covered with snow, ice, or other slippery material except as necessary for removal of such materials.

Vehicles used in rain or cold weather must have working windshield wipers and defrosters, and windows must be kept clear of obstruction.

Drivers must observe traffic laws, including maintaining speed within limits safe for weather conditions, and wearing seat belts at all times. Note that this may mean operating below the posted speed limit.

When walking, workers should use a walking stick or probe to test footing ahead where there is standing water, snow, or ice to protect the walker against stepping into potholes or onto puncture hazards, buried containers, or other potential structurally unsound surfaces.

Prior to using vehicles or equipment in off-road work, workers should walk the work area or intended travelway when puddles or snow may obscure potholes, puncture hazards, or buried containers, or other potential structurally unsound surfaces.

Project managers should arrange to have winches, come-alongs, or other mechanical assistance available when vehicles are used in areas where there is increased risk of getting stuck. Cable or rope and mechanical equipment used for pulling stuck vehicles must be designed for the purpose, of sufficient capacity for the load, and be inspected regularly and before use to ensure safety. **Manually pushing stuck vehicles is to be avoided.**

Prevention methods are required when work is performed in wet conditions or when conditions result in sweating, causing the feet to become and remain wet. Proper hygiene is critical. Workers must dry their feet and change socks regularly to avoid conditions associated with wet feet. Use of foot talc or powder can additionally assist in prevention of this type of condition.

Cold, Snow, and Ice

Cold weather affects vehicle operation by increasing difficulty in starting and braking. Ice, frost, and snow can accumulate on windows and reduce vision. Cold, wet weather can cause icing of roadways,

driveways, parking areas, general work places, ladders, stairs, and platforms. Ice is not always as obvious to see as snow or rain, and requires special attention, especially when driving or walking.

Snow and ice increase the risk of accidents such as slipping when walking, climbing steps and ladders, or working at elevation, and the risk of accidents when driving vehicles or operating heavy equipment. Heavy snow and ice storms may cause electric lines to sag or break, and the use of electrical equipment in snow increases the risk of electric shock. Snow can hide potholes and mud, which can result in vehicles getting stuck or persons falling when stepping into hidden holes. Snow also may cover water, drums or other containers, sharp metal objects, debris, or other objects that can cause falls or punctures.

Preventive and Protective Measures

WESTON personnel are cautioned against operating motor vehicles such as cars or trucks on ice under any circumstances. If traveling in icy conditions, WESTON personnel should follow all public service advisories that curtail driving activities.

Personnel performing activities that require working over ice should be aware of minimal ice thickness safety guidelines as follows:

- 4-inch minimum: activities such as walking or skating.
- 6-inch minimum: activities such as snowmobiling or the use of equipment with the same weight and cross-sectional area as a snowmobile.

Personnel should always be aware that these measurement guidelines are under ideal conditions and that snow cover, conditions on rivers, ponds, or lakes with active currents, and other environmental factors impact the safety of working on ice. Clear ice typically is the strongest, while ice that appears cloudy or honeycombed (contains entrained air) is not as structurally strong. Measurements made by drilling or cutting through the ice should be made every few feet to verify safe conditions. Provisions for rescue (e.g., ladders or long poles and effective communications) must be available at the work site.

Lightning

Lightning represents a hazard of electrical shock that is increased when working in flat open spaces, elevated work places, or near tall structures or equipment such as stacks, radio towers, and drill rigs. Lightning has caused chemical storage tank fires and grass or forest fires. Static charges associated with nearby electrical storms can increase risk of fire or explosion when working around flammable materials, and can adversely affect monitoring instruments.

Lightning is the most dangerous and frequently encountered weather hazard people experience each year. Lightning affects all regions. **Florida, Michigan, Pennsylvania, North Carolina, New York, Ohio, Texas, Tennessee, Georgia, and Colorado** have the most lightning deaths and injuries.

Preventive and Protective Measures

Prior to working in areas or beginning projects when or where there is an increased potential for lightning striking personnel, steps must be taken to predict the occurrence of lightning strikes. Recommendations include:

- Check with client management to determine if there are any patterns or noted conditions that can help predict lightning or if there are structures that are prone to lightning strikes. Arrange for

client notification when there is increased potential for lightning activities. Ensure that clients include WESTON workers in lightning contingency plans.

- Monitor weather reports.
- Note weather changes and conditions that produce lightning.
- Stop work in open areas, around drill rigs or other structures that may attract lightning, on or in water and in elevated work places when lightning strikes are sighted or thunder is heard near a work site.
- Ensure all personnel are provided with safe areas of refuge. Prevent personnel from standing in open areas, under lone trees, or under drill rigs.
- Observe the “30-30” Rule. If you see lightning and thunder is heard within 30 seconds (approximately 6 miles), seek shelter. If you hear thunder, but did not see the lightning, you can assume that lightning is within 6 miles and you should seek shelter. Remain in the sheltered location for 30 minutes following the last lightning strike.
- Use a hand held static potential meter (lightning detection device) to monitor the potential difference between a cloud and the ground. When the measured potential is greater than 2 kV/m, there is a potential for a lightning strike – seek shelter.

High Wind and Tornado Safety

High Winds

Many construction workers have died due to wind-related accidents and injuries. A ladder that seems secure under normal circumstances can become unstable during windy conditions and cause you to fall. Scaffolding that is improperly secured can rip free during strong winds and kill bystanders. The risk of injury for construction workers increases during strong winds. Keep in mind that changing weather conditions can affect your daily work tasks, and make sure you have a game plan to prevent proper damage and personal injury.

Stay Informed: With today’s modern technology available at the touch of a button, you should keep up to date with the latest local weather reports. Visit weatherbug.com or weather.gov to stay informed in case of wind warnings, watches, and advisories. Larger projects may have their own weather station on site to provide instant weather data. Use daily hazard assessments to determine if working conditions have changed or will change throughout the day.

Be Prepared: When you know the weather will be windy, secure loose building materials, scaffolding and fencing that could be picked up or torn loose by strong winds and thrown onto surrounding streets, structures, vehicles, or bystanders.

Know the Limits of Your Equipment: When operating any equipment, take time to read the operator’s manual and become familiar with the wind specifications. Many crane manufacturers have high-wind guidelines to prevent you from operating a crane in unsafe weather. You should also check safety equipment such as fall protection to determine if it is adequate for windy conditions.

Know the Terminology

Severe Thunderstorm Watch

A Severe Thunderstorm Watch means that strong thunderstorms capable of producing winds of 58 mph or higher and/or hail 3/4 inches in diameter or larger are possible. If you are in the area of a Severe Thunderstorm Watch, you should be prepared to take shelter from thunderstorms. Severe Thunderstorm Watches are generally issued for 6-hour periods.

Severe Thunderstorm Warning

A Severe Thunderstorm Warning means that thunderstorms capable of strong winds and/or large hail are occurring or could form at any time. If you are in the area of a severe thunderstorm, you should take shelter indoors immediately, avoid windows, and be prepared for high winds and hail. Severe Thunderstorm Warnings are generally in effect for an hour or less.

High Wind Watch

A High Wind Watch is issued when sustained winds exceeding 40 mph and/or frequent gusts over 60 mph are likely to develop in the next 24 to 48 hours. For summit areas, high wind watches are issued when sustained winds are expected to exceed 45 mph and/or frequently gust over 60 mph. If you are in an area for which a High Wind Watch has been issued you should secure loose objects outdoors that may blow about and avoid outdoor activity that exposes you to high winds.

High Wind Warning

A High Wind Warning is issued when sustained winds exceeding 40 mph and/or frequent gusts over 60 mph are occurring or imminent. For summit areas, warnings are issued for winds exceeding 45 mph and/or frequently gusting over 60 mph. Wind warnings may issued up to 24 hours ahead of the onset of high winds and remain in effect for 6 to 12 hours. If you are in an area where a high wind warning is in effect you should avoid activities that expose you to high winds. Loose objects may be blown around. Tree limbs may break and fall. Power lines may be blown down.

Wind Advisory

A Wind Advisory is issued when sustained winds of 30 to 39 mph and/or frequent gusts to 50 mph or greater are occurring or imminent. Wind advisories may be in effect for 6 to 12 hours. If you are in an area where a wind advisory is in effect you should secure loose objects that may be blown about outdoors and limit activity that may expose you to high winds.

Work Safely: If you will be working on a windy day, you should be alert and protected. Wear eye protection to prevent dust and other particles from entering or striking your eyes. Keep your hard hat on at all times to prevent injuries from falling or flying objects. The likelihood of falls from heights is greatly increased by strong winds. Wear the necessary PPE to ensure your safety.

To avoid flying debris and to minimize damage during high winds:

- Shut down outdoor activities involving work at elevation on ladders, scaffolding, aerial lifts, etc.; handling large tarps and plastic sheeting when wind speeds exceed 25 mph; including work with radioactive materials and highly toxic materials that could be dispersed by the winds.
- At 13 - 18 mph wind will raise dust. Follow the dust action level.

- Move mobile items stored outside to indoor storage.
- Secure any items that cannot be moved inside.
- Be careful opening exterior doors.
- Be cautious about downed power lines, tree limbs, and debris on roads.
- Be alert for animals who have escaped from farms and zoos.

Stay Away from Power Lines: High winds can cause tree limbs to fall on power lines resulting in electrocution hazards or loss of power. Your best bet is to keep your distance.

Tornados

What is a TORNADO?

A tornado is a violent windstorm characterized by a twisting, funnel-shaped cloud. It is spawned by a thunderstorm or as a result of severe weather associated with hurricanes. A funnel cloud is formed as cool air overrides a layer of warm air, forcing the warm air to rise rapidly. The damage from a tornado results from high wind velocity and wind blown debris.

Tornado Safety

When a tornado approaches, you have only a brief amount of time to make life-or-death decisions. Advance planning and quick response are the keys to surviving a tornado.

Purchase a NOAA Weather Alert radio with an alert feature. When tuned to the proper frequency, these weather radios remain silent until a weather emergency occurs. Once they pick up the alarm tone, they will begin broadcasting emergency weather information so that citizens can protect themselves and their property. Some models of the NOAA weather radio incorporate the Specific Area Message Encoder technology, allowing users to target only those warnings that affect their immediate geographic area.

Conduct tornado drills. Designate an area to serve as your safe area, and practice having team members assemble there in response to a mock tornado warning.

Emergency Communications Plan. Develop an emergency communications plan in case team members are separated from one another when a tornado warning goes into effect. Designate an emergency coordinator. Instruct everyone to contact this coordinator in a weather emergency for instructions on what to do during the storm and where to reassemble after the emergency has passed. Design contingency plans to be consistent with client contingency plans. When possible use client warning and alerting systems and confirm that team members have access to shelters and know how to get to them.

Know the Difference between a Tornado Watch and a Tornado Warning

Tornado Watch: Issued by the National Weather Service when tornadoes are possible in your area. You should remain alert for approaching storms. Remind family members of where the safe areas are within your home, and carefully monitor radio or television reports for further developments.

Tornado Warning: Indicates that a tornado has been sighted in your area, or is indicated on weather radar. You should proceed to safe shelter immediately.

When A Tornado Warning Goes In Effect, Put Your Safety Plans In Action.

In Your Automobile: Motor vehicles are easily overturned by tornado winds. Leave your vehicle and seek shelter in a sturdy building. As a last resort, seek shelter in a ditch or culvert. Do not try to outrun or outmaneuver a tornado! Use the time to seek appropriate shelter outside your vehicle.

Office Buildings, Hotels, and Shopping Centers: Take shelter in an interior hallway on a lower floor. A closet, bathroom or other small room with short, stout walls will give some protection from collapse and flying debris. Otherwise, get under heavy furniture and stay away from windows. Many tornado deaths have occurred in large buildings due to the collapse of a roof or wide span wall. A corner area, away from a window, is safer than the middle of a wide span wall.

Out In Open Country: When severe weather approaches, seek inside shelter immediately. The chances of encountering falling trees, downed power lines and lightning are far greater than encountering a tornado itself. If a tornado approaches, lie flat in the nearest depression, such as a culvert or ditch, and cover your head with your arms.

BE ALERT TO CHANGING WEATHER CONDITIONS

HAVE AN EMERGENCY WEATHER PLAN IN PLACE

REHEARSE YOUR CONTINGENCY PLANS PERIODICALLY

KNOW WHERE TO GO WHEN A TORNADO THREATENS.

FLD 05 HEAT STRESS PREVENTION AND MONITORING

Heat stress may occur at any time work is performed at elevated temperatures. If the body's physiological processes fail to maintain a normal body temperature because of excessive heat, a number of physical reactions can occur such as fatigue, irritability, anxiety, and decreased concentration or dexterity, and possibly death. Because heat stress is one of the most common and potentially serious illnesses at field sites, regular monitoring and other preventive measures are vital to ensure worker safety. Wearing chemical protective clothing often decreases natural body heat loss (cooling) and increases the risk of heat stress.

Employees who are taking prescription or over-the-counter medications should consult with their personal physician prior to working in high-temperature environments to see if their medication would impair their ability to handle heat stress.

REFERENCES

OSHA 29 CFR 1910 and 1926

RELATED FLDs

FLD 02 – Inclement Weather

FLD 03 – Hot Processes – Steam, Low Temperature Thermal Treatment Unit, and Transportable Incinerator

FLD 08 – Confined Space Entry Program

FLD 36 – Welding/Cutting/Brazing/Radiography

FLD 37 – Pressure Washers/Sandblasting

PROCEDURE

Heat Stress Symptoms and Treatment

Heat Rash

Heat rash, also known as prickly heat, may occur in hot and humid environments where sweat is not easily removed from the surface of the skin by evaporation and is aggravated by chafing clothes. When extensive or complicated by infection, heat rash can be so uncomfortable that it inhibits sleep and impairs a worker's performance.

Symptoms – Mild red rash, especially in areas of the body that come into contact with protective gear.

Treatment – Decrease amount of time spent working in protective gear and provide body powder to help absorb moisture and decrease chafing. Heat rash can be prevented by showering, resting in a cool place, and allowing the skin to dry.

Heat Cramps

Heat cramps are caused by inadequate electrolyte intake. The individual may be receiving adequate water; however, if not combined with an adequate supply of electrolytes, the blood can thin to the point where it seeps into the active muscle tissue, causing cramping.

Symptoms – Acute painful spasms of voluntary muscles, most notably the abdomen and extremities.

Treatment – Move the victim to a cool area and loosen clothing. Have the victim drink 1 to 2 cups of cool potable water or diluted commercial electrolyte solution (e.g., Gatorade, Quench) immediately, and then every 20 minutes thereafter until symptoms subside. Electrolyte supplements can enhance recovery; however, it is best to double the amount of water required by the dry mix package directions or add water to the liquid form.

Heat Exhaustion

Heat exhaustion is a state of weakness or exhaustion caused by the loss of fluids from the body. Heat exhaustion is not as dangerous as heat stroke, but if not properly managed in the field it may lead to heat stroke.

Symptoms – Pale, clammy, and moist skin, profuse perspiring, and extreme weakness. Body temperature is normal, pulse is weak and rapid, and breathing is shallow. The person may have a headache, may vomit, may feel dizzy, and may be irritable or confused.

Treatment – Move the victim to a cool, air-conditioned or temperature-controlled area, loosen clothing, place in a position with the head lower than the feet (shock prevention), and allow the victim to rest. Consult a physician. Ensure that the victim is not nauseated or vomiting. If not nauseated or vomiting, give the victim small sips of cool water or diluted electrolyte replenishment solution (one to one dilution with water, or if mixing from powder, double the water added). If this is tolerated, have the victim drink 1 to 2 cups of fluid immediately, and every 20 minutes thereafter until symptoms subside. Seek medical attention at the advice of the consulting physician.

Heat Stroke

Heat stroke is an acute and dangerous reaction to heat stress caused by a failure of the body's heat regulating mechanisms, i.e., the individual's temperature control system (sweating) stops working correctly. Body temperature rises so high that brain damage and death may result if the person is not cooled quickly.

Symptoms – Red, hot, dry skin (although the person may have been sweating earlier); nausea, dizziness, confusion, extremely high body temperature (i.e., 104°F or greater as measured with an oral thermometer), rapid respiratory and pulse rate, seizures or convulsions, unconsciousness or coma.

Treatment – Immediately call for emergency medical assistance. Remove the victim from the source of heat and cool the victim quickly. If the body temperature is not brought down quickly, permanent brain damage or death may result. Remove all PPE and as much personal clothing as decency permits. Fan the person while sponging or spraying with cool or tepid water. Apply ice packs (if available) to the back of the neck, armpits, groin area, or behind the knees. Place the victim flat on their back or with head and shoulders slightly elevated. If conscious, and not nauseated or vomiting, the victim may be provided sips of cool water. Do not give the victim coffee, tea, or alcoholic beverages. Emergency medical personnel will take over treatment when they arrive.

Recognition and Risk Assessment

In the planning stages of a project, the potential for heat stress disorders must be considered as a physical hazard in the site-specific Health and Safety Plan (HASP). Risk assessment can be accomplished in the development stages of a project by listing in the HASP the most likely heat stress disorders that may occur. The Field Safety Officer (FSO) must make decisions on the proper safety procedures and recommend them to the site manager. Each worker must evaluate the risk associated with his or her work and be actively alert to these hazards. Any site worker may stop work if safety procedures are not

followed or the risk is too great. In addition, all site personnel must be aware of these symptoms in both themselves and their co-workers.

Prevention and Protection Programs

Heat stress is affected by several interacting factors including, but not limited to, age, obesity, physical condition, substance abuse, level of personal protective equipment (PPE) worn, and environmental conditions (temperature, shade, and humidity). Site workers must learn to recognize and treat the various forms of heat stress. The following recommendations should be followed to prevent heat stress:

- The most important measure to prevent heat-related illness is adequate fluid intake. Workers should drink 1/2 to 1 quarts of liquids per hour in high heat conditions. Most of this liquid should be water. Under heavy work and heat conditions, the body may lose up to 2 gallons of fluids per day. To prevent heat stress symptoms, the individual must ensure replacement of this fluid.
- Provide disposable cups that hold about 4 ounces, and water that is maintained at 50 to 60°F. Workers should drink 16 ounces of water before beginning work, and a cup or two at each break period.
- Provide a shaded area for rest breaks. Ensure that adequate shelter is available to protect personnel against heat and direct sunlight. When possible, shade the work area.
- Discourage the intake of caffeinated drinks during working hours.
- Monitor for signs of heat stress.
- Encourage workers to maintain a good diet during these periods. In most cases, a balanced diet and lightly salted foods should help maintain the body's electrolyte balance. Bananas are especially good for maintaining the body's potassium level.
- If utilizing commercial electrolyte mixes, double the amount of water called for in the package directions. Indications are that "full-strength" preparations taken under high heat stress conditions may actually decrease the body's electrolytes.
- Acclimate workers to site work conditions by slowly increasing workloads (i.e., do not begin work activities with extremely demanding tasks).
- Rotate shifts of workers who are required to wear impervious clothing in hot weather.
- Encourage workers to wear lightweight, light-colored, loose-fitting clothing.
- In extremely hot weather, conduct field activities in the early morning and evening.
- Provide cooling devices to aid natural body heat regulation. These devices, however, add weight and their use should be balanced against worker efficiency. An example of a cooling aid is long cotton underwear, which acts as a wick to absorb moisture and protect the skin from direct contact with heat-absorbing protective clothing.
- Good hygienic standards must be maintained by frequent showering and changes of clothing.
- Clothing should be permitted to dry during rest periods.
- Whenever working in the sun, provide employees with sunscreen with both UVA and UVB protection.
- Persons who notice skin problems should immediately consult medical personnel.

Heat Stress Monitoring and Work Cycle Management

When strenuous field activities are part of on-going site work conducted in hot weather, the following guidelines should be used to monitor the body's physiological response to heat, and to manage the work cycle, even if workers are not wearing impervious clothing. These procedures should be instituted when the temperature exceeds 70°F and the tasks/risk analysis indicates an increased risk of heat stress problems. Consult the HASP and a safety professional (e.g., Division EHS Manager, FSO) if questions arise as to the need for specific heat stress monitoring. In all cases, the site personnel must be aware of the signs and symptoms of heat stress and provide adequate rest breaks and proper aid as necessary.

Measure Heart Rate – Heart rate should be measured by the radial pulse for 30 seconds as early as possible in the rest period. The heart rate at the beginning of the rest period should not exceed 110 beats per minute. If the heart rate is higher, the next work period should be shortened by 33%, while the length of the rest period stays the same. If the pulse rate still exceeds 110 beats per minute at the beginning of the next rest period, the following work cycle should be further shortened by 33%. The procedure is continued until the rate is maintained below 110 beats per minute.

Measure Body Temperature – When ambient temperatures are over 90°F, body temperatures should be measured with a clinical thermometer as early as possible in the rest period. If the oral temperature exceeds 99.6°F (or 1 degree change from baseline) at the beginning of the rest period, the following work cycle should be shortened by 33%. The procedure is continued until the body temperature is maintained below 99.6°F (or 1 degree change from baseline). Under no circumstances should a worker be allowed to work if their oral temperature exceeds 100.6°F.

Measure Body Water Loss – Body water loss greater than 1.5% of total body weight is indicative of a heat stress condition. Body weight is measured before PPE is donned and after the PPE is removed following a work cycle. Body water loss can be measured with an ordinary bathroom scale; however, the scale must be sensitive to one-half pounds increments. A worker is required to drink additional fluids and rest if their body water loss is greater than 1.5%.

NOTE: For purposes of this operating practice, a break is defined as a 15-minute period and/or until an individual's vital signs are within prescribed guidelines.

A physiological monitoring schedule is determined by following the steps below:

- Measure the air temperature with a standard thermometer.
- Estimate the fraction of sunshine by judging what percent the sun is out (refer to Table 1).
- Calculate the adjusted temperature based on the following formula:
$$\text{Adjusted Temperature} = \text{Actual Temperature} + 13 \times X \text{ (where } X = \text{sunshine fraction from Table 1)}$$
- Using Table 2, determine the physiological monitoring schedule for fit and acclimated workers for the calculated adjusted temperature.

The length of work period is governed by frequency of physiological monitoring (Table 2). The length of the rest period is governed by physiological parameters (heart rate and oral temperature).

**Table 1. Percent Sunshine Factors
Heat Stress Prevention and Monitoring**

Percent Sunshine (%)	Cloud Cover	Sunshine fraction
100	No cloud cover	1.0
50	50% cloud cover	0.5
0	Full cloud cover	0.0

**Table 2. Physiological Monitoring Schedule
Heat Stress Prevention and Monitoring**

Adjusted Temperature	Level D (Permeable clothing)	Level C, B, or A (Nonpermeable clothing)
90°F (32.2°C) or above	After each 45 minutes of work	After each 15 minutes of work
87.5°F (30.8° - 32.2°C)	After each 60 minutes of work	After each 30 minutes of work
82.5° - 87.5°F (28.1° - 32.2°C)	After each 90 minutes of work	After each 60 minutes of work
77.5° - 82.5°F (25.3° - 28.1°C)	After each 120 minutes of work	After each 90 minutes of work
72.5° - 77.5°F (22.5° - 25.3°C)	After each 150 minutes of work	After each 120 minutes of work

Example: Site personnel anticipate wearing level C (impermeable clothing) during site activities. The air temperature is 80°F and there are no clouds in the sky (100% sunshine). The adjusted temperature is calculated in the following manner:

$$\begin{aligned}\text{Adjusted Temperature (Adj T } ^\circ\text{F)} &= \text{Actual Temperature (Amb T } ^\circ\text{F)} + (13 \times \text{sunshine fraction}) \\ \text{Adj T } ^\circ\text{F} &= 80^\circ\text{F} + (13 \times 1.0) \\ \text{Adj T } ^\circ\text{F} &= 93^\circ\text{F}\end{aligned}$$

Using Table 2, the pulse rate, oral temperature and body water loss monitoring would be conducted after each 15 minutes of work. The adjusted temperature may need to be redetermined if the percent sunshine and ambient temperature changes drastically during site work.

If an individual's heart rate exceeds 110 beats per minute at the beginning of the rest period, that individual will continue to rest until his or her heart rate drops to baseline; the next work period is then decreased by 33%.

FLD 06 COLD STRESS

Three major factors that contribute to cold stress are cold temperatures, dampness, and wind velocity. Persons working outdoors in low temperatures, especially in wet or windy conditions, are subject to cold stress. Exposure to extreme cold for even a short time can cause severe injury to the surface of the body, or result in cooling of the body core temperature which, if unchecked, can be fatal. Site workers must learn to recognize and treat the various forms of cold stress.

RELATED FLDs

FLD 02 – Inclement Weather

FLD 17 – Diving

FLD 19 – Working Over or Near Water

FLD 25 – Working at Elevation/Fall Protection

GENERAL INFORMATION

Body heat is conserved through the constriction of surface blood vessels. This constriction reduces circulation at the skin layers and keeps blood nearer the body core. Loss of body heat can occur through:

1. Respiration – The process of breathing; inhaling and exhaling air. Heat is lost when breathing cold air into the lungs.
2. Evaporation – Heat loss from the body by vaporization of water from the skin surface.
3. Conduction – Direct transfer of body heat by contact with a cooler object. Conduction may occur when sitting on snow, touching cold equipment, and working in the rain. Body heat is lost rapidly when a person becomes wet. Most clothing loses approximately 90 percent of its insulating properties when wet. Additionally, water conducts heat 240 times faster than air; thus, the body cools suddenly when the layer of clothing that contacts the skin becomes wet.
4. Radiation – Heat radiated outward from the body to a cooler environment. The greatest amount of body heat is lost from uncovered surfaces of the body, especially the head, neck, and hands.
5. Convection – Heat transferred to cool air moving across the surface of the body. The body continually heats a thin layer of air next to the skin. Clothing retains this warm surface layer of air. If this warm air is removed by air currents (wind), the body will be cooled while attempting to rewarm the surface air. Wind chill is the chilling effect of moving air in combination with low temperature.

Other factors may contribute to cold stress, such as:

1. Medications, including antidepressants, sedatives, tranquilizers and some heart medications may affect the body's ability to thermo-regulate.
2. Dehydration, or the loss of body fluids, occurs in a cold environment and may increase the susceptibility of workers to cold injury due to a significant change in blood flow to the extremities.
3. Heavy work typically causes sweating that will result in wet clothing.

4. A worker's predisposing health condition such as cardiovascular disease, diabetes, and hypertension.
5. Older people are not able to generate heat as quickly, thus may be at more risk than younger adults.

When the body is unable to warm itself, serious cold-related illness and injuries may occur, including permanent tissue damage and possible death.

RECOGNITION AND RISK ASSESSMENT

In the planning stages of a project, the potential for cold-related hazards must be considered in the site-specific Health and Safety Plan (HASP) and during risk assessment. The Field Safety Officer (FSO) must make decisions on the proper safety procedures and recommend them to the site manager. Each worker must evaluate the risk associated with his or her work and be actively alert to these hazards. Any site worker may stop work if safety procedures are not followed or the risk is too great.

Low Temperature + Wind Speed + Wetness = Injuries and Illness

The Cold Stress Equation (OSHA Card-3156) is a quick-reference tool provided on the Weston Portal.

Frostbite

Frostbite is the freezing of tissue and most commonly affects the toes, ears, fingers, and face. Frostbite occurs when an extremity loses heat faster than it can be replaced by the circulating blood. Frostbite may result from direct exposure to extreme cold or cool, high wind. Damp socks and shoes may contribute to frostbite of the toes.

Signs and symptoms of frostbite include:

- Cold, tingling, aching, or stinging feeling followed by numbness
- Skin color is red, purple, white, or very pale and is cold to the touch
- Blisters may be present (in severe cases)

Treatment for frostbite:

- Call for emergency medical assistance.
- Move the victim indoors and/or away from additional exposure to cold, wet, and wind.
- Wrap the affected area in a soft, clean cloth (sterile, if available).
- Give a warm drink (water or juices, not coffee, tea or alcohol). Do not allow the victim to smoke.
- Do not rub the frostbitten part (this may cause gangrene).
- Do not use ice, snow, gasoline or anything cold on the frostbitten area.
- Do not use heat lamps or hot water bottles to rewarm the frostbitten area.
- Do not place the frostbitten area near a hot stove.
- Do not break blisters.
- After rewarming, elevate the area and protect it from further injury.

Hypothermia

Hypothermia means “low heat” and is a potentially serious condition. Systemic hypothermia occurs when body heat loss exceeds body heat gain and the body core temperature falls below the normal 98.6°F. While some hypothermia cases are caused by extremely cold temperatures, most cases develop in air

temperatures between 30° and 50°F, especially when compounded with water immersion and/or windy conditions.

The victim of hypothermia may not know, or refuse to admit, that he or she is experiencing hypothermia. All personnel must be observant for these signs for themselves and for other team members. Hypothermia can include one or more of the following symptoms.

- Cool bluish skin
- Uncontrollable shivering
- Vague, slow, slurred speech
- Irritable, irrational, or confused behavior
- Memory lapses
- Clumsy movements, fumbling hands
- Fatigue or drowsiness

Below the critical body core temperature of 95°F, the body cannot produce enough heat by itself to recover. At this point, emergency measures must be taken to reverse the drop in core temperature. The victim may slip into unconsciousness and can die in less than 2 hours after the first signs of hypothermia are detected. Treatment and medical assistance are critical.

Treatment for hypothermia:

- Call for emergency medical assistance.
- Do not leave the victim alone.
- Prevent further heat loss by moving the person to a warmer location out of the wind, wet, and cold.
- Remove cold, wet clothing and replace with warm dry clothing or wrap the victim in blankets.
- If the victim is conscious, provide warm liquids, candy, or sweetened foods. Carbohydrates are the food most quickly transformed into heat and energy. Do not give the victim alcohol or caffeine.
- Have the person move their arms and legs to create muscle heat. If they are unable to move, place warm bottles or hot packs in the arm pits, groin, neck, and head. Do not rub the arms and legs or place the person in warm water.

Prevention and Protection

The following general guidelines are recommended for preventing or minimizing cold stress:

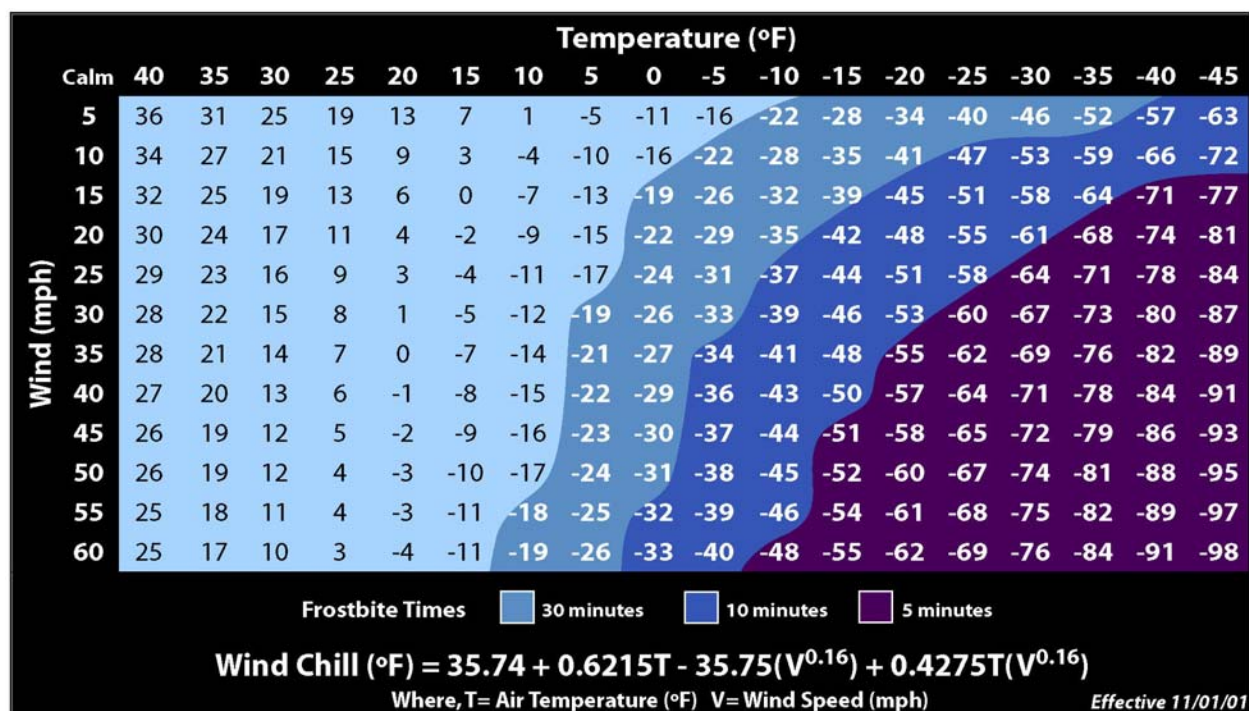
- Wear loose, layered clothing, masks, woolen scarves, and hats. Wear liners under hard hats
- Protect hands with gloves or mittens.
- Never touch cold metal with bare hands.
- Wear waterproof, slip-resistant, insulated boots
- Use chemical foot and hand warmers (commercially available) inside boots and gloves.
- In extreme cold, cover the mouth and nose with wool or fur to “pre-warm” the air you breathe.
- If wearing a face protector, remove it periodically to check for frostbite.

- Ensure that clothing remains secure around the body, especially at the neck and waist.
- If required to wear chemical protective clothing, remember that it generally does not afford protection against cold stress. In many instances, chemical protective clothing increases susceptibility. Dress carefully if both chemical protection and thermal insulation are required.
- Remove outer layers to avoid overheating and soaking clothing with perspiration; replace layers to avoid becoming chilled.
- Keep clothes dry by wearing water-resistant and wind-resistant clothing and outerwear.
- Wear clothing that will “breathe” or allow water vapor to escape.
- Eat well-balanced meals, ensure adequate intake of liquids and avoid alcoholic beverages. Drink warm sweet beverages and soups. Limit the intake of caffeinated drinks due to the diuretic and circulatory effects.
- Utilize available warm shelters and implement work-rest schedules.
- If warm shelters are not available, use cars/vehicles as shelter from the cold. (Ensure that tailpipes are not covered by heavy snowfall).
- Use radiant heaters to provide warmth (if using propane heaters ensure adequate ventilation to avoid carbon monoxide poisoning).
- Monitor yourself and others for changes in physical and mental condition.
- Use the buddy system or supervision to ensure constant protective observation.
- If heavy work must be done, resulting in sweating/wet clothing, take rest periods in heated shelters and change into dry clothing as necessary.
- New employees should not work full-time in the cold during the first days of employment until they become accustomed to the working conditions and the use of required protective clothing.
- Include the weight and bulkiness of clothing in estimating the required work performance and weights to be lifted by the worker.
- Arrange the work in such a way that sitting or standing still for long periods is minimized.
- Perform work protected from drafts to the greatest extent possible. If possible, shield the work area from wind.
- Instruct workers in safety and health procedures. The training program should include, as a minimum, instruction in:
 - Signs and symptoms of frostbite, impending hypothermia, or excessive cooling of the body
 - Proper use of clothing
 - Proper eating and drinking habits
 - Safe work practices
 - Proper rewarming procedures and appropriate first aid treatment
- Tables 1 and 2 should be consulted to adjust working schedules for wind chill conditions based on equivalent chill temperature (ECT). These tables are guidelines only; ambient temperatures and wind conditions should be monitored frequently and work schedules adjusted as required. If workers show signs or symptoms of cold stress, the work schedule must be adjusted, as required.

Work/Warming Regimen

Work should be performed in the warmest part of the day. If work is performed continuously in the cold or winter conditions or where rain or cool winds are expected, provide heated warming shelters, tents, cabins, or break rooms nearby. Encourage workers to use the shelter at regular intervals depending on the severity of the cold exposure. Table 2, Cold Work/Warmup Schedule for 4-Hour Shifts, provides guidance for working in severe cold weather. The onset of heavy shivering, the feeling of excessive fatigue, drowsiness, irritability, or euphoria are indications for immediate return to the shelter. Pain, numbness, or tingling in the extremities are indications for immediate return to the shelter. When entering the heated shelter, the outer layer of clothing should be removed and the remainder of the clothing loosened to permit sweat evaporation, or the worker should change into dry clothing. Never return to work in wet clothing.

Table 1. Wind Chill Chart



NWS/NOAA

Table 2. Cold Work/Warmup Schedule for 4-Hour Shifts

EQUIVALENT CHILL TEMPERATURE	MAXIMUM WORK PERIOD	NO. OF BREAKS
≥-24°F	Normal	1
-25° to -30°F	75 minutes	2
-31° to -35°F	55 minutes	3
-36° to -40°F	40 minutes	4
-41° to -45°F	30 minutes	5
≤-46°F	Stop work	Stop work

FLD 39 ILLUMINATION

RELATED FLDs

FLD 08 – Confined Space Entry Program
FLD 10 – Manual Lifting and Handling of Heavy Objects
FLD 12 – Housekeeping
FLD 13 – Structural Integrity
FLD 18 – Operation and Use of Boats
FLD 22 – Heavy Equipment Operation
FLD 23 – Cranes, Rigging, and Slings
FLD 33 – Demolition
FLD 38 – Hand and Power Hand Tools

PROCEDURE

While work is in progress, offices, facilities, access-ways, working areas, construction roads, etc., will be lighted by at least the minimum light intensities specified in Table 1.

Office lighting will be in accordance with American National Standards Institute (ANSI)/ Illuminating Engineering Society of North America (IESNA) RP-1.

Roadway lighting will be in accordance with ANSI/IESNA RP-8.

Marine lighting will be in accordance with ANSI/IESNA RP-12.

Means of Egress

- Means of egress will be illuminated, with emergency and non-emergency lighting, to provide a minimum of 1 footcandle (fc) (lumens per square foot [lm/ft^2]) (11 lux [lx], measured at the floor. (Reference NFPA 101)
- The illumination will be arranged so that the failure of any single lighting unit, including the burning out of an electric bulb, will not leave any area in total darkness.

Lamps and fixtures will be guarded and secured to preclude injury to personnel. Open fluorescent fixtures will be provided with wire guards, lenses, tube guards and locks, or safety sockets that require force in the horizontal axis to remove the lamp.

Lamps for general illumination shall be protected from accidental contact or breakage. Protection shall be provided by elevation of at least 7 ft (2.1 m) from normal working surface or suitable fixture or lamp holder with a guard.

TABLE 1 - MINIMUM LIGHTING REQUIREMENTS

Facility or Function	Illuminance – lx (lm/ft²)
Accessways	
– general indoor	55 (5)
– general outdoor	33 (3)
– exitways, walkways, ladders, stairs	110 (10)
Administrative areas (offices, drafting/meeting rooms, etc.)	540 (50)
Chemical laboratories	540 (50)
Construction Areas	
– general indoor	55 (5)
– general outdoor	33 (3)
– tunnels and general underground work areas, (minimum 110 lx required at tunnel and shaft heading during drilling, mucking, and scaling)	55 (5)
Conveyor routes	110 (10)
Docks and loading platforms	33 (3)
Elevators (freight and passenger)	215 (20)
First-aid stations and infirmaries	325 (30)
Maintenance/Operating Areas/Shops	
– vehicle maintenance shop	325 (30)
– carpentry shop	110 (10)
– outdoors field maintenance area	55 (5)
– refueling area, outdoors	55 (5)
– shops, fine detail work	540 (50)
– shops, medium detail work	325 (30)
– welding shop	325 (30)
Mechanical/electrical equipment rooms	110 (10)
Parking areas	33 (3)
Toilets, wash, and dressing rooms	110 (10)
Visitor areas	215 (20)
Warehouses and Storage Rooms/Areas	
– indoor stockroom, active/bulk storage	110 (10)
– indoor stockroom, inactive	55 (5)
– indoor rack storage	270 (25)
– outdoor storage	33 (3)
Work areas – general (not listed above)	325 (30)

FLD 49 SAFE STORAGE OF SAMPLES

REFERENCE

DOT Emergency Response Guide (ERG)

To ensure that multi-media samples collected in the course of WESTON work assignments are not stored in a manner that creates undue hazard to WESTON employees or others.

PROCEDURE

Samples that are transported from a WESTON work location must be classified and packaged in compliance with U.S. Department of Transportation (DOT) regulations or alternatively in accordance with International Air Transport Association (IATA) regulations. WESTON's manual of Procedures for Shipping and Transporting Dangerous Goods must be consulted to determine if the samples will be classified as either "environmental" or "hazardous materials" samples.

Environmental Samples

Environmental samples are not subject to DOT or IATA dangerous goods regulations and must be packaged to protect their integrity during transportation and temporary storage and should have appropriate chain-of-custody documentation. These samples may be brought to a WESTON office location or rented space to verify sample documentation and repackaging (e.g., with ice or cold packs). Minor spill clean-up capability is required.

Once secured for shipment, these samples can be temporarily stored for the next day ground or air shipment pick-up. Under no circumstances are samples to be stored beyond the time necessary to arrange for transportation to a laboratory.

Hazardous Materials Samples

These samples are subject to DOT and/or IATA dangerous goods regulations and must be packaged and labeled according to the appropriate regulations, including completed chain-of-custody documentation prior to being transported from the WESTON work site. WESTON drivers must have the documentation for the samples and a DOT Emergency Response Guide (ERG) readily available in the vehicle. The ERG is available on-line at: <http://hazmat.dot.gov/pubs/erg/gydebook.htm> and appropriate sections can be copied to accompany samples being transported by vehicles driven by WESTON employees.

Under normal circumstances these samples should be shipped from the field and never brought back to a WESTON office location or into a rented space. If it is not possible to ship the samples from the field during the same day they are collected, a properly packaged, labeled, and sealed sample shipping container may be brought back to a WESTON office location for shipment to a laboratory the next business day - provided the temporary storage location is secure from access by any personnel who are not trained in shipping hazardous materials. Under no circumstances are samples to be stored in rented space; if necessary, secure temporary storage in a locked vehicle may be authorized. Note that some office leases do not permit the storage of hazardous materials and the lease will govern whether such materials can be stored overnight.

INSPECTION FOLLOW-UP

Shipping procedures for samples should be included in the site-specific health and safety plan (HASP) and reviewed for compliance with these procedures prior to approval. EHS audits will include a review to sample shipping and storage procedures.