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# REMEDIATION ACTION HEALTH AND SAFETY PLAN

## HUDSON RIVER PCBs SUPERFUND SITE

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*Prepared For:*

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# RA HEALTH AND SAFETY PLAN

## TABLE OF CONTENTS

	Page
<b>LIST OF ACRONYMS .....</b>	<b>ix</b>
<b>SECTION 1 INTRODUCTION.....</b>	<b>1-1</b>
1.1 OBJECTIVES.....	1-2
1.2 SITE SETTING .....	1-3
1.3 ZERO INCIDENT PHILOSOPHY .....	1-4
1.4 REMEDIAL ACTION ACTIVITIES.....	1-5
1.4.1 Contract 1 – Phase 1 Facility Site Work Construction.....	1-5
1.4.1.1 General Civil Work .....	1-6
1.4.1.2 Wharf Area Construction .....	1-6
1.4.1.3 Work Support Marina.....	1-6
1.4.1.4 River Mooring Installations.....	1-6
1.4.2 Contract 2 – Phase 1 Rail Yard Construction.....	1-6
1.4.2.1 Rail Yard Construction Work.....	1-6
1.4.2.2 Rail Yard Facilities Work.....	1-7
1.4.3 Contract 3A – Phase 1 Processing Facility Construction.....	1-7
1.4.4 Contract 3B – Phase 1 Processing Facility Operations .....	1-7
1.4.5 Contract 4 – Phase 1 Dredging Operations .....	1-8
1.4.5.1 Sheet Pile Installation.....	1-8
1.4.5.2 Rock Dike Installation.....	1-8
1.4.5.3 Dredging.....	1-8
1.4.5.4 Backfill, Capping, and Shoreline Restoration .....	1-8
1.4.6 Contract 5 – Phase 1 Habitat Construction.....	1-8
1.4.7 Contract 6 – Phase 1 Rail Yard Operations.....	1-8
1.4.7.1 Rail Operations.....	1-8
1.4.7.2 Rail Yard Facilities.....	1-9
1.4.7.3 Rail Car Loading Facility .....	1-9
1.4.8 Remedial Action Monitoring.....	1-9
1.4.8.1 Sediment.....	1-9
1.4.8.2 Fish .....	1-10
1.4.8.3 Water Column .....	1-10
1.5 REMEDIAL DESIGN SUPPORT ACTIVITIES .....	1-11
1.5.1 Engineering Data Collection .....	1-11
1.5.1.1 Sediment Sampling.....	1-12
1.5.1.2 Debris and Obstruction Survey .....	1-12
1.5.1.3 Geotechnical Characterization of Sediments.....	1-12

# RA HEALTH AND SAFETY PLAN

## TABLE OF CONTENTS (CONTINUED)

	<b>Page</b>
1.5.1.4 Sub-Bottom Physical Characterization.....	1-12
1.5.1.5 Disposal Characterization.....	1-13
1.5.1.6 Backfill Source Material Identification and Characterization.....	1-13
1.5.2 Base-Mapping.....	1-13
1.5.3 Baseline Monitoring.....	1-13
1.5.4 Habitat Delineation and Assessment.....	1-14
1.5.5 Cultural and Archaeological Resources Assessment .....	1-15
1.5.6 Sediment Core Collection.....	1-15
1.5.7 Core Processing.....	1-15
1.6 SCHEDULE FOR FIELD ACTIVITIES .....	1-16
<b>SECTION 2 SITE SAFETY PERSONNEL .....</b>	<b>2-1</b>
2.1 CONTACT INFORMATION FOR SITE SAFETY PERSONNEL .....	2-1
2.2 LEAD SITE SAFETY PERSONNEL .....	2-1
2.2.1 Safety Manager (for CM).....	2-2
2.2.2 Safety Representatives (for CM).....	2-4
2.2.3 Site Safety Officer / Site Safety and Health Officer (for Contractor) .....	2-5
2.2.4 Site Safety Representative (for Contractor) .....	2-7
2.2.5 Project Workers.....	2-8
2.2.6 Processing/Operations Facility, Dredging and Habitat Construction Personnel .....	2-8
<b>SECTION 3 SITE LAYOUT AND CONTROL PLAN .....</b>	<b>3-1</b>
3.1 GENERAL.....	3-1
3.2 RIVER WORK.....	3-1
<b>SECTION 4 POTENTIAL HEALTH AND SAFETY HAZARDS AND CONTROLS.....</b>	<b>4-1</b>
4.1 FIELD HAZARDS AND CONTROL MEASURES .....	4-1
4.1.1 Contract 1 – Phase 1 Facility Site Work Construction.....	4-1
4.1.2 Contract 2 – Phase 1 Rail Yard Construction.....	4-3
4.1.3 Contract 3A – Phase 1 Processing Facility Construction.....	4-4
4.1.4 Contract 3B – Phase 1 Processing Facility Operations .....	4-5
4.1.5 Contract 4 – Phase 1 Dredging Operations .....	4-6

# RA HEALTH AND SAFETY PLAN

## TABLE OF CONTENTS (CONTINUED)

	<b>Page</b>
4.1.6 Contract 5 – Phase 1 Habitat Construction.....	4-8
4.1.7 Contract 6 – Phase 1 Rail Yard Operations.....	4-9
4.1.8 Support Activities.....	4-10
4.2 GENERAL HAZARDS AND CONTROL MEASURES.....	4-11
4.3 WATER SAFETY.....	4-16
4.4 LOCKOUT/TAGOUT PROCEDURES.....	4-17
4.5 FIRE PREVENTION/HOT WORK PROCEDURES.....	4-18
4.6 CONFINED SPACE PROCEDURES.....	4-19
4.7 FALL PROTECTION PROCEDURES.....	4-20
4.8 CRANES, HOISTING, AND RIGGING.....	4-23
4.9 SCAFFOLDING.....	4-23
4.10 ELECTRICAL SAFETY.....	4-24
4.11 HAND AND POWER TOOLS.....	4-25
4.12 LADDER SAFETY.....	4-25
4.13 HOUSEKEEPING.....	4-26
4.14 STEEL ERECTION.....	4-26
4.15 DIVING SAFETY.....	4-27
4.15.1 General.....	4-28
4.15.2 Training.....	4-29
4.15.3 Dive Planning.....	4-29
4.15.4 Dive Site Preparation.....	4-29
4.15.5 Equipment Inspection.....	4-30
4.15.6 Water Entry and Exit.....	4-31
4.15.7 Emergency Procedures.....	4-31
4.16 SOFT / HARD LINES.....	4-31
4.17 ENVIRONMENTAL HAZARDS.....	4-32
4.17.1 Heat Stress.....	4-32

# RA HEALTH AND SAFETY PLAN

## TABLE OF CONTENTS (CONTINUED)

	<b>Page</b>
4.17.2 Cold Stress.....	4-35
4.17.3. Biological Hazards .....	4-38
4.17.3.1 Tick-Borne Disease .....	4-38
4.17.3.2 Poisonous Plants.....	4-39
4.17.3.3 Snakes.....	4-39
4.17.3.4 Spiders.....	4-40
4.17.3.5 Mosquitoes .....	4-40
4.18 LIFTING SAFETY.....	4-41
4.19 POLYCHLORINATED BIPHENYLS (PCBs).....	4-42
4.20 DRILLING OPERATIONS.....	4-42
4.21 ELECTROFISHING.....	4-47
4.22 WORKING ON A BRIDGE .....	4-48
<b>SECTION 5 PERSONAL PROTECTIVE EQUIPMENT.....</b>	<b>5-1</b>
5.1 LEVELS OF PROTECTION .....	5-1
5.2 LEVEL D PROTECTION .....	5-2
5.2.1 Modified Level D Protection.....	5-3
5.2.2 Level C Protection.....	5-3
5.3 SELECTION OF PPE.....	5-3
5.4 SITE RESPIRATORY PROTECTION PROGRAM.....	5-3
5.5 USING PPE .....	5-4
5.5.1 Donning Procedures .....	5-4
5.5.2 Doffing Procedures.....	5-5
5.5.3 Selection Matrix .....	5-5
<b>SECTION 6 AIR MONITORING AND ACTION LEVELS .....</b>	<b>6-1</b>
6.1 AIR MONITORING.....	6-1
6.2 POLYCHLORINATED BIPHENYLS .....	6-1
6.3 AIRBORNE PARTICULATES (DUST).....	6-1

# RA HEALTH AND SAFETY PLAN

## TABLE OF CONTENTS (CONTINUED)

	<b>Page</b>
6.4 GASOLINE AND SOLVENTS .....	6-1
6.5 HYDROGEN SULFIDE .....	6-2
6.6 RESPIRATORY HAZARD ASSESSMENT .....	6-2
6.7 ACTION LEVELS .....	6-2
<b>SECTION 7 MEDICAL MONITORING.....</b>	<b>7-1</b>
7.1 MEDICAL SURVEILLANCE PROGRAM .....	7-1
7.1.1 Pre-Placement Medical Examination .....	7-1
7.2 OTHER MEDICAL EXAMINATIONS .....	7-1
7.3 MEDICAL RESTRICTION .....	7-2
<b>SECTION 8 PERSONNEL TRAINING.....</b>	<b>8-1</b>
8.1 GENERAL.....	8-1
8.2 40-HOUR OSHA HAZWOPER COURSE.....	8-2
8.3 SUPERVISOR TRAINING.....	8-3
8.4 SITE-SPECIFIC TRAINING .....	8-3
8.4.1 Visitors .....	8-3
8.4.2 Safety “Toolbox” Meetings.....	8-3
8.5 FIRST AID AND CPR.....	8-4
8.6 BOAT OPERATORS .....	8-4
8.7 COMPETENT PERSON .....	8-4
<b>SECTION 9 DECONTAMINATION.....</b>	<b>9-1</b>
9.1 CONTAMINATION CONTROL ZONES.....	9-1
9.1.1 Exclusion Zone.....	9-1
9.1.2 Contamination Reduction Zone.....	9-1
9.1.3 Support Zone .....	9-1

# RA HEALTH AND SAFETY PLAN

## TABLE OF CONTENTS (CONTINUED)

	<b>Page</b>
9.2 PERSONNEL DECONTAMINATION.....	9-1
9.3 EQUIPMENT DECONTAMINATION.....	9-2
9.3.1 PPE Decontamination.....	9-2
<b>SECTION 10 EMERGENCY RESPONSE.....</b>	<b>10-1</b>
10.1 GENERAL.....	10-1
10.2 EMERGENCY RESPONSE .....	10-1
10.2.1 Notifications .....	10-1
10.2.2 Fire Response .....	10-3
10.2.3 Spill Prevention/Response.....	10-4
10.2.3.1 Spill Response Procedures – Processing Facility.....	10-4
10.2.3.2 Spill Response Procedures – In River Activities.....	10-5
10.2.3.3 Spill Reporting Requirements .....	10-6
10.3 EMERGENCY INFORMATION .....	10-8
10.3.1 First Aid.....	10-8
10.3.1.1 Emergency Care Steps.....	10-8
10.3.1.2 Inhalation.....	10-9
10.3.1.3 Ingestion .....	10-9
10.3.1.4 Skin Contact .....	10-9
10.3.1.5 Eye Contact .....	10-9
10.3.2 Medical Emergency – Processing Facility .....	10-9
10.3.3 Medical Emergency – Wharf Area.....	10-10
10.3.4 Medical Emergency – Dredging Areas .....	10-10
10.3.5 Water Emergency – Man Overboard.....	10-10
10.3.6 Emergency Contacts.....	10-10
10.4 REPORTING INJURIES, ILLNESSES, AND NEAR-MISS INCIDENTS .....	10-11
<b>SECTION 11 AUDITS AND CORRECTIVE ACTION.....</b>	<b>11-1</b>
11.1 FORMAL SITE AUDIT.....	11-1
11.2 DAILY SITE WALK CHECKLIST .....	11-1

# RA HEALTH AND SAFETY PLAN

## TABLE OF CONTENTS (CONTINUED)

	<b>Page</b>
11.3 ENFORCEMENT.....	11-1
11.4 NOTICE OF VIOLATION.....	11-1
<b>SECTION 12 REFERENCES.....</b>	<b>12-1</b>

### LIST OF TABLES

Table 1 Work/Rest Schedule .....	4-34
Table 2 Wind Chill Temperature Chart .....	4-36
Table 3 PPE Selection Matrix.....	5-5
Table 4 Competent Person and Activity Hazards Analysis Requirements.....	8-4

### LIST OF FIGURES

Figure 1 Upper Hudson River
Figure 2 Phase 1 Dredge Areas
Figure 3 Site Security Map
Figure 4 Work Support Marina
Figure 5 Hospital Location Map

### LIST OF ATTACHMENTS

Attachment A Emergency and Site Safety Personnel Telephone Numbers
Attachment B Health And Safety Plan Acknowledgment
Attachment C Safety Toolbox Meeting Log
Attachment D Hot Work Permit
Attachment E Confined Space Entry Permit
Attachment F Incident/Near-Miss Investigation Report
Attachment G Pre-drilling/Subsurface Checklist for Intrusive Fieldwork

# **RA HEALTH AND SAFETY PLAN**

## **TABLE OF CONTENTS (CONTINUED)**

### **LIST OF APPENDICES**

**APPENDIX A CONTRACTOR HEALTH AND SAFETY PLANS**

**APPENDIX B GE EHS REQUIREMENTS**

**APPENDIX C EXAMPLE OF A DIVING SAFETY MANUAL FOR SCIENTIFIC  
DIVING**

# RA HEALTH AND SAFETY PLAN

## LIST OF ACRONYMS

°F	Degrees Fahrenheit (°F)
µG/M3	Micrograms per Cubic Meter
AAUS	American Academy of Underwater Sciences
ACGIH	American Conference of Governmental Industrial Hygienists
AED	Automated External Defibrillator
ANSI	American National Standards Institute
CARA	Cultural and Archaeological Resources Assessment
CAZ	Controlled Access Zone
CD	Consent Decree
CDZ	Controlled Decking Zone
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CHST	Construction Health and Safety Technician
CIH	Certified Industrial Hygienist
CII	Construction Industry Institute
CM	Construction Manager
COC	Constituents of Concern
CPR	Cardiopulmonary Resuscitation
CRZ	Contaminant Reduction Zone
CSP	Certified Safety Professional
dBA	Decibels on the A-scale
DEET	Diethyl toluamide
DGPS	Differential Global Positioning System
DSO	Diving Safety Officer
EDC	Engineering Data Collection
eDMS	Environmental Data Management System
EHS	Environmental, Health and Safety
EMS	Emergency Medical Services
EPA	United States Environmental Protection Agency
EPS	Engineering Performance Standards
EZ	Exclusion Zone

# RA HEALTH AND SAFETY PLAN

## LIST OF ACRONYMS (CONTINUED)

FCE	Functional Capacity Examination
FDR	Final Design Report
FWPCA	Federal Water Pollution Control Act
GE	General Electric Company
GFI	Ground Fault Circuit Interruption
HASP	Health and Safety Plan
HAZWOPER	Hazardous Waste Operations and Emergency Response
HDA	Habitat Delineation and Assessment
HEPA	High-Efficiency Particulate Air
JSA	Job Safety Analysis
LED	Light-Emitting Diode
LOTO	Lockout/Tagout
MG/M <sup>3</sup>	Milligram per Cubic Meter
MPA	Mass per Unit Area
MPH	Miles per Hour
MSDS	Material Safety Data Sheet
NFPA	National Fire Protection Association
NIOSH	National Institute For Occupational Safety and Health
NOV	Notice of Violation
NRC	National Response Center
NRR	Noise Reduction Ratio
NYSCC	New York State Canal Corporation
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
OHST	Occupational Health and Safety Technician
OPA	Oil Pollution Act
OSHA	Occupational Safety and Health Administration
PADI	Professional Association of Diving Instructors
PCB	Polychlorinated Biphenyls
PEL	Permissible Exposure Limit
PFD	Personal Flotation Device

# RA HEALTH AND SAFETY PLAN

## LIST OF ACRONYMS (CONTINUED)

PPE	Personal Protective Equipment
PRCS	Permit Required Confined Spaces
PSI	Pounds per Square Inch
PSM	Project Safety Manager
PVC	Polyvinyl Chloride
QAPP	Quality Assurance Project Plan
QoLPS	Quality of Life Performance Standards
R&D	Receiving and Departure
RA	Remedial Action
RA CHASP	Remedial Action Community Health and Safety Plan
RA HASP	Remedial Action Health and Safety Plan
RCRA	Resource Conservation and Recovery Act
RD	Remedial Design
RIP	Repair In Place
RMSF	Rocky Mountain Spotted Fever
ROD	Record of Decision
RQ	Reportable Quantity
SENRAAC	Steel Erection Negotiated Rule Advisory Committee
SMS	Safety Monitor System
SOP	Standard Operating Procedures
SOW	Statement of Work
SPCC	Spill Prevention, Control and Countermeasure
SSAP	Sediment Sampling and Analysis Plan
SSHO	Site Safety and Health Officer
SSI	Scuba Schools International
SSO	Site Safety Officer
SSR	Site Safety Representatives
START	Supervisory Training in Accident Reduction Techniques
SZ	Support Zone
TLV	Threshold Limit Value
TSCA	Toxic Substances Control Act

# RA HEALTH AND SAFETY PLAN

## LIST OF ACRONYMS (CONTINUED)

TWA	Time-Weighted Average
UFPO	Underground Facilities Protection Organization
USCG	United States Coast Guard
USEPA	United States Environmental Protection Agency
VHF	Very-High-Frequency

# RA HEALTH AND SAFETY PLAN

## SECTION 1

### INTRODUCTION

On October 6, 2005, a Consent Decree (CD) for the Remedial Action (RA) in the Upper Hudson River, executed by the General Electric Company (GE) and the United States Environmental Protection Agency (EPA), was filed in federal district court (Civil Action No. 1:05-CV-1270; EPA/GE, 2005). After an extensive public review and comment period, the court approved and entered the RA CD as a final judgment on November 2, 2006, when it went into effect.

GE prepared the *Phase 1 Final Design Report* (Phase 1 FDR) (BBL, 2006) and submitted it to EPA on March 21, 2006. On May 31, 2006, EPA approved the portion of the Phase 1 FDR that included the civil site work and rail yard construction (Contracts 1 and 2). On September 14, 2006, EPA approved the portions of the Phase 1 FDR that included construction and operation of the sediment processing facility (Contracts 3A and 3B) and rail yard operations (Contract 6). Subsequently, based on numerous discussions between GE and EPA, the Phase 1 FDR was modified, especially in regard to dredging operations (Contract 4) and habitat construction (Contract 5), through numerous revised plans and specifications and other documents reflecting the parties' agreements. On January 25, 2008, EPA approved all remaining portions of the Phase 1 FDR, so that that plan was approved in its entirety.

Included as Appendix B to the CD is the Statement of Work (SOW) for Remedial Action and Operations, Maintenance and Monitoring, which sets forth a number of requirements for implementing the remedial action set forth in the Record of Decision (ROD). Section 2.3.2.3 of the SOW requires that an updated *Remedial Action Health and Safety Plan* (RA HASP) be submitted concurrently with the *RA Work Plan for Phase 1 Dredging and Facility Operations* (RAWP #3) (Parsons 2008). This document is being submitted to satisfy that requirement.

This RA HASP presents the health and safety plan that will govern remedial design (RD) and remedial action field work to be performed in support of the Hudson River PCBs Superfund Site remedial activities described in the Phase 1 FDR, including:

- Facility site work construction;
- Rail yard construction;
- Processing facility construction and operations;
- Dredging operations;
- Habitat construction;

# RA HEALTH AND SAFETY PLAN

- Rail yard operations; and
- RA Monitoring – sediment, fish, and water column.

In addition, in accordance with Section 2.3.2.3 of the SOW, GE has updated the *Revised Health and Safety Plan* (Revised HASP) prepared by Blasland, Bouck and Lee, Inc. (BBL) in 2003 for design support activities submitted pursuant to the RD AOC and has incorporated that document into this RA HASP. Thus, this RA HASP supersedes the Revised HASP for design support activities. RD support activities covered by this RA HASP include:

- Engineering data collection (EDC) ;
- Base-mapping;
- Baseline monitoring;
- Habitat delineation and assessment (HDA);
- Cultural and archaeological resources assessment (CARA);
- Sediment core collection; and
- Sediment core processing.

Additional worker HASPs will be prepared by each contractor and will be available upon request.

A separate *Remedial Action Community Health and Safety Plan* (RA CHASP) (Parsons, 2007) has been developed to address community health and safety concerns and to inform the community of emergency procedures during remedial activities.

This RA HASP is available for review at the USEPA's Hudson River Field Office at 421 Lower Main Street in Fort Edward, New York; at information repositories located in Glens Falls, Saratoga Springs, Albany, Poughkeepsie, and New York City, New York; as well as on the USEPA's website, available at: [www.epa.gov/hudson](http://www.epa.gov/hudson).

If additional field activities are identified during the course of the remedial activities that are not covered by this RA HASP, GE will develop and submit to the USEPA, addenda to this RA HASP to cover such additional field activities. Upon USEPA review of such addenda, the addenda will be available for review at the same locations noted above, and the provisions of such addenda will be implemented.

## 1.1 OBJECTIVES

The project goal is zero incidents and zero injuries with work tasks designed to minimize or eliminate hazards to personnel, equipment, the environment, and the general public. No individuals shall perform tasks that may endanger their own safety and health or that of others. In other words, all individuals are empowered to have "stop work authority".

# RA HEALTH AND SAFETY PLAN

This RA HASP outlines safety and health requirements and guidelines developed for project work. When implemented, these requirements will help protect site personnel, visitors, the public, and the environment from exposure to potential safety and health hazards.

This RA HASP will be updated as conditions or situations change.

The objectives of this RA HASP are to:

- Identify the physical, chemical, and biological hazards potentially present during field work associated with the RA Work Plan;
- Prescribe the protective measures necessary to control those hazards;
- Define emergency procedures; and
- Prescribe training and medical qualification criteria for site personnel.

This RA HASP must be reviewed by all contractor and subcontractor managers, supervisors, foremen, and safety personnel. All other project personnel performing field activities will receive a site-specific project safety orientation summarizing the content of the RA HASP. If requested, project personnel will be provided the time necessary to review the entire RA HASP. All personnel will be required to sign the appropriate documentation acknowledging an understanding of the RA HASP. Visitors will also be required to receive an abbreviated project safety orientation, in addition to being escorted by an authorized project team member when going on the site.

## 1.2 SITE SETTING

The Upper Hudson River is defined as the section of river upstream from the Federal Dam at Troy, New York. The ROD calls for, among other things, a remedial action to remove and dispose of sediments from the Upper Hudson River. Sediments to be removed are defined based on the PCB mass per unit area (MPA) and surface concentration or characteristic criteria (EPA, 2002). The location of each section is described below and presented on Figure 1:

- **River Section 1:** Former location of Fort Edward Dam to Thompson Island Dam (approximately 6.3 miles);
- **River Section 2:** Thompson Island Dam to Northumberland Dam (approximately 5.1 miles); and
- **River Section 3:** Northumberland Dam to the Federal Dam at Troy (approximately 29.5 miles).

The remedial action is to be conducted in two phases, designated Phase 1 and Phase 2. Phase 1 is defined as the first year of dredging and will be completed in a portion of River Section 1. Phase 1 also includes preparation of the land-based sediment processing facility. Phase 2 covers the remaining dredging in the three river sections.

# RA HEALTH AND SAFETY PLAN

## 1.3 ZERO INCIDENT PHILOSOPHY

This RA HASP uses the Zero Incident management approach. The safety goal for this project is zero incidents, zero injuries. The Zero Incident philosophy originated with a study by the Construction Industry Institute (CII), which identified specific control measures shown to dramatically reduce the probability of incidents. These control measures, known as Zero Incident Techniques, provide the framework for this RA HASP, and the Project Team’s proactive approach to manage the interrelated areas of safety, health, environment, and risk management. The definition of an incident is any unplanned or unexpected event that results in or has the potential to result in (i.e., near-miss incident) a personal injury, property damage or environmental release.

To ensure the success of the RA HASP, the project safety culture must be dynamic and evolving. This begins with training all management personnel in the foundations and philosophy of the Zero Incident Techniques and through Supervisory Training in Accident Reduction Techniques, known as the START program. This training lays the groundwork for a successful project by creating accountability and responsibility for the safety and risk process with all individuals. The nine focus areas for our success are:

<b>Zero Incident Techniques: A Snapshot of What and Why</b>		
<b>Key Technique</b>		<b>What and Why</b>
1	Demonstrated Management Commitment	All levels of management consistently display their commitment to the safety management process. As organization leaders, managers are role models whose actions send a strong message to employees.
2	Staffing for Safety	Each company funds a full-time lead safety person, either a site safety officer (SSO) or site safety and health officer (SSHO), in addition to site safety representatives (SSRs) as required, to assist in implementing and administering the RA HASP. The safety personnel consult with line organizations, helping to emphasize that safety is the responsibility of each employee on the project, not just the safety department.
3	Safety Planning – Pre-project/Pre-task	Planning safety into design and construction by using activity hazards analyses are key to eliminating incidents in the workplace. Planning job tasks with safety as a key component raises safety awareness of supervisors and employees. Pre-task planning improves productivity and reduces the negative impact of direct and indirect costs of incidents.
4	Safety Training and Education	Orientations and training sessions are conducted at all levels of an organization, as appropriate. Specialized training is also conducted to provide specific knowledge about hazardous work activities. Ongoing safety orientation and training gives employees the knowledge and skills to complete their job tasks without incident.

# RA HEALTH AND SAFETY PLAN

<b>Zero Incident Techniques: A Snapshot of What and Why</b>		
	<b>Key Technique</b>	<b>What and Why</b>
5	Worker Involvement and Participation	Empowering employees to identify hazards in the workplace is a valuable tool to increase safety awareness. Employee observation programs drive the behavior-based process. When employees identify and have the ability to correct hazards in the workplace, safety motivation and awareness increase and fewer incidents occur.
6	Recognition and Rewards	Employee recognition programs to reward and recognize employees for safe behavior can be based on individual or group accomplishments. Safe behavior is positively reinforced through management involvement, personal contact, communication, and training.
7	Subcontractor Management	Each organization must ensure that subcontractors comply with safety and health rules and regulations in accordance with contractual requirements. Careful management of subcontractor safety reduces incidents on the jobsite, which prevents injury and damage to property.
8	Incident Reporting and Investigation	Each organization must investigate incidents immediately and report to the appropriate personnel. The investigation process includes root cause determination and recommendations to prevent future occurrences. “Near misses” are important learning experiences and will be investigated as actual incidents.
9	Drug and Alcohol Testing	Site project personnel are tested for drugs/alcohol: pre-employment, post-accident, random and reasonable suspicion. Testing employees for drugs and alcohol reduces the likelihood of serious incidents as a result of workers being impaired while working on a project.

## 1.4 REMEDIAL ACTION ACTIVITIES

A description of the tasks expected to be completed under each RA activity listed on page 1-1 above is presented in the FDR, with each such potential field activity summarized in the following subsections. The descriptions of these potential field activities are general, since the specific field activities are described in more detail in the contractor HASP submitted by each contractor performing the work.

### 1.4.1 Contract 1 – Phase 1 Facility Site Work Construction

- General civil work;
- Wharf area construction;
- Development of a work support marina; and
- River mooring installation.

These descriptions are currently general; the actual need for and scope of these activities will be specified in a contractor HASP to be prepared by the contractor and submitted for construction manager (CM) review and approval.

# **RA HEALTH AND SAFETY PLAN**

## **1.4.1.1 General Civil Work**

Initial site preparation, such as clearing, grubbing, grading, and fencing, will take place before developing the property for use as a sediment processing/transfer facility. Primary utilities from main line locations to secondary connections points will be extended to the site. General activities shall include earthwork (i.e., cut and fill, general fill and compaction); installation of the rail yard drainage layer (i.e., liner, sand, piping, and geotextile) and sub-ballast, along with the corresponding drainage; construction of site access roads; asphalt paving of roads, storage areas and decontamination pads; installation of box culverts over Bond Creek and the Diversion Canal; concrete paving; and installation of the storm water management system, including sumps, pumps, piping, storage tanks, controls, and foundations.

## **1.4.1.2 Wharf Area Construction**

Wharf area construction will involve clearing, grubbing, excavation, and earthwork; pile installation; revetment construction and rip-rap installation; construction of the wharf structural steel superstructure and framework; forming and installation of the concrete deck and its rails; concrete paving in the access area, including storm water control piping and trenches; construction of the decontamination areas; and the extension of primary utilities from main line locations to secondary connection points.

## **1.4.1.3 Work Support Marina**

Construction of the small craft marina will involve clearing and grubbing; earthwork (cut and fill, general fill and compaction); construction of site access roads; grading of parking areas; extending primary utilities to secondary connections; installation of the floating dock; and installation of dock anchors.

## **1.4.1.4 River Mooring Installations**

River mooring installations will include one turning dolphin and four mooring dolphins located south of Lock 7.

## **1.4.2 Contract 2 – Phase 1 Rail Yard Construction**

The Phase 1 rail yard construction shall consist of activities required to construct rail yard track and facilities on both GE and Canadian Pacific Railway properties. Additional breakdown of these activities include but are not limited to the following:

### **1.4.2.1 Rail Yard Construction Work**

Rail yard construction work will involve the construction of ballasted track and special work (on prepared sub-grade and/or sub-ballast by others under Contract 1, Phase 1 Facility Site Work Construction). Activities to be provided by the rail yard contractor will include but are not limited to installation of bottom ballast for all track and special track work; installation of ties,

## **RA HEALTH AND SAFETY PLAN**

rail, and other track material required to construct ballasted jointed and/or relay welded track; construct new welded rail track; provide required “cut over” ballasted welded special work on Canadian Pacific Railway property as required; surface, align and stabilize ballasted track and special work; and construct low density at grade crossing.

### **1.4.2.2 Rail Yard Facilities Work**

Rail yard facilities work will involve construction on both GE and Canadian Pacific Railway property. Activities performed by the railroad contractor on the project site shall include but not be limited to constructing an engine house, repair track facility, and weigh-in-motion scale.

Activities performed by the railroad contractor on Canadian Pacific Railway property shall include but not be limited to constructing a “yard air” facility.

### **1.4.3 Contract 3A – Phase 1 Processing Facility Construction**

The Phase 1 Processing Facility Construction work shall consist of activities for the supply and installation of processing equipment including supply, construction, and installation of foundations, equipment pads, enclosures, containment structures, piping, mechanical, electrical, instrumentation, and start-up commissioning.

Process facility equipment construction will involve the construction of the coarse material separation area; installation of the trommel screen, tanks, and pumps; installation of hydrocyclones, screens, tanks, and associated pumps; installation of piping, electrical systems, controls, and related accessories; construction of the process tank area; construction of foundations, containment slabs, and curbing; installation of the filter press system and polymer system; construction of the process water treatment area; and construction of the treatment building.

### **1.4.4 Contract 3B – Phase 1 Processing Facility Operations**

Operations of the facility will include but not be limited to off loading, dewatering, and staging of dredged sediments and debris, the collection and treatment of residual water and storm water, and general operation and maintenance activities.

Operating the process facility equipment will involve operating and maintaining the process facility system, the coarse material separation system, the dewatering system, the water treatment system (process and storm water), the storm water management system, the stockpile storage area (management and maintenance), material handling including stockpiling, on-site transportation of coarse material, debris, and filter cake; operating and managing the decontamination station; and maintaining the haul road.

# **RA HEALTH AND SAFETY PLAN**

## **1.4.5 Contract 4 – Phase 1 Dredging Operations**

The Phase 1 dredging operation shall consist of activities related to the dredging of materials from the river and associated waterways and the subsequent backfilling and capping of the dredged areas. These activities include but are not limited to:

### **1.4.5.1 Sheet Pile Installation**

Installing and removing sheet piles on the east side of Rogers Island and Griffin Island.

### **1.4.5.2 Rock Dike Installation**

Installing and removing rock dike on the north end of Rogers Island.

### **1.4.5.3 Dredging**

The dredging operation will involve clearing overhanging vegetation; debris removal; inventory and residual dredging with mechanical dredges; operate and maintain tugs, barges, support boats, and fuel boats as needed; transport dredged sediments to site wharf; and install silt curtains and other resuspension controls as needed.

### **1.4.5.4 Backfill, Capping, and Shoreline Restoration**

Backfill, capping, and shoreline restoration will involve the use of barges, tugs, work boats, and other equipment for placing materials as specified. Backfill material will be transported by barge to the designated area for placement and shoreline stabilization as needed.

## **1.4.6 Contract 5 – Phase 1 Habitat Construction**

The Phase 1 habitat construction consists of activities related to planting specified vegetation in habitat construction areas.

## **1.4.7 Contract 6 – Phase 1 Rail Yard Operations**

Phase 1 rail yard operations shall consist of activities required to load outbound trains and receive inbound empty trains.

Rail yard and rail car loading area activities include but are not limited to the following:

### **1.4.7.1 Rail Operations**

The rail yard operator will switch empty and loaded rail cars on and off Track 1 on Canadian Pacific Railway property. Rail cars to be switched on and off this track will consist of unit trains up to 81 cars in length and other miscellaneous freight cars destined for the material unloading track or any other track on the project site. In addition, on Canadian Pacific Railway property the rail yard operator will be responsible for inspecting and repairing the train air supply and

# **RA HEALTH AND SAFETY PLAN**

associated appurtenances that provide train air to the south end of the Repair In Place (RIP) tracks.

The rail yard operator will switch empty and loaded rail cars on and off tracks on the project site. This includes the ladder tracks, receiving and departure (R&D) tracks, set out track, loading yard/scale lead, loading track(s), material track, RIP track, and engine house track. Rail cars to be switched on and off this track will consist of unit trains up to 81 cars in length and other miscellaneous freight cars destined for material unloading track. The operator will perform an inspection of all inbound rail cars. The operator will weigh inbound empty and outbound loaded rail cars as required. The operator will assemble, inspect, and make necessary repairs to outbound loaded rail cars to successfully perform a terminal test. The operator will be responsible for inspecting and repairing all track, special track work, road crossings, car air supply, and other track and mechanical appliances.

## **1.4.7.2 Rail Yard Facilities**

The operator will inspect, maintain, and operate an engine house, track RIP and weigh-in-motion scale that support the project. The operator will also maintain facilities and associated tools, machinery, heavy equipment, and automotive equipment (trucks) in a state of good repair.

## **1.4.7.3 Rail Car Loading Facility**

Functions to be performed at the rail car loading facility include activities associated with loading rail cars. Depending on whether a lid or wrap system is used, this could involve removal of lids from empty rail cars, lining of empty rail cars, folding and securing of car liners, and placing and locking lids on loaded cars. The exterior of rail cars will be cleaned as needed, inspected and then released to rail yard crews for movement back to rail yard.

## **1.4.8 Remedial Action Monitoring**

Different types of sampling will be required for analysis and material characterization. Soil sampling activities will include the installation of soil borings at specified locations for the collection of soil samples. Soil borings may involve the use of hollow-stem auger drilling equipment and/or the use of direct-push type boring equipment (Geoprobe<sup>®</sup> or equivalent). Control measures for operating soil boring equipment are described in Section 4.20.

### **1.4.8.1 Sediment**

Sediment sampling will be conducted in areas of the Hudson River where dredging has been performed to verify that post dredging conditions meet the project criteria. Core samples will be collected at pre-determined locations along a grid system. The core samples will be collected from a boat equipped for core sampling using vibracoring or manual coring techniques. At the end of each day, the cores will be transported to a shore-based processing facility where they will

# RA HEALTH AND SAFETY PLAN

be cut into segments, placed in containers, and submitted for laboratory analysis. If subsequent dredging is performed in a dredge area, another round of sediment sampling may be performed.

## 1.4.8.2 Fish

Fish monitoring will be performed in the Upper and Lower Hudson River at the following locations:

### Upper Hudson

- Feeder Dam
- Thompson Island Pool
- Northumberland/Fort Miller Pools
- Stillwater Pool

### Lower Hudson

- Albany/Troy
- Catskill
- Tappan Zee area

Fish collection will be performed annually at the Upper Hudson Stations and Albany/Troy. Monitoring at Catskill and the Tappan Zee area will be performed every other year. Fish may be collected for analysis using electro-shocking equipment, nets, or by angling. Fish sampling will be conducted from an appropriately equipped boat.

## 1.4.8.3 Water Column

Water sampling activities will be performed to monitor the in-river activities associated with dredging to assess achievement of the Engineering Performance Standards (EPS). The water column monitoring will include the following activities:

- Near-Field water column monitoring;
- Far-Field water column monitoring;
- Off-season water column monitoring; AND
- Monitoring of discharges to the Hudson River and Champlain Canal (Land Cut above Lock 7).

Near-Field water column monitoring will consist of deployment and operation of floating monitoring stations located in the river in the vicinity of dredging operations. These stations will be used to collect continuous water quality data which will be transmitted routinely to an environmental data management system (eDMS). The Near-Field monitoring stations will be

# RA HEALTH AND SAFETY PLAN

maintained on a daily basis. Maintenance activities will include cleaning and calibration of monitoring equipment, and manual collection of water samples. Personnel will service the stations by boat, and may be required to work after dark.

Far-Field water column monitoring will involve the maintenance and operation of fixed automated water sampling stations at five locations on the Upper Hudson River. These stations will pump water from the river on a continuous basis, enabling the collection of water samples using programmable water sampling equipment at predetermined times. Additionally, these stations will be used to collect continuous water quality data which will be transmitted routinely to the eDMS. The automated samplers will be housed in the pump house located on shore. Personnel will travel to the stations in a vehicle and perform maintenance activities on a daily basis. Additionally, samples will be collected manually at Bakers Falls, from the Mohawk River, and from the Lower Hudson River. At Bakers Falls and the Mohawk River, samples will be collected from a bridge; the Lower Hudson River stations will be sampled using a boat. Control measures for working on a bridge are described in Section 4.22. Samples will also be collected manually if an automated water sampling station becomes inoperative; these samples will be obtained either from near-by bridges or by boat, depending on safety conditions.

Off-season water column monitoring may be performed at all, or a portion of, the same locations utilized for Far-Field monitoring following the same general procedures. This monitoring will begin after dredging operations have been suspended for the year in the fall, and will continue until operations begin the following spring.

Monitoring of discharges to the Hudson River and Champlain Canal (Land Cut above Lock 7) will be performed using automatic sampling equipment located at the sediment processing facility. This sampling equipment will be maintained by personnel traveling by vehicle.

## 1.5 REMEDIAL DESIGN SUPPORT ACTIVITIES

A description of the tasks being undertaken in support of RD, with each such potential field activity is summarized in the following subsections. The descriptions of these potential field activities are general, since the specific field activities are described in more detail in various data collection work plans developed in support of design.

### 1.5.1 Engineering Data Collection

Ongoing support activities involving EDC include sediment sampling, debris and obstruction surveying, geotechnical characterization of sediments, sub-bottom physical characterization, disposal characterization and backfill source material identification and characterization.

# RA HEALTH AND SAFETY PLAN

## 1.5.1.1 Sediment Sampling

Sediment sampling will require use of a barge-mounted drill rig. Such equipment poses hazards in addition to those posed by working on or adjacent to the river. The control measures associated with barge-based drilling are described in Section 4.20.

## 1.5.1.2 Debris and Obstruction Survey

In-river surveys are being conducted to identify the types and locations of debris and obstructions on the river bottom. This information will be used to evaluate river bottom conditions, which will be important in the RA dredging activities.

This task includes collecting and analyzing debris information obtained from the side-scan sonar survey, sediment coring program, and sub-bottom physical investigation conducted as part of the Sediment Sampling and Analysis Plan (SSAP) activities. Debris and obstruction survey activities may employ a combination of geophysical techniques, including side-scan sonar, multi-beam sonar, sub-bottom profiling, use of a marine magnetometer, and/or use of a submerged video camera.

The field work associated with this activity shall include use of survey vessels. In addition, a vessel may be used to collect underwater video via remote video equipment or underwater video may be collected using divers with video equipment. Divers will use standard self-contained underwater breathing apparatus (scuba) and/or snorkel equipment. Appendix C contains a *Diving Safety Manual* for this project.

## 1.5.1.3 Geotechnical Characterization of Sediments

Geotechnical characterization of sediments is being conducted to supplement the geotechnical information obtained during the SSAP. These activities may include collecting additional sediment samples and submitting them for analysis of geotechnical parameters. The activities may also include other geotechnical tests.

The field work associated with this activity may include collecting sediment cores using vessels and equipment similar to those used for sediment coring activities, but also may include using other types of field equipment from the vessels to measure sediment properties in place.

## 1.5.1.4 Sub-Bottom Physical Characterization

Sub-bottom physical characterization is being conducted to learn more about the sub-bottom sediment (i.e., located below the sediment surface) in river areas designated for dredging. This characterization will provide geotechnical information on the makeup and integrity of the sub-grade conditions. This information will be used for developing the design for dredging, anchoring, spud setting, and the installation of other structures (e.g., sheet piling) deemed necessary for the remediation activities.

# RA HEALTH AND SAFETY PLAN

These sub-bottom physical characterization activities may include additional geophysical survey activities (e.g., sub-bottom profiling) and advancing soil borings into the river bottom to collect soil samples for laboratory analysis of geotechnical properties such as grain size, bulk density, and moisture content. The field work could consist of using the geophysical survey vessels and sediment coring procedure described above, as well as using barge-mounted drill rigs to collect deeper samples of underlying material.

## 1.5.1.5 Disposal Characterization

Disposal characterization activities will be conducted as necessary to obtain additional data necessary to further characterize the sediments for disposal. These activities may include collecting additional sediment samples for characterization of sediments under the Resource Conservation and Recovery Act (RCRA) and the Toxic Substances Control Act (TSCA). The work would be similar to other sediment coring activities in this RA HASP.

## 1.5.1.6 Backfill Source Material Identification and Characterization

Backfill source material identification and characterization activities are being conducted to support the development of the backfill specifications as part of the habitat replacement. It is anticipated that representative samples of the available materials from various potential borrow sources would be obtained to determine the physical and chemical characteristics. The field work would include collecting soil samples at potential borrow sources (some sources may be several miles from the river) and packaging and shipping the samples to laboratories for analytical testing.

## 1.5.2 Base-Mapping

This task involved developing a base map of the Upper Hudson River for the design activities. For the most part, the field work for this activity has already been completed. However, additional field work may be necessary to develop additional detailed mapping in certain areas (e.g., near shoreline areas, etc.) where surveyors may collect location-specific survey data (i.e., horizontal and vertical coordinates) to develop mapping information. These efforts would be performed by documenting features by boat or walking on shore.

## 1.5.3 Baseline Monitoring

Baseline monitoring activities are summarized in the *Baseline Monitoring Program Scoping Document* (QEA, 2003), and are described in detail in the Baseline Monitoring Quality Assurance Project Plan (QAPP). These activities are on-going and are being conducted to establish pre-dredging conditions for use in evaluating the achievement of performance standards during the RA and to provide data on PCB levels in fish and water to allow an evaluation of long-term recovery trends. These activities will include water column monitoring, fish monitoring, and special surface water studies.

# RA HEALTH AND SAFETY PLAN

Baseline monitoring field activities include:

- Collection of water column samples and water velocity measurements at monitoring stations at several locations along the Upper and Lower Hudson River – Monitoring stations will be accessed by personnel via boats and from bridges; and
- Fish survey activities at several locations along the Upper Hudson River and Albany/Troy in the Lower Hudson River – Sampling methods may include netting, electroshocking, and angling, conducted from the shore and from boats.

## 1.5.4 Habitat Delineation and Assessment

HDA activities are described in the HDA Work Plan (BBL, 2003) and are being conducted for each of the three primary habitat types present within the Upper Hudson River ecosystem:

1. River Bottom Habitats: Both unconsolidated river bottom and aquatic vegetation beds;
2. Shoreline Habitats: Maintained and natural shorelines; and
3. Wetland Habitats: Fringing wetlands (and other riverine hydrogeomorphic subclasses, if potentially impacted by dredging activities).

The data collection methods to be used for the HDA efforts described in the HDA Work Plan include:

- Using a boat for personnel transport to document field conditions;
- Conducting an underwater inspection using standard scuba and/or snorkel equipment;
- Collecting sediment samples using clear Lexan tubes to visually inspect sediments and obtain samples for laboratory analysis;
- Collecting submerged aquatic and wetland vegetation for laboratory analysis;
- Verifying field position using a differential global positioning system (DGPS);
- Visually identifying fringing wetlands and wetland sediment conditions;
- Visually identifying other riverine hydrogeomorphic subclasses of wetlands, if potentially impacted by dredging activities;
- Identifying and documenting the presence or signs of wildlife;
- Measuring light attenuation using hand-held instrumentation such as quantum sensors;
- Measuring river velocity using a hand-held velocity meter; and
- Documenting the shoreline using tape measure, inclinometer, video tape, and digital camera.

# RA HEALTH AND SAFETY PLAN

## 1.5.5 Cultural and Archaeological Resources Assessment

CARA activities are described in the CARA Work Plan (URS, 2003) and include an assessment of in-river cultural and archaeological resources that may be impacted by implementation of the USEPA remedy as well as shoreline areas that may become destabilized as a result of dredging.

CARA field activities being conducted include sediment coring, side-scan surveys, bathymetric surveys, magnetometer surveys, test pit installation, and scuba diving and/or snorkeling for data verification in dredge areas. The details of this work are specified in the *Archaeological Resources Assessment Reports*, as described in the CARA Work Plan.

## 1.5.6 Sediment Core Collection

Since 2002, over 8,000 sediment cores have been collected at predetermined locations in each river section, as described in the FSP. Additional sediment core collection may be performed in support of dredge area delineation activities. The procedures for collecting the sediment cores will follow the standard operating procedures (SOPs) to be included in the QAPP.

Most sediment cores have been collected with the use of vibratory coring equipment by advancing a sample collection tube into the sediment until significant resistance is encountered, at which time cores will be pulled from the sediments. Other sampling methods have been used, including push coring (in shallow water) and ponar dredges (areas with insufficient sediment for core collection). Each collected core is then capped, measured for length, logged and labeled, and stored upright in specialized storage coolers on the sampling vessel. At the end of each day the cores are transported to the processing laboratory for secure overnight storage.

## 1.5.7 Core Processing

The processing of the sediment cores into analytical samples is performed at the processing facility, which will be located in a laboratory at GE's Fort Edward Plant. The processing laboratory consists of laboratory, office, and storage space.

Sediment cores will be processed in the processing laboratory following the SOPs presented in the QAPP. The following procedures are used when processing cores:

- logging the core information into a database and generating corresponding sample labels;
- weighing, measuring, and marking segment locations on each sediment core;
- draining water from the core and collecting that water for disposal;
- segmenting each core into subsections using a vibratory saw or pipe cutter;

## **RA HEALTH AND SAFETY PLAN**

- extruding each subsection into a stainless steel bowl, homogenizing (i.e., thoroughly mixing) the sediment sample, and placing into labeled sampling containers;
- decontaminating processing equipment; and
- storing excess core material, decontamination fluids, and disposable personal protective equipment.

### **1.6 SCHEDULE FOR FIELD ACTIVITIES**

The schedule for field activities is discussed in the Phase 1 Remedial Action Work Plans submitted to EPA in conjunction with this RA HASP. Construction field activities will typically occur six days per week, between dawn and dusk. Dredging and processing operations will typically occur six days per week, 24 hours per day, with maintenance and/or schedule recovery being performed on the seventh day.

# RA HEALTH AND SAFETY PLAN

## SECTION 2

### SITE SAFETY PERSONNEL

#### 2.1 CONTACT INFORMATION FOR SITE SAFETY PERSONNEL

The project team shall implement a safety program that ensures the safety of all project employees, contractors, visitors, and others involved in the project. The site is defined as the processing/operations facility, rail yard, wharf, small craft marina and any river section where project related activities or equipment are involved (e.g., dredging, moving barge, etc). The names and contact information for lead site safety personnel are presented in Attachment A. As lead site safety personnel and phone numbers are added or changed during the course of RA activities, modifications to this list will be provided to the USEPA for posting at the USEPA's Hudson River Field Office and on the USEPA's website. This information will be available in all areas where RA activities are taking place.

#### 2.2 LEAD SITE SAFETY PERSONNEL

The following two organization charts outline the overall project safety organization and chain of command for the site safety personnel.

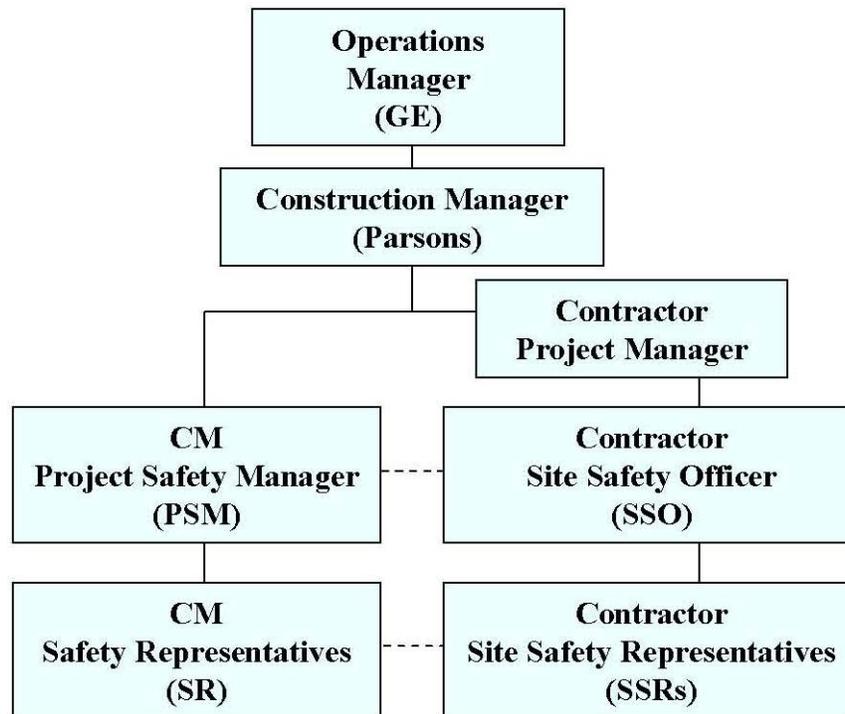
The roles of the lead site safety personnel — the CM Safety Manager and CM safety representatives — as they relate to the health and safety issues, are outlined below. The CM project safety manager (PSM) will be supported by the different CM safety representatives, including SSRs, for each type of field activity.

The CM's role in implementing a safety program includes the following responsibilities:

- Provide leadership by demonstrating a personal commitment to safety at all times;
- Provide hands-on participation in the development and implementation of the RA HASP;
- Develop incentive/rewards programs to recognize safety achievements;
- Establish a disciplinary program for unsafe behavior; and
- Meet safety targets.

# RA HEALTH AND SAFETY PLAN

## RA HASP PROJECT SAFETY ORGANIZATION



### 2.2.1 Safety Manager (for CM)

The CM PSM or designee will be available on site whenever field activities are occurring. The PSM will confirm that all site personnel are familiar with the provisions of this RA HASP and the CHASP (Parsons, 2007) and that workers understand the hazards that they may encounter and the procedures for mitigating those hazards (e.g., safe work practices, personal protective equipment [PPE]). The PSM will also serve as the emergency response liaison and incident commander, in addition to being the primary contact with GE and regulatory agencies for health and safety issues. The roles and responsibilities of the PSM shall include but may not be limited to the following:

- Be the most visible leader for the project's zero incident safety culture and lead the jobsite in the belief that all incidents are preventable and a zero incidents goal is attainable;
- Will act as the incident commander for project emergencies that are handled internally. In the event of an emergency requiring external emergency response, the first responding agency's lead officer will become the incident commander when he arrives on site. The PSM will serve as liaison to the external incident commander, as appropriate;

## RA HEALTH AND SAFETY PLAN

- Ensure preparedness for emergency responses to incidents and that project personnel are adequately trained in the emergency response plan procedures;
- Inform appropriate authorities and response agencies in the event of a spill that potentially poses a hazard to the public;
- Release a Stop-Work order after the conditions that initiated the order are corrected. The CM construction manager will issue an authorization to proceed after receipt of the release from the PSM and any other required conditions have been met;
- Maintain, update, and implement the RA HASP;
- Approve any changes to the RA HASP due to modifications of procedures or newly proposed site activities;
- Ensure that personnel assigned to the project have appropriate training certifications and medical clearance;
- Ensure controlled substance and alcohol testing is completed for all workers prior to starting work;
- Assess site security and control procedures that address the health and safety of the public and non-authorized personnel who may visit the work sites;
- Work with GE's health and safety personnel to inform personnel of any site-specific practices and procedures that must be followed in addition to the provisions of this RA HASP;
- Display leadership in all HASP activities and confirm regulatory compliance by subordinates/team members;
- Coordinate the SSRs on matters relating to work site activities, ongoing and/or planned, to verify that adequate consideration is given to maximum employee health and safety protection and compliance with applicable local, state, and federal regulations;
- Consult with SSRs and project team members on matters relating to suspending site activities in the event of an emergency; and
- Verify that corrective actions resulting from deficiencies identified by audit and observation are implemented and effective. Reviews are conducted regularly; deficiencies, if any, are identified; issues are tracked to closure; improvements are made to prevent potential hazards; and mitigation measures are implemented as a result of these reviews.

Audits will include the inspection and assessment provisions set forth above, as well as a brief summary report noting any deviations from this RA HASP and corrective actions that may be necessary to promote the health and safety of workers and the public.

# RA HEALTH AND SAFETY PLAN

While field activities are underway, the PSM will be either on site or available via cell phone should an emergency arise. While off site, the PSM will designate an alternate — typically one of the CM SSRs — to be the primary point of contact for daily health and safety issues. This person will be identified during the daily health and safety briefings.

The PSM will work with the CM to address any community health and safety issues. The PSM will be a board-certified safety professional (CSP) or certified industrial hygienist (CIH), as well as have completed Occupational Safety and Health Administration (OSHA) 40-hour hazardous waste operations (HAZWOPER) training (29 CFR 1910.120), additional 8-Hour HAZWOPER Supervisor Training and current eight-hour annual refresher. In addition, the PSM will have current training in first aid and cardiopulmonary resuscitation (CPR).

## 2.2.2 Safety Representatives (for CM)

CM safety representatives will be responsible for managing on-site health and safety activities and will provide support to the PSM on health and safety issues that relate to their tasks. Additional responsibilities for the CM safety representative include but shall not be limited to the following:

- Be a visible leader for the project's zero incident safety culture and carry out their tasks with the belief that all incidents are preventable and a zero incidents goal is attainable;
- Implement the RA HASP;
- Suspend field work in an emergency or if unsafe work conditions exist;
- Review safety protocols and procedures (Job Safety analysis [JSA]) as necessary for field work;
- Observe workers for signs and symptoms of chemical exposure, heat/cold stress, fatigue, etc.;
- Initiate emergency response plan procedures as necessary;
- Provide site-specific project orientation to field workers and verify that all personnel know who to contact and what to do in the event of an emergency at each work site;
- Perform and document periodic audits of compliance with health and safety procedures and work with contractors to address any deficiencies and develop solutions that are compliant and correctly address the safety concern;
- Follow-up and conduct investigations on all incidents and near-miss incidents, share conclusions and findings with workers during daily tool-box meetings, or initiate safety work stand-downs to communicate important findings;
- Ensure PPE is available for workers and ensure that workers are aware of the availability;

## RA HEALTH AND SAFETY PLAN

- Audit the health and safety practices and procedures within the work zones/areas on a continuous basis and work with contractor to adapt practices and procedures to changing circumstances (encourage the safety system to be a living and organic system that adapts to changes);
- Be a resource for leading the daily health and safety briefings and encourage personnel to raise safety concerns. Work with individuals to address any specific health and safety issues that may be raised at the meetings and ensure that they are aware that they can refuse to do unsafe tasks or activities and that they can do so without fear of reprisal or dismissal (otherwise known as their “stop work authority”);
- Inspect the site work zones/areas (i.e., construction, processing/operations, dredging) to verify that adequate hazard communication measures are in place; and
- Inspect the site work zones/areas to verify that proper procedures are in place and are being followed for decontamination and that the support zone (SZ), contaminant reduction zone (CRZ), and exclusion zone (EZ) are clearly delineated.

CM safety representatives involved with the processing facility or dredging operations will have completed the required OSHA 40-hour HAZWOPER training (29 CFR 1910.120) and current eight-hour annual refresher. CM safety representatives involved with the construction of the processing facility or rail yard will have a 30-hour OSHA construction safety certification, or certification as a CSP or construction health and safety technician (CHST). CM safety representatives involved with the processing or dredging operations will have a 30-hour OSHA construction safety certification, or certification as a CSP, CIH, or occupational health and safety technician (OHST). In addition, all CM safety representatives will have current training in first aid and CPR.

Additional responsibilities of the CM PSM, safety representatives, and site supervisors related to emergency response are described in Section 10.

### **2.2.3 Site Safety Officer / Site Safety and Health Officer (for Contractor)**

Contractor SSO or SSHO will be responsible for all on-site health and safety activities that relate to their scope of work, and will have the authority to suspend such activities in the event of an emergency or unsafe working conditions. The SSO or SSHO will be the primary point of contact for all field personnel and visitors observing field activities, and has direct responsibility for the implementation and administration of the contractor’s RA HASP. Specifically, the SSO or SSHO will be responsible for the following:

- Be a local leader for the project’s zero incident safety culture and lead their workers in the belief that all incidents are preventable and a zero incidents goal is attainable;
- Enforce all health and safety rules and regulations within the scope of this RA HASP;

## RA HEALTH AND SAFETY PLAN

- Lead the daily health and safety briefings and encourage personnel to raise safety concerns and then work with them to address any specific health and safety issues that may be raised at those meetings;
- Ensure that the workers are aware that they can refuse to do unsafe tasks or activities; and that they can do so without fear of reprisal or dismissal (otherwise known as their “stop work authority”);
- Conduct and document health and safety audits;
- Coordinating with the PSM and the CM safety representative on matters pertaining to project health and safety;
- Evaluate field activities to detect unsafe acts and conditions and develop solutions that address the root cause of the unsafe act or condition;
- Educate employees regarding the zero incident safety culture, applicable work practices, procedures, rules, and regulations;
- Be a mentor, facilitator, and encourager of workers in being responsible for their own and their colleague’s safety;
- Educate employees on applicable emergency contingency plans;
- Report all incidents and injuries to the project manager, PSM, and appropriate safety representative; and
- Share with project manager, PSM, and appropriate safety representative safety accomplishments, solutions, and achievements, so that they can be passed onto other parts of the project.

Contractor SSO or SSHO will also be available to assist in addressing community health and safety issues.

The SSO involved with construction activities shall have a minimum of 10 years of safety experience of a progressive nature with at least 5 years of experience on similar projects, will have completed the required OSHA 40-hour HAZWOPER training (29 CFR 1926.65), additional eight-hour HAZWOPER supervisor training, and current eight-hour annual refresher (for activities involved with PCB-impacted sediments) and shall possess one of the following certifications:

- CSP
- CHST

The SSHO involved with processing and dredging activities shall have a minimum of 10 years of safety experience of a progressive nature with at least 5 years of experience on similar projects, will have completed the required OSHA 40-hour HAZWOPER training

# RA HEALTH AND SAFETY PLAN

(29 CFR 1910.120), additional eight-hour HAZWOPER supervisor training, and current eight-hour annual refresher and shall possess one of the following certifications:

- CSP
- CIH
- OHST

## 2.2.4 Site Safety Representative (for Contractor)

A SSR involved with construction activities shall have a minimum of five years of safety experience of a progressive nature with at least two years of experience on similar projects, and have completed a 30-hour OSHA Construction Safety course or equivalent. Each SSR involved with construction activities shall have formal documented safety training for competent person status for the following 7 areas of competency, based on the Contractor scope of work and the SSRs assigned responsibility:

- Excavation (29 CFR 1926 Subpart P);
- Scaffolding (29 CFR 1926 Subpart L);
- Fall protection (29 CFR 1926 Subpart M);
- Manlifts (29 CFR 1910 Subpart F);
- Material Handling (29 CFR 1910 Subpart N);
- Hazardous energy (29 CFR 1910.147);
- Confined space (29 CFR 1910.146); and
- Hazardous Waste Operations and Emergency Response (29 CFR 1926.65).

All SSRs involved with processing and dredging activities shall have a minimum of 5 years of safety experience of a progressive nature with at least 2 years of experience on similar projects, will have completed the required OSHA 40-hour HAZWOPER training (29 CFR 1910.120), and current eight-hour annual refresher and have completed a 30-hour OSHA Construction Safety course or equivalent. Each SSR will also have formal documented safety training for competent person status for at least the following three areas of competency:

- Hazardous Waste Operations and Emergency Response (29 CFR 1910.120);
- Personal Protective Equipment (29 CFR 1910 Subpart I);
- Machinery and Machine Guarding (29 CFR 1910 Subpart O);
- Commercial Diving Operations (29 CFR 1910 Subpart T), and
- Materials Handling and Storage (29 CFR 1910 Subpart N).

# RA HEALTH AND SAFETY PLAN

The SSR involved with habitat construction will have formal documented safety training for competent person status for at least the following areas:

- Commercial Diving Operations (29 CFR 1910 Subpart T); and
- Hazardous Waste Operations (29 CFR 1910.120).

Contractors shall provide at least two individuals current in CPR/First Aid training for each work area during every shift, including each individual barge/dredge. Where an automated external defibrillator (AED) is required, at least two individuals must be trained in its use.

## 2.2.5 Project Workers

Every project worker on the jobsite (from GE management to Contractor workers) is responsible for safety. These responsibilities include:

- To commit to the project zero incident culture and to believe that all incidents are preventable and zero incidents are attainable;
- To exercise your “Stop Work Authority” by intervening if you see co-workers about to commit an unsafe act and to call a halt to any unsafe activity you witness;
- To participate in daily tool box meetings and to share opinions or ideas on better safe work practices;
- To adhere to the buddy system at all times;
- To follow all procedures identified in the RA HASP, Contractor HASP or may be communicated to you by supervisory staff;
- To be receptive to training in safer work practices; and
- To be tolerant towards your co-workers and open to their views and suggestions pertaining to safer work practices even if they are different from what you are used to doing.

## 2.2.6 Processing/Operations Facility, Dredging and Habitat Construction Personnel

All contractor and subcontract personnel involved with the processing/operations facility, dredging operations or habitat construction that have the potential to be exposed to hazardous substances or health hazards will be required to provide proof of OSHA 40-hour HAZWOPER training (29 CFR 1910.120) and current refresher, and a written statement of medical clearance to wear a respirator. All personnel will be made aware of the provisions of this RA HASP and will be required to sign the HASP acknowledgment (Attachment B). This documentation will be maintained by the PSM.

All contractor processing/operations facility, dredging, and habitat construction personnel working on the project who have the potential to be exposed to hazardous substances or health

## **RA HEALTH AND SAFETY PLAN**

hazards will be required to have a medical evaluation certifying their physical fitness for hazardous waste site operations [29 CFR 1910.120(f)]. At a minimum, this evaluation will comply with OSHA's Respiratory Protection Standard, 29 CFR 1910.134.

All project personnel will be required to attend the daily health and safety and project coordination meeting to be eligible to work on the site that shift. At this meeting, personnel will sign in with the site supervisor (or designee), who will verify the status of employee credentials and distribute the daily sign-in sheets to appropriate project personnel.

Contractors are responsible for the ultimate health and safety of their employees that will participate in RA work activities. This RA HASP represents the minimum acceptable health and safety standards to be followed on the project. Contractors shall develop a contractor HASP that mandates additional health and safety protection measures for their employees, which will be included as addenda to this RA HASP. Contractor employees associated with dredging, processing/operations and/or handling PCB-impacted sediments shall have medical examinations in compliance with 29 CFR 1910.120(f), and as required based upon the substances that the employees will or could be exposed to. Contractor employees required to wear a respirator shall be trained, medically qualified and fit tested on an annual basis as per 29 CFR 1910.134.

# RA HEALTH AND SAFETY PLAN

## SECTION 3

### SITE LAYOUT AND CONTROL PLAN

#### 3.1 GENERAL

The Upper Hudson River (from Hudson Falls to Troy, New York) has been divided into River Sections 1, 2, and 3, as shown on Figure 1. The area includes numerous towns and villages and several major roadways. The various areas to be dredged are shown on Figure 2.

Figure 3 is a layout of the processing facility (e.g., construction areas, processing areas, the barge unloading area, and the rail yard), which will be fenced and gated on all non-water sides. Figure 4 is a site layout of the work support marina, which will also be fenced and gated on all non-water sides. Approximately 16,000 feet of perimeter and exclusion zone chain link fencing will be installed around the perimeter and interior portions of the processing facility to restrict unauthorized access.

Entry points will either be locked or staffed by security personnel to restrict access and minimize potential public trespass. Routine access to the facility processing area will be by the Main Access Road. During an emergency the Main Access Road will be supplemented by the East Access Road. Access to the support marina will be a single access road off of West River Road. Anyone wishing to enter either site will be required to inform the security guard the purpose of their visit and the name of a project contact person (if applicable). Workers will be provided with personal ID badges to access either the facility site, support marina or both. The security guard will also have a list of project personnel with phone numbers or radio contact information. If an individual attempting to enter the site does not have a personal ID badge, then the security guard will notify the appropriate project personnel for site access approval. Workers and visitors authorized to access the site must show proper identification and sign in and out. Visitors authorized to access the site shall be escorted by project personnel at all times.

Personnel authorized to access any marine vessel (e.g., barge, dredge, tug boat, etc) will be determined by the CM, vessel captain or contractor safety representative for the vessel. Safety personnel for the CM will be permitted on any marine vessel at any time.

#### 3.2 RIVER WORK

Field work that requires using vessels in the river will be coordinated with the New York State Canal Corporation (NYSCC), which operates the Champlain Canal System, the United States Coast Guard (USCG), who has jurisdiction of the waterway, and will be overseen by the USEPA or its designee. All vessels associated with the field activities will monitor marine band channel 13 as well as the project marine band channel. While performing field work within the

## **RA HEALTH AND SAFETY PLAN**

designated navigational channel proper, the boats will station buoys to clearly denote the area in which other boats may freely navigate. Vessels associated with the field activities will adhere to standard NYSCC and USCG navigation laws. Vessel movement will stop when visibility is below 500 feet, except barges, for which movement will stop when visibility is below 2000 feet.

For field efforts that require using divers for river bottom observations, appropriate protocols (i.e., dive flags) will be used to alert boaters where diving operations are underway.

Dive plans have to be submitted to the CM and approved before any diving activity can take place.

Contractor has to develop a lock transit safety plan in conjunction with NYSCC. That addresses collisions and spills inside the lock area.

Contractor shall submit vessel safety inspections prior to being used on the project and monthly thereafter.

# RA HEALTH AND SAFETY PLAN

## SECTION 4

### POTENTIAL HEALTH AND SAFETY HAZARDS AND CONTROLS

#### 4.1 FIELD HAZARDS AND CONTROL MEASURES

The following sections discuss general safety and health hazards associated with the specific field activities of the RA Work Plans and support activities. The descriptions of these field activities are general, since the specific field activities will be described in more detail in the contractor HASP submitted by each contractor performing the work. Each contractor HASP will specify minimum procedures for controlling the hazards associated with the various field activities.

Minimum control measures and procedures to be used on the project are detailed in Section 4.2 – General Hazard and Control Measures. In this section, the overall guidelines on when and how to develop a JSA for specific tasks are discussed. Sections 4.3 through 4.23 specifically address procedures and control measures for water safety, lockout/tagout, (LOTO) fire prevention/hot work permits, confined space entry, fall protection, cranes, hoisting and rigging, scaffolding, electrical safety, hand/power tools, ladder safety, housekeeping, steel erection, diving safety, soft/hard line handling, heat stress, cold stress, biological hazards, safe lifting, PCBs, drilling operations, working on ice, electrofishing and working on a bridge.

All work must be performed using the buddy system, a system of organizing employees into work groups so that each employee of the work group is designated to be observed by at least one other employee in the work group. The purpose of the buddy system is to provide rapid assistance to employees in the event of an emergency. If an individual in a work group does not have a direct line of sight with another group member, then the individual must have a means of communicating with the group (i.e., two-way radio).

##### 4.1.1 Contract 1 – Phase 1 Facility Site Work Construction

Infrastructure, including electricity, water, sewers, utilities, and roads, will be developed within the property. Backfill will be used to grade the property for construction, and security fencing will be placed around the entire perimeter of the property.

A waterfront unloading facility will be constructed on property owned by the NYSCC. The waterfront area will encompass approximately 1,450 feet of shoreline and will be able to accommodate multiple barges at a time.

Approximately 35,000 cubic yards of material will be excavated along the canal to construct the unloading facility.

# RA HEALTH AND SAFETY PLAN

## Hazards

The hazards associated with these activities can be physical, biological, and environmental.

Physical hazards include but are not limited to:

- Being caught in/between/under equipment or materials;
- Being struck by tools/equipment/materials;
- Coming in contact with electricity;
- Coming into contact with contaminated sediment (for in-river work below Lock 7) or hazardous materials;
- Drowning;
- Fall from elevation;
- Fatigue;
- Fires;
- Lifting or carrying heavy materials;
- Pulling or pushing objects and materials;
- Slips/trips/falls on same elevation surfaces;
- Vehicle/train incidents; and
- Working in trenches/excavations.

Biological hazards include exposure to dead animals, organic wastes, and contaminated soil and water that can harbor parasites and pathogens. Environmental hazards include exposure to poisonous vegetation, insects, animals, rodents, heat, cold, ultra-violet radiation, noise, and lightning.

Manual materials handling and manual project site preparation may cause blisters, sore muscles, and joint and skeletal injuries; these activities may also present eye, overhead, contusion, and laceration hazards. The work area may present slip, trip, and fall hazards from scattered debris and irregular walking surfaces. Rainy weather may cause wet, muddy, slick walking surfaces and unstable soil. Freezing weather hazards include frozen, slick, and irregular walking surfaces.

## Control Measures

In accordance with Section 5 in the contractor HASP, a hazard/risk/exposure assessment will be provided for each major activity that will take place. Section 6 of the contractor HASP provides the JSA for each major activity, which identifies the steps, hazards and control

# RA HEALTH AND SAFETY PLAN

measures for each task. Also included will be applicable procedures to mitigate known risks or hazards, such as emergency equipment or supplies required to be available on site based on the field activities taking place and potential releases to the environment.

## 4.1.2 Contract 2 – Phase 1 Rail Yard Construction

The Phase 1 rail yard construction shall consist of activities required to construct rail yard track and facilities on both GE and Canadian Pacific Railway properties. This will involve the construction of ballasted track, engine house, repair track facility, and weigh-in-motion scale.

### **Hazards**

The hazards associated with these activities are mainly physical and environmental.

Physical hazards include but are not limited to:

- Being caught in/between/under equipment or materials;
- Being struck by tools/equipment/materials;
- Coming in contact with electricity;
- Coming into contact with hazardous materials;
- Fall from elevation;
- Fatigue;
- Fires;
- Lifting or carrying heavy materials;
- Pulling or pushing objects and materials;
- Slips/trips/falls on same elevation surfaces;
- Vehicle/train incidents; and
- Working in trenches/excavations.

Environmental hazards include exposure to insects, animals, rodents, heat, cold, ultra-violet radiation, noise, and lightning.

### **Control Measures**

In accordance with Section 5 in the contractor HASP, a hazard/risk/exposure assessment will be provided for each major activity that will take place. Section 6 of the contractor HASP provides the JSA for each major activity, which identifies the steps, hazards, and control measures for each task. Also included will be applicable procedures to mitigate known risks or

# RA HEALTH AND SAFETY PLAN

hazards, such as emergency equipment or supplies required to be available on site based on the field activities taking place and potential releases to the environment.

## 4.1.3 Contract 3A – Phase 1 Processing Facility Construction

Phase 1 processing facility construction will encompass electrical, mechanical, and limited civil work to install and commission unit-process equipment to be used for sediment dewatering. This effort will also cover the remaining site work, such as processing facility buildings, as well as piping, electrical, instrumentation, controls, and communications.

### **Hazards**

The hazards associated with these activities are mainly physical and environmental.

Physical hazards include but are not limited to:

- Being caught in/between/under equipment or materials;
- Being struck by tools/equipment/materials;
- Coming in contact with electricity;
- Coming into contact with hazardous materials;
- Fall from elevation;
- Fatigue;
- Fires;
- Lifting or carrying heavy materials;
- Pulling or pushing objects and materials;
- Slips/trips/falls on same elevation surfaces;
- Vehicle incidents; and
- Working in trenches/excavations.

Environmental hazards include exposure to insects, animals, rodents, heat, cold, ultra-violet radiation, noise, and lightning.

### **Control Measures**

In accordance with Section 5 in the contractor HASP, a hazard/risk/exposure assessment will be provided for each major activity that will take place. Section 6 of the contractor HASP provides the JSA for each major activity, which identifies the steps, hazards, and control measures for each task. Also included will be applicable procedures to mitigate known risks or

# RA HEALTH AND SAFETY PLAN

hazards, such as emergency equipment or supplies required to be available on site based on the field activities taking place and potential releases to the environment.

## 4.1.4 Contract 3B – Phase 1 Processing Facility Operations

Phase 1 operations of the processing facility will occur 24 hours a day, six days a week, with the seventh day reserved for maintenance, make-up time for unplanned outages, or as a contingency to satisfy the productivity requirement.

Dredged material will be unloaded from barges by a mechanical off-loader. Large debris will be separated and the remaining sediment will be sent to two hydrocyclone systems, which separate sediment into coarse material (e.g., sand and gravel) and fine (or silty) material.

Coarse material from the hydrocyclone systems will be placed on a screen to remove excess water. Fine material will be mixed with polymers to enhance dewatering and then sent through filter presses for water removal.

Trucks will move processed coarse materials from the dewatering area to enclosed structures on the property.

Water generated during sediment processing, along with rain that falls on material handling areas, will be collected for on-site treatment. Once treated, the clean water will be discharged into the Champlain Canal.

The processing facility operator will use a tug to aid in the efficient movement of barges between the unloading wharf and the mooring dolphins.

### **Hazards**

The hazards associated with these activities are mainly physical and environmental.

Physical hazards include but are not limited to:

- Being caught in/between/under equipment or materials;
- Being struck by tools/equipment/materials;
- Coming in contact with electricity;
- Coming into contact with hazardous materials;
- Drowning;
- Fall from elevation;
- Fatigue;
- Fires;

# RA HEALTH AND SAFETY PLAN

- Lifting or carrying heavy materials;
- Pulling or pushing objects and materials;
- Slips/trips/falls on same elevation surfaces;
- Vehicle/train incidents; and
- Working in trenches/excavations.

Environmental hazards include exposure to insects, animals, rodents, heat, cold, ultra-violet radiation, noise, and lightning.

## **Control Measures**

In accordance with Section 5 in the contractor HASP, a hazard/risk/exposure assessment will be provided for each major activity that will take place. Section 6 of the contractor HASP provides the JSA for each major activity, which identifies the steps, hazards, and control measures for each task. Also included will be applicable procedures to mitigate known risks or hazards, such as emergency equipment or supplies required to be available on site based on the field activities taking place and potential releases to the environment.

### **4.1.5 Contract 4 – Phase 1 Dredging Operations**

Dredging of sediment will occur 24 hours a day, six days a week, with the seventh day reserved for maintenance and make-up time for unplanned project interruptions.

Environmental bucket dredges will be used. This type of mechanical dredging uses a sealed bucket to capture the contaminated sediment. Tugboats and barges will transport the sediment to the dewatering facility.

A marine support facility will provide docks for support vessels (e.g., survey, sampling, and oversight boats) to reduce the number of project-related vessels that need to travel through Lock 7.

After dredging, clean sand, gravel, or stone may be used as backfill to cover some dredged areas. The clean backfill materials will be transported directly from the staging areas of one or more quarries on the river to dredged areas via barge.

To minimize and control sediment resuspension during Phase 1, sheet piling and silt curtains will be installed in the river at some locations.

## **Hazards**

The hazards associated with these activities are mainly physical and environmental.

# RA HEALTH AND SAFETY PLAN

Physical hazards include but are not limited to:

- Being caught in/between/under equipment or materials;
- Being struck by tools/equipment/materials;
- Coming into contact with contaminated sediment or hazardous materials;
- Confined space hazards;
- Drowning;
- Fall from elevation;
- Fatigue;
- Fires;
- Lifting or carrying heavy materials;
- Marine vessel incidents;
- Pulling or pushing objects and materials;
- Slips/trips/falls on same elevation surfaces;
- Soft/hard line hazards; and
- Proximity to dams and similar structures.

Environmental hazards include exposure to insects, animals, rodents, heat, cold, ultra-violet radiation, high wind, river current, noise, and lightning.

## **Control Measures**

In accordance with Section 5 in the Contractor HASP, a hazard/risk/exposure assessment will be provided for each major activity that will take place. Section 6 of the contractor HASP provides the JSA for each major activity, which identifies the steps, hazards, and control measures for each task. Also included will be applicable procedures to mitigate known risks or hazards, such as emergency equipment or supplies required to be available on site based on the field activities taking place and potential releases to the environment.

Exclusion zones must be established around areas on-board the dredge, barges, and other support vessels where workers could incur contact with contaminated sediments. Such contact could result when the contaminated dredge bucket is placed on the deck of the dredge for storage, cleaning, or maintenance. Also dredge material spillage on the deck and gunwales of the material barges could be a source of exposure for the crew members. The dredging contractor will describe the exact locations of these exclusion zones and associated decontamination areas and support zones in their Contractor Health and Safety Plan.

# RA HEALTH AND SAFETY PLAN

## 4.1.6 Contract 5 – Phase 1 Habitat Construction

The Phase 1 habitat construction shall consist of all activities related to the replacement of specified plantings in designated project areas. Divers will carry out the habitat construction, following procedures intended to maximize protection of divers from accidental injury and/or illness. The requirements for diver experience and training are also included.

### **Hazards**

The hazards associated with these activities are mainly physical and environmental.

Physical hazards include but are not limited to:

- Being struck by tools/equipment/materials;
- Coming into contact with contaminated sediment or hazardous materials;
- Drowning;
- Fatigue;
- Fires;
- Lifting or carrying heavy materials;
- Marine vessel incidents; and
- Slips/trips/falls on same elevation surfaces.

Environmental hazards include exposure to insects, animals, rodents, heat, cold, ultra-violet radiation, high winds, river current, and lightning.

### **Control Measures**

In accordance with Section 5 in the contractor HASP, a hazard/risk/exposure assessment will be provided for each major activity that will take place. Section 6 of the contractor HASP provides the JSA for each major activity, which identifies the steps, hazards, and control measures for each task. Also included will be applicable procedures to mitigate known risks or hazards, such as emergency equipment or supplies required to be available on site, based on the field activities taking place, hazards anticipated and potential releases to the environment.

Contractors engaged in commercial diving must develop a *Safe Practices Manual* for Commercial Diving. All diving operations must be conducted in accordance with 29 CFR 1910 Subpart T.

The diving contractor will also provide a task specific “Dive Plan” for each individual diving assignment that outlines the personnel roles and responsibilities, equipment, standard operating procedures, hazard controls, emergency procedures, etc. in accordance with 29 CFR

# RA HEALTH AND SAFETY PLAN

1910 Subpart T. Each Site Specific Dive Plan must be approved by the CM before the diving operation can begin.

## 4.1.7 Contract 6 – Phase 1 Rail Yard Operations

At the staging area of the facility, dewatered sediment will be loaded into rail cars. The dewatered sediment will then be transported via rail to final destination(s).

Approximately 38,000 feet (just over seven miles) of railroad track will be installed to enable loading, maneuvering, repair, and inspection of rail cars. Rail will also be used for delivery of materials to the processing facility whenever possible.

During Phase 1, processed material will be transported off site. To move the material, trains will leave from the site each week.

### **Hazards**

The hazards associated with these activities are mainly physical and environmental.

Physical hazards include but are not limited to:

- Being caught in/between/under equipment or materials;
- Being struck by tools/equipment/materials;
- Coming into contact with contaminated sediment or hazardous materials;
- Fall from elevation;
- Fatigue;
- Fires;
- Pulling or pushing objects and materials;
- Slips/trips/falls on same elevation surfaces; and
- Vehicle/train incidents.

Environmental hazards include exposure to insects, animals, rodents, heat, cold, ultra-violet radiation, noise, and lightning.

### **Control Measures**

In accordance with Section 5 in the contractor HASP, a hazard/risk/exposure assessment will be provided for each major activity that will take place. Section 6 of the contractor HASP provides the JSA for each major activity, which identifies the steps, hazards, and control measures for each task. Also included will be applicable procedures to mitigate known risks or

# RA HEALTH AND SAFETY PLAN

hazards, such as emergency equipment or supplies required to be available on site based on the field activities taking place and potential releases to the environment.

## 4.1.8 Support Activities

Field work associated with support activities include the use of marine vessels for surveying and collecting samples (i.e., sediment, fish, water column); divers for underwater inspection and video, barge mounted drill rigs for core samples, cutting packaging, handling and/or transporting samples, equipment and supplies, electrofishing and working on bridges.

### Hazards

The hazards associated with these activities can be physical, biological, and environmental.

Physical hazards include but are not limited to:

- Being caught in/between/under equipment or materials;
- Being struck by tools/equipment/materials;
- Coming into contact with contaminated sediment (for in-river work below Lock 7) or hazardous materials;
- Drowning;
- Electrical shock;
- Fall from elevation;
- Fatigue;
- Fires;
- Lifting or carrying heavy materials;
- Pulling or pushing objects and materials;
- Slips/trips/falls on same elevation surfaces;
- Vehicle/train incidents; and
- Marine vessel incidents.

Biological hazards include exposure to dead animals, organic wastes, and contaminated soil and water that can harbor parasites and pathogens. Environmental hazards include exposure to poisonous vegetation, insects, animals, rodents, heat, cold, ultra-violet radiation, noise, and lightning.

Manual materials handling and manual project site preparation may cause blisters, sore muscles, and joint and skeletal injuries; these activities may also present eye, overhead, contusion, and laceration hazards. The work area may present slip, trip, and fall hazards from

# RA HEALTH AND SAFETY PLAN

scattered debris and irregular walking surfaces. Work in close proximity to the river presents the possibility of drowning. Rainy weather may cause wet, muddy, slick walking surfaces, and unstable soil. Freezing weather hazards include frozen, slick, and irregular walking surfaces.

## Control Measures

In accordance with Section 5 in the contractor HASP, a hazard/risk/exposure assessment will be provided for each major activity that will take place. Section 6 of the contractor HASP provides the JSA for each major activity, which identifies the steps, hazards, and control measures for each task. Also included will be applicable procedures to mitigate known risks or hazards, such as emergency equipment or supplies required to be available on site based on the field activities taking place and potential releases to the environment. Section 4.3 presents safe work practices for working on and adjacent to the river. Control measures for boating safety are presented in Sections 4.3 and 8.6, and those for diving safety are presented in Section 4.15 and Appendix C.

## 4.2 GENERAL HAZARDS AND CONTROL MEASURES

General safety and health hazards are associated with the field activities of the RA work plan and support activities. As per Sections 5 and 6 of the contractor RA HASP, contractors are required to conduct a JSA for all aspects of their work. The JSA consists of the following three steps:

- Identify the task and break it down into steps.
- Identify the hazards associated with each step.
- Identify the specific hazard control measure used for each step in accordance with the order-of-precedence method of control.

Below are some sample questions to aid the contractor in completing JSAs. This list is not comprehensive because each portion of the project (i.e., construction, processing/operations, dredging) has its own requirements and environmental conditions. The person developing the JSA should also consider taking photographs of the work area for a more detailed analysis of the work environment.

- Are materials on the ground/floor that could trip a worker?
- Is lighting adequate?
- Are there any live electrical hazards at the jobsite?
- Do any tools, including hand tools, machines, and equipment need repair?
- Is there excessive noise in the work area that could hinder worker communication and increase the risk of hearing loss?

## RA HEALTH AND SAFETY PLAN

- Is fire protection equipment readily accessible and have employees been trained to use it?
- Are emergency exits clearly marked?
- Are operators required to have a certificate or a license?
- Are trucks or motorized vehicles equipped with brakes, overhead guards, backup signals, horns, steering gear, and identification, as necessary?
- Are employees who operate vehicles and equipment trained and authorized?
- Are employees wearing the PPE required for the jobs they perform?
- Have any employees complained of headaches, breathing problems, dizziness, or strong odors?
- Is ventilation adequate?
- Does the job involve entry into a confined space?
- Are permits required for hot work, confined space work, or similar work?
- Are workers wearing clothing or jewelry that could get caught in machinery?
- Are workers provided and trained in the use of personal protective equipment appropriate to activities, e.g., hard hats, sturdy footwear, eye protection, hearing protection, etc.?
- Are there fixed objects such as sharp machine edges that could cause injury?
- Can workers get caught in or between machinery?
- Can reaching over moving machinery or materials injure workers?
- Is a worker in an off-balance position at any time?
- Is a worker's position in relation to a machine or equipment potentially dangerous?
- Is a worker required to make movements that could cause hand or foot injury, repetitive motion injuries, or strain from lifting?
- Can an object come loose and strike the worker?
- Do suspended loads or potential energy — compressed springs, hydraulics or jacks — pose hazards to workers?
- Are there guardrails in place to prevent a fall from one level to another?
- Can a worker be injured by lifting or carrying heavy objects?
- Do environmental hazards — dust, chemicals, radiation, welding rays, heat or excessive noise — result from performing a job or activity?

## RA HEALTH AND SAFETY PLAN

- Are work positions, machinery, pits or holes, and hazardous operations adequately guarded?
- Are lockout procedures for machinery deactivation used during maintenance procedures?
- Is the work flow improperly organized (is a worker required to make movements that are too rapid)?
- How are dust and chemicals dispersed in the air?
- What are the sources of noise, radiation, heat, and cold?
- Will a worker come in contact with sharp surfaces?
- Are there guards in place to prevent an employee from reaching into moving machinery?

In addition, the contractor shall use the following list as a guide in determining the construction activity hazards analyses for various high-hazard operations and critical tasks.

- **Pre-mobilization inspection.** Conduct an initial site inspection for prejob planning. The inspection should cover potential exposures such as the location of electrical lines, underground utilities, nearby structures, traffic conditions, site security needs, public exposures general liability, and other potential exposures.
- **Water, wastewater, and marine work.** Analyze work adjacent to, in, or over water (including lakes, canals, dams, treatment plants, water tanks, clarifiers, and reservoirs) for hazards.
- **Traffic controls.** Plan the traffic controls for delivery of equipment or materials as well as any equipment operations. Control measures include warning signs, flagmen, traffic stoppage and control, and unloading procedures.
- **Material storage.** Consider where materials and equipment will be stored on site. Implement measures to protect against vandalism and theft of tools, equipment, or materials. Also consider the hazards that may exist for workers when they are storing or retrieving those materials.
- **Material handling.** Consider the size and weight of loads, the equipment to be used, how the equipment is set up and protected, and safety and maintenance inspections of material handling and rigging equipment. Also consider employee training in the use of the equipment or personal body mechanics when engaged in manual material handling activities.
- **Heavy equipment controls.** Evaluate the use of heavy equipment in operations such as site clearing, grading, and excavation or lifting. Controls should include equipment

## RA HEALTH AND SAFETY PLAN

alarms, use of qualified operators, preuse inspections, and any specific OSHA regulatory requirements.

- **Fall protection.** Safety harnesses and secured safety lanyards or retractable lifelines must be used when working from unguarded work surfaces where falls greater than 6 feet/1.8m present a hazard. (NOTE: Site requirements may limit this potential fall length to 4 feet/1.2m). Lanyards or retractable lifelines must be secured to separate lifelines and independent connection points capable of withstanding the load of a potential fall.
- **Steel erection.** Subcontractors erecting steel must comply with applicable regulations of OSHA 1926.750 and the Steel Erection Negotiated Rule Advisory Committee (SENRAC).
- **Personal protective equipment.** Consider operations where PPE is required and the type of PPE required, e.g., eye, head, foot, respiratory, hearing and hand protection, and types of special protective clothing.
- **Portable hand and power tools.** Evaluate the tools to be used and the ways that workers are protected from the hazards associated with the use of tools. Consider tool maintenance requirements; electrical requirements; the use of ground fault circuit interrupters, grounding, extension cords, and tool inspection procedures; and employee training and PPE requirements.
- **On-site traffic.** Internal traffic control plans should include ways to restrict the number of vehicles on site, the flow of vehicles through the site, haul roads, speed controls, subcontractor employee parking areas, merging of site traffic with local vehicle traffic, pedestrian controls in traffic zones, access by emergency and rescue vehicles, and operator controls.
- **Employee training.** Always review the safety training needs of employees. Training should include initial site safety orientations and chemical hazard communication training. Some operations (e.g., excavation, blasting, scaffold erection, tunneling, confined space, operating heavy equipment, and working in highly hazardous plant process operations) may require special training that should be checked and evaluated.
- **Confined spaces.** Confined space work requires special consideration, evaluation, and controls. Each space should be reviewed for regulatory compliance.
- **Crane operations.** Consider special requirements for operations, maintenance, and heavy lifting operation. All lifts must be planned in accordance with the limitations of cranes being used.
- **Excavations and trenching.** These activities require complete analysis of existing underground exposures, soils, sloping and shoring methods, equipment, and

## RA HEALTH AND SAFETY PLAN

engineering if depth of trench or excavations exceeds four feet. A JSA is recommended for all trenching operations.

- **Concrete formwork and placement.** Adequate access and egress to elevated concrete work is essential to the safe and quality placement of concrete work. Work involving concrete should consider protective measures such as staging, platforms, handrails, and other passive forms of employee protection.
- **Process safety management.** At process sites where highly hazardous chemicals are stored or used, comply with special considerations and process safety management OSHA regulations.
- **Mechanical, electrical, and piping.** Evaluate all work associated with the installation, repair, and maintenance of mechanical, piping and electrical work for interferences, LOTO, line break procedures, and applicable customer requirements.
- **Hazard communication.** A site-specific hazard communication plan is required to be developed by the contractor. A copy of a material safety data sheet (MSDS) for each chemical brought to the site will be maintained by the Contractor with a copy sent to the CM. Containers will meet the National Fire Protection Association (NFPA) standards for storage. Labels on containers will be visible and readable.

Other requirements during RA activities include the following:

- Alcoholic beverages, recreational drugs, and people under the influence of these substances are not permitted on site.
- Weapons and firearms are strictly prohibited.
- No food or drink will be allowed in the construction work area except in the designated eating area.
- Music radios/headsets are prohibited.
- No cameras or video equipment are permitted on site except as necessary to document the progress of the work and as may be allowed under the specific site security guidelines.
- Smoking is not permitted in any building (including the building footprint and roof). Smoking is allowed in designated areas only.
- Horseplay and fighting is prohibited.
- Barricaded or roped off areas are considered danger zones and should be respected as such. Admittance to such areas is prohibited without authorization.
- Protect floor openings by providing adequate barricades and secured covers. All covers must be painted with high visibility paint or shall be marked with the word "HOLE" or "COVER" to provide warning of the hazard.

## **RA HEALTH AND SAFETY PLAN**

- No one will be allowed to enter the site without proper identification. All trade workers, vendors, and visitors must comply with the CM's badge and access program.
- Do not prop open exit doors.
- Throwing or dropping materials from one level to another is prohibited.
- No toxic chemicals or other types of pollutants may be disposed of in the on-site sewerage systems, either storm or sanitary.
- All gas cans and other liquid chemicals must remain in secondary containment devices.
- No riding in the back of pick-up trucks.
- Park in designated contractor-parking areas. The driver of any motor vehicle on company property is responsible for its safe condition and use. The vehicle owner must promptly correct any malfunction of brakes, lights, horn, or exhaust system. The driver is required to have a valid driver's license and the vehicle must have a valid license plate. All traffic rules must be obeyed, and pedestrians have the right of way at the site.
- All deliveries and use of special equipment will be through areas designated by the CM. The CM will designate staging and storage areas for construction use. All contractors must schedule and coordinate deliveries in order to minimize the necessity of storing materials prior to installation.
- Talking on cell phones or using music headsets while operating project equipment is prohibited.

### **4.3 WATER SAFETY**

Contractor personnel working over, near or adjacent to water, or where the danger of drowning exists, must wear a USCG-approved Commercial Type I, II, or III personal flotation device (PFD), appropriate to the circumstance. Other Types of USCG-approved PFDs must be approved by the CM prior to their use. The PFD shall be equipped with an attached emergency whistle and a light that is activated when submerged in water. PFDs shall be capable of rolling over an unconscious person to ensure that they will float face up. All PFDs shall be colored "International Orange" and will have SOLAS-grade reflective panels. Self-inflating PFDs will not be allowed on the project. Prior to and after each use, the PFD must be inspected for defects that would alter their strength and buoyancy. Defective units must be removed from service.

Ring buoys with at least 90 feet of line must be provided and readily available for emergency rescue operations. Distance of working personnel from ring buoys may not exceed 200 feet. Some means of rescue (e.g., a ring buoy or boat) must be immediately available at locations where personnel are working over or adjacent to water.

# **RA HEALTH AND SAFETY PLAN**

Employees walking or working on the unguarded decks of barges, support vessels, floating platforms, and piers or docks shall be protected with U.S. Coast Guard-approved personal flotation devices. Fall protection shall also be provided if there is a possibility that persons could fall six or more feet to a lower level, deck, tethered vessel, or dock / pier.

The operator/skipper of each boat must complete a USCG boating safety training course prior to conducting work on the river. Each operator/skipper must demonstrate proficiency in the following subject areas: proper operation of a boat; boat and safety equipment inspections; content and frequency of equipment safety inspections; proper use of on-board safety equipment, including fire extinguisher, radio or cellular phone, flares, horn, etc.; proper procedures on the completion and filing of a float plan; appropriate boating “rules-of-the-road;” emergency procedures in the event of capsizing or being thrown overboard; and different types of PFDs and their proper inspection and use.

Prior to each day or shift of operations, a boat inspection must be conducted by the boat operator/skipper. This inspection must be conducted in accordance with accepted USCG and any applicable state boating safety inspection procedures. The inspection must verify that necessary safety equipment is aboard, functioning properly, and all members of the crew are aware of proper procedures that are to be followed upon the water. In addition, this information must be reviewed during the daily toolbox safety meeting to confirm that the procedures have been followed and all crew members are satisfied as to its completion.

It will be the responsibility of the site supervisor to verify that daily boat/PFD/equipment inspections are completed and documented, and daily toolbox safety meetings are conducted and documented.

## **4.4 LOCKOUT/TAGOUT PROCEDURES**

The LOTO standard applies, but is not limited to, activities that are performed on a machine, a piece of equipment, a process, or circuit. Primary, secondary, stored, and single-source energy sources require a lockout when performing servicing and/or maintenance activities. Primary energy sources are the main energy sources such as electricity, gas, fluids, etc., provided to machines, equipment, processes, and circuits. Shut down machinery with moving parts or process equipment in service before adjustments or repairs. GE’s LOTO procedures must be followed. See GE Environmental, Health and Safety (EHS) Requirements in Appendix B.

If shutdown is not feasible, a risk assessment must be used. The risk assessment explores the safest conditions possible for individual work assignments. Risk assessment establishes safe practices and alternative methods to reduce the possibility of injury when normal LOTO procedures cannot be applied. A task hazard analysis (mitigation plan) and written procedures specific for the job must be completed and reviewed with the CM prior to start.

# **RA HEALTH AND SAFETY PLAN**

Never remove warning or danger tags or locks on any apparatus, valves, or switches unless you have been instructed to do so, and then only by the persons who attached them.

Contractors who are involved with equipment/systems and are potentially exposed must implement procedures that provide protection equal to or better than the GE LOTO program. LOTO programs for outside services or contractors must be reviewed by authorized CM personnel.

The contractor supervisor must be made aware of the overall LOTO procedure and informed of the equipment specific procedure by the CM.

Contractors must place their own locks and tags (one lock, one key, one person) and verify LOTO by try-out. As a best practice, the CM may perform the LOTO step-by-step process. The contractor will then be required to attach and secure their individual LOTO locks and red tags to the same energy-isolating devices that the CM has locked out and validate zero energy by try-out.

All contractor workers involved in a LOTO operation must have documentation of LOTO training. This documentation must be available for audit at the work site.

## **4.5 FIRE PREVENTION/HOT WORK PROCEDURES**

Smoking will only be allowed in designated areas. The CM will review contractor requests for specified smoking areas. Contractor will be responsible for providing fire extinguisher, sand pail, and overall housekeeping and maintenance of their smoking area.

Use only approved cleaning agents — never gasoline or flammable liquids. Gasoline and similar flammable liquids must be stored only in approved safety containers and in areas free of burning hazards. Keep all heat sources from flammable liquids, gases, or other combustible materials. Open fires are strictly prohibited.

Every hot work operation must have a properly trained and equipped fire watch with appropriate fire extinguishers for the specific hazard in the work area. The fire watch must remain in the work area for at least 30 minutes after the hot work activity is completed.

To avoid accidental displacement, keep compressed gas cylinders standing and securely tied off, whether empty or full. Make sure valve protection caps are on when cylinders are not in use. The valve shall be closed on all empty cylinders.

When moving cylinders by crane or derrick; a cradle, boat, or suitable platform shall be used. Slings or hooks shall not be used.

## **RA HEALTH AND SAFETY PLAN**

When cylinders are not in use, they must be secured and capped. If cylinders are not used within a 24-hour period, they are considered to be in storage, and must be secured, capped, and separated. Separate oxygen and fuel gas cylinders by a minimum of 20 feet or a 5-foot high, ½-hour fire-rated barrier. In lieu of removing the cylinders for storage as noted above, a gas cylinder cart with an engineered steel fire barrier (where as the steel barrier has been engineered specifically to meet a ½-hour fire resistance rating and to prevent a fire in one cylinder from spreading to the other cylinder on the cart, and the barrier is also depicted as meeting the standard's height requirement of at least 5 feet high) would be acceptable in order to comply with §1926.350(a)(10).

It will be necessary to perform hot work such as welding, cutting, and grinding at various times during the project. Before any hot work can be performed, certain precautions must be taken and conditions met to determine that hot work efforts can be performed safely. The following are required:

- An initial site survey must be made by the contractor to determine that the area is free of flammable and combustible materials.
- Good housekeeping practices must be maintained at all sites that require hot work.
- Adequate fire extinguishing equipment must be in place and readily accessible at all hot work locations, and employees must be properly trained in the use of such equipment.
- Contractor will request a hot work permit (Attachment D), to be issued by CM. The request must be made at least four hours before beginning work.
- A firewatch must be provided as necessary and remain in place for 30 minutes after completion of work when conditions warrant and are so specified on the hot work permit. The firewatch must be trained to use the required fire extinguisher and hose, and be familiar with the position's responsibilities.

### **4.6 CONFINED SPACE PROCEDURES**

A confined space is an enclosed area that has each of the following four characteristics:

1. Large enough and so configured that a worker can bodily enter and perform assigned work;
2. Has limited means for worker entry and exit due to the number, size, or location of openings;
3. Is not designed for continuous worker occupancy; and
4. Contains or may contain a serious safety or health hazard.

# RA HEALTH AND SAFETY PLAN

Such hazards include currently or potentially hazardous atmospheres, potential worker entrapment (from inwardly converging walls or downward sloping floor), or potential worker engulfed by stored materials. Examples of confined spaces include tanks, vessels, pits, sewers, pipelines, boilers, and utility vaults.

It will be assumed that all confined spaces are Permit Required Confined Spaces (PRCS's) and will be entered, as such, in accordance with the requirements of 29 CFR 1910.146 unless they can be shown and documented by a competent person to be a non-permit required confined space. Entry into a confined space shall be conducted only if necessary to do assigned work. Whenever possible, assigned work shall be completed from outside the space.

Entry into a confined space is prohibited until atmospheric testing of the space and applicable entry procedures have been documented and permits completed. See Attachment E for confined space entry permit.

All contractor entrants and attendants must have documentation of confined space entry/attendant training. Additional respiratory protection training and documentation will be required (if respiratory protection is needed). This documentation must be available for audit at the work site.

All entrants and attendants must be informed of the entry procedures, permit requirements, air monitoring results, hazard mitigation plan and rescue plan prior to the entry. The use of appropriate retrieval equipment or other approved means of rescue is required for all confined space entries. The number of retrieval or rescue devices must be equal to number of entrants. An attendant shall be posted for the duration of entry and may not enter the confined space, leave their post nor be assigned any other duties that would distract them from their role as attendant.

## 4.7 FALL PROTECTION PROCEDURES

All workers in an area exposed to a fall greater than six feet must use appropriate fall protection. Such protection may include:

- Guardrail systems;
- Safety net systems; and
- Personal fall arrest systems.

Other protection methods include:

- Hole covers;
- Positioning device systems;
- Equipment guards;
- Fences and barricades; and

## RA HEALTH AND SAFETY PLAN

- Warning line systems set back a safe distance from the hazard, in combination with guardrail systems, safety net systems, personal fall arrest systems, or safety monitoring systems.

One hundred per cent fall protection is required but not limited to the following when a worker is exposed to a fall of six feet or more:

- Working on barges with exposed hoppers or perimeters;
- Performing steel erection work;
- Working on scaffolds;
- Unprotected sides and edges;
- Overhand bricklaying and related work;
- Leading edges;
- Roofing work on low-slope roofs;
- Hoist areas;
- Steep roofs;
- Holes;
- Precast concrete erection;
- Formwork and reinforcing steel;
- Wall openings;
- Ramps, runways, and other walkways;
- Walking/working surfaces;
- Excavations;
- Aerial lifts;
- Dangerous equipment;
- Metal decking operations; and
- Erecting, dismantling, and working on scaffolds.

Trades people shall not stand on motors, pumps, conduits, mid or upper-rails of aerial or articulating lifts, or the like to gain access to elevated work. Use of safety monitor system (SMS), controlled access zone (CAZ), or controlled decking zone (CDZ) will not be accepted unless prior approval from GE's Environmental, Health and Safety (EHS) program manager has been received.

## RA HEALTH AND SAFETY PLAN

Working on a roof within six feet of the edge or a floor opening requires appropriate fall protection (guardrail systems, safety net systems, or personal fall arrest systems). Use of a safety monitor system or controlled access zone will not be accepted without prior approval from GE's EHS program manager.

A full-body safety harness must be worn at all times in articulating scissors and personnel lifts. Chains must be closed. Harnesses must be secured to an approved tie-off point when breaking the plain of the lift. Safety harnesses must be secured to an approved tie-off point in all aerial lifts. Establish a barricaded or roped off danger zone around lifts for falling objects.

Hoisting of personnel on a personnel platform by a crane or derrick is prohibited, except when the erection, use, and dismantling of conventional means of reaching the worksite, such as a personnel hoist, ladder, stairway, aerial lift, elevating work platform, or scaffold, would be more hazardous or is not possible because of structural design or worksite conditions. This type of operation must meet the requirements of OSHA 1926.550(g).

Workers must wear a full-body safety harness with his/her safety lanyard secured to a separate lifeline while working from swing scaffolds, boatswain's chairs, or other suspended work platforms where a fall hazard is present.

Contractor must develop a written fall protection program and communicate it to all affected employees. The program will contain the following elements:

- Hazard identification;
- Selection of fall hazard control;
- Equipment inspection and maintenance;
- Rescue and retrieval methods for employees involved in a fall; and
- Employee training.

Contractor must conduct a fall hazard assessment to address both routine ongoing activities and tasks as well temporary activities, which may take place during maintenance and construction. Control measures will be identified, implemented, and communicated by the contractor. Documentation of fall hazard control measures should be included in JSAs, safe work plans, or other operating procedures.

Contractor workers must be trained in the requirements of the fall protection program including use of fall protection equipment as appropriate. Contractors must inspect and maintain fall protection equipment in accordance with manufacturer's recommendations.

Barges or other marine equipment that are not fitted with guard rail systems shall meet applicable fall protection requirements.

# **RA HEALTH AND SAFETY PLAN**

## **4.8 CRANES, HOISTING, AND RIGGING**

Never raise a load over people or occupied buildings. Tag lines must be used to control every load. Rigging operations utilizing chains is not permitted without prior approval from GE EHS program manager. Multiple-lift rigging is strictly prohibited. All materials shall be rigged to prevent unintentional displacement. Hooks with self-closing safety latches shall be used to prevent components from slipping out of the hook. Rigging must be in good condition, appropriate for the lift and tagged with a manufacturer's rating tag. Defective rigging equipment, or rigging without a manufacturer's rating tag shall be labeled "Do Not Use," and removed from service

Only qualified operators may operate power equipment. Seat belts must be worn where applicable.

Safe lifting procedures for cranes and hoists must be developed and documented. Crane and hoist operators and qualified riggers must conduct documented rigging equipment inspections prior to each use on each shift and as necessary during its use to ensure that it is safe.

All operators of cranes and hoists should have received training that addresses safe operating practices for all crane types that they will be operating on site.

Preventative maintenance must be conducted on cranes and hoists in accordance with manufacturer's guidance or local regulatory requirements.

Contractors must submit copies of detailed and documented annual inspections conducted by qualified individuals.

Operators of tower cranes, derricks, and mobile cranes must possess a current Certificate of Competence. Operator certification and crane operations must comply with all applicable requirements of New York State Code Rule 23, Subpart 23-8.

Riding on hooks, headache balls, or slings of hoisting equipment is strictly prohibited.

## **4.9 SCAFFOLDING**

All scaffolds must be inspected before use and must be designed for the safe working load. Only scaffold planking tested and approved to carry the load may be used. Scaffold planking must be secured by tying or cleats to prevent slipping. Mark scaffold planks (in most cases the manufacturer does this) and use only on scaffolds.

Handrails and toe boards shall be used on all scaffolds and the scaffold secured as required. Rolling tower scaffolds must be locked while the scaffold is in use. Tower must be free of personnel, material, and equipment before being moved. Rolling scaffolds are not to be moved from the top. Ladders must be used for accessing scaffolds. Climbing of bracing is prohibited.

## **RA HEALTH AND SAFETY PLAN**

Scaffold platforms 6 feet or more above any working surface must be equipped with a guardrail system – Top rails (42 inches plus or minus 3 inches), mid rails (midway between the top rail and the scaffold platform), and toe boards or personal fall arrest systems must be implemented.

No scaffold shall be erected, moved, dismantled, or altered except by trained and qualified personnel under the authority of the competent person. Personnel erecting or dismantling scaffolding must adhere to fall protection standards above 6 feet.

Abide by the scaffold tag system:

- *GREEN*—complete scaffold per required safety standards.
- *YELLOW*—conditional use — 100% fall protection required.
- *RED*—Scaffold not complete. Do Not Use.

Makeshift platforms, such as stacked materials, chairs, boxes, or drums shall not be used. Scaffolds shall be built to OSHA standards (1926.451).

Tubular welded frame scaffolds have additional special safety requirements: Scaffold legs shall be set on adjustable bases, plain bases, or other foundations adequate to support the maximum rated load. To prevent movement, the scaffold shall be secured to the building or structure at intervals not to exceed 30 feet horizontally and 26 feet vertically. All pins to secure diagonal braces and to prevent uplift shall be used. Outriggers and platforms below the working/walking level shall be fully planked. Outriggers shall be tied to the frame. Scaffolds may not be used as material hoist towers or for mounting derricks without first determining the loads and stress involved. All scaffolds shall be free of tools, trash, etc. before calling in for removal.

### **4.10 ELECTRICAL SAFETY**

Electrical equipment shall not be installed, repaired, or removed except by trained qualified electricians. Electrically operated equipment (stationary and portable) must be grounded.

When extension cords, power tools or equipment cords are frayed or worn, or when bare wire is showing, the equipment must be tagged and taken out of service. Do not use electrical tape on extension cords. Temporary cords should be supported a minimum of eight feet above the floor in egress walkways, corridors and areas requiring employee access. Temporary lighting must be guarded.

All 120-volt, single phase 15- and 20-ampere receptacle outlets on construction sites, which are not a part of the permanent wiring of the building or structure and are in use by employees, shall have approved ground fault circuit interruption (GFCI) for personnel protection. When

## **RA HEALTH AND SAFETY PLAN**

using the permanent receptacles, GFCI devices must be installed on each extension cord prior to the source receptacle.

LOTO programs represent a lifesaving control. Compliance with GE's procedures is mandatory. Equipment-specific energy control procedures are required for all LOTO operations.

Extension cords must be at least 16-gauge heavy duty three-wire with a UL approved three prong grounded plug. 110-volt outlets on portable generators and welders shall be three-way (NEMA 5-15R) grounded to the frame. The power lead shall be connected through a GFCI.

### **4.11 HAND AND POWER TOOLS**

All hand and power tools must be the appropriate tool for the job. They must be inspected prior to use.

Defective tools and equipment must be taken out of service and shall be properly repaired before reuse. Machinery, tools (including portable grinders and buffers) and equipment with exposed gears, belts, power transmission, couplings, etc. shall not be operated without effective guards in place.

The use of gasoline and propane powered equipment in the building is strictly prohibited unless specific permission is granted by the CM.

Operators of powder actuated tools (e.g. Hilti, RamSet) must have documented safety training in the use of such tool.

### **4.12 LADDER SAFETY**

All ladders shall be heavy duty, industrial strength fiberglass/composite construction. The use of metal/aluminum and wooden ladders is prohibited unless approved for a specific purpose in advance by the CM.

Stepladders must be fully opened and used as intended. They cannot be used as straight ladders. Tie-off all straight and extension ladders to keep them secure. Straight and extension ladders must extend at least three feet beyond the top landing. The base of the ladder shall be set out at least one-fourth of the ladder height measured from bottom to point of bearing.

Any ladder found defective shall be tagged, removed from service and either destroyed (vertically) or repaired to original specifications.

Do not place ladders in blind spots (doorways, driveways) or in egress ways unless properly barricaded or guarded.

# RA HEALTH AND SAFETY PLAN

## 4.13 HOUSEKEEPING

Cleanliness and orderliness are the first fundamentals of good housekeeping. Contractors are responsible for cleaning up and removing hazardous and non-hazardous waste generated on site. Each contractor shall be responsible for maintaining work areas free from waste materials, debris, and rubbish. Work will not be considered complete until all waste materials are removed and the work area returned to a clean and orderly condition. Waste material must be disposed of off-site.

All protruding nails in form lumber, boards, etc., must be withdrawn or bent into the wood before the wood is stacked or piled.

Rags, packing materials, paper cups, and sawdust in saw areas must be collected daily and placed in proper containers.

All objects with sharp edges (scrap sheet metal, scrap glass, bottles, metal cans) shall be collected daily and placed in containers.

Avoid placing debris and other obstacles in roadways, walkways, aisles, and other travel routes.

Allow sufficient time at the end of each day for proper cleanup of the work area. Place all debris in proper refuse containers.

All stored material must be kept in an orderly manner at all times.

Provide a proper collection container and floor protection when using cutting oil, solder flux, hydraulic oil, and other fluids. Rags containing oil, hydraulic fluid or other combustible fluids shall not be placed in trash containers with the other wastes, shall not be placed in containers left inside buildings and shall be disposed of in accordance with applicable hazardous waste regulations. In the event of a large spill, immediately install acceptable containment barriers.

## 4.14 STEEL ERECTION

The safety standards for structural steel erection will follow the OSHA regulations for Steel Erection Subpart R (1926.750-1926.761 inclusive of Appendices A-H) dated January 18, 2001 and revised on July 18, 2001 with the following exceptions and additions:

- All workers including connectors and deckers must be protected from falls at or greater than 6 feet (1.8m).
- Multiple lift rigging procedures (Christmas treeing) is strictly prohibited.
- The use of a CDZ is prohibited.

## RA HEALTH AND SAFETY PLAN

Cranes used in steel erection activities shall be visually inspected prior to each shift by a competent person. The inspection must include observation for deficiencies during operation. The inspection must be written and a copy submitted to the CM daily. Deficiencies constituting a hazard require that the hoisting equipment be removed from service until the deficiency is corrected.

At the end of the shift or when environmental or jobsite conditions require, metal decking must be secured against displacement. Metal decking must be laid tightly and immediately secured upon placement to prevent accidental movement or displacement.

Wire mesh, exterior plywood, or equivalent must be installed around columns where planks or metal decking do not fit tightly. The materials used must provide fall protection for personnel and prevent objects from falling through.

All columns must be anchored by a minimum of four anchor bolts. Anchor bolts should not be repaired, replaced, or field modified without the approval of the project structural engineer of record.

### 4.15 DIVING SAFETY

Any diving operations conducted by the Facility Site Work Construction Contractor, Processing Facility Operations Contractor, Dredging Contractor, and Habitat Construction Contractor or subcontractors are considered with no exception to be commercial diving operations, and not scientific diving. All other diving operations conducted during the project are considered to be commercial diving operations, exceptions to this rule can only be granted after a written request to use scientific diving procedures has been reviewed and approved by the CM.

Each contractor involved in commercial diving operations must comply with all applicable requirements of OSHA's Commercial Diving Standard (29 CFR 1910 Subpart T). They must develop a *Safe Practices Manual* as per 29 CFR 1910.420(b) for their diving operations before beginning work. The Manual shall be made available at the dive location to each dive team member. This manual must include:

- A copy of the OSHA Commercial Diving Standard and the employer's policies for implementing the requirements of this standard.
- Safety procedures and checklists for diving operations;
- Assignments and responsibilities of the dive team members;
- Equipment procedures and checklists; and
- Emergency procedures.

# RA HEALTH AND SAFETY PLAN

For scientific diving, an example of a *Diving Safety Manual* is presented in Appendix C. The manual presents guidelines covering all scientific diving operations specific to the project, including criteria for diver training and authorization, safe diving procedures, equipment specifications, procedures for emergency care, recompression, and evacuation. The manual includes:

- Safety procedures and checklists for diving operations;
- Assignments and responsibilities of the dive team members;
- Equipment procedures and checklists; and
- Emergency procedures.

Use of the Diving Safety Manual and associated procedures for scientific diving *may not* be substituted for commercial diving procedures and a Safe Practices Manual for commercial diving.

## 4.15.1 General

General diving safety requirements are summarized below:

- Contractors engaged in commercial diving must develop and follow a *Safe Practices Manual*.
- All diving activities must be conducted with two comparably equipped divers in the water in constant communication.
- All diving will be from boats or an approved shoreline work location.
- No night diving will occur.
- All diving will be conducted with scuba equipment or approved surface supplied air systems.
- No diving will be conducted at depths greater than 35 feet.
- No diving will be conducted in enclosed or physically confining spaces.
- No diving will be conducted against currents exceeding 1 knot unless line-tended.
- No diving will take place if surface visibility is less than 200 feet at that given location.
- The diver must terminate a scuba dive while there is still sufficient cylinder pressure remaining (generally, 500 pounds per square inch [psi]) to permit the diver to safely reach the surface, including required in-water decompression time, if applicable. For purposes of this project, in-water decompression is not likely due to the shallow depths at which work will be performed.
- All dives require a task specific “Dive Plan” for each individual diving assignment.

# RA HEALTH AND SAFETY PLAN

## 4.15.2 Training

Each diver must possess a nationally recognized diving certificate. Each diver will be assigned tasks in accordance with their experience and training. Each diver must be trained, qualified, and authorized for the diving mode and specialized equipment being used, the diving activity to be performed, and the depths at which the dive is to be conducted.

Tasks may be assigned to an individual who has not previously performed the specific task, provided that these tasks are performed under the direct supervision of an experienced dive team member.

All dive team members must be trained in CPR and first aid (American Red Cross standard course or equivalent).

## 4.15.3 Dive Planning

Planning of each diving operation will include an assessment of the safety and health aspects of each task. Planning elements include:

- Diving mode;
- Safe entry procedures, considering underwater obstructions or shallow depths;
- Procedures and engineering controls to preclude contact with propellers;
- Surface and underwater conditions and hazards;
- Breathing gas supply (including reserves);
- Thermal protection;
- Diving equipment and systems; and
- Dive team assignments and physical fitness of dive team members Emergency procedures.
- The diving contractor will provide a task specific “Dive Plan” for each individual diving assignment. Each task specific Dive Plan must be approved by the CM before the diving operation can begin.

To minimize hazards to the dive team, diving operations must be coordinated with other activities in the vicinity that could potentially interfere with the diving operation, including recreational activities as well as commercial activities.

## 4.15.4 Dive Site Preparation

Appropriate protocols such as dive flagging will be used to alert boaters where diving operations are underway. A warning horn and hailing device shall be available to communicate

# RA HEALTH AND SAFETY PLAN

with other vessels, including small craft which might not be equipped with VHF radio communication.

During the pre-dive briefing, all dive team members will receive a briefing by the Diving Safety Officer (DSO) on the following topics:

- Tasks to be undertaken;
- Safety procedures for the diving mode;
- Any unusual hazards or environmental conditions likely to affect the safety of the diving operation; and
- Any modifications to operating procedures necessitated by the specific diving operation.

Prior to making individual dive team member assignments, the DSO must inquire into each dive team member's current state of physical fitness, and indicate to the dive team member the procedure for reporting physical problems or adverse physiological effects during and after the dive.

## 4.15.5 Equipment Inspection

The procedures listed below must be followed when conducting equipment inspection:

- Each diver must conduct a functional check of his/her diving equipment in the presence of the DSO. Each diver must verify that his/her equipment is in proper working order, and that the equipment is suitable and sufficient for the type of diving operation planned. The DSO must verify that the equipment check has been performed.
- Each diver must have a submersible pressure gauge for monitoring scuba cylinder pressure, capable of being monitored by the diver during the dive.
- Each diver must have the capability of achieving and maintaining positive buoyancy on the surface.
- Each diver must have the capability to execute a controlled neutrally buoyant ascent, through the use of an approved buoyancy control device.
- The entire scuba apparatus for each diver must be inspected by the diver and DSO prior to the dive. Critical inspection points include the breathing gas supply system, masks, thermal protection, and weights.
- The proper function of the cylinder pressure gauge must be inspected by each scuba diver and verified by the DSO.
- The pre-dive briefing and equipment inspection shall be documented.

# RA HEALTH AND SAFETY PLAN

## 4.15.6 Water Entry and Exit

The procedures listed below must be followed when entering and exiting the water:

- A means capable of supporting the diver will be provided for entering and exiting the water, unless the entry is in water of wading depth. The means provided for exiting the water must extend below the water surface.
- A means will be provided to assist an injured diver from the water.
- Safe entry procedures must consider underwater obstructions or shallow depths.

## 4.15.7 Emergency Procedures

The procedures listed below must be followed in the event of an emergency during underwater operations:

- A standby diver must be available any time a diver is in the water;
- Divers must be line-tended from the surface, or accompanied by another diver in the water in continuous visual contact during the diving operations;
- A diver-carried reserve breathing gas supply must be provided for each diver. The reserve must be either a manual reserve (J valve), or an independent reserve cylinder with a separate regulator or connected to the underwater breathing apparatus; and
- The valve of the reserve breathing gas supply must be in the closed position prior to the dive.

## 4.16 SOFT / HARD LINES

Soft lines (e.g. synthetic rope) and hard lines (e.g. wire rope) shall be inspected as specified by the manufacturer, by a competent person, before use on each shift and as necessary during its use to ensure it is safe.

For hard lines, when two or more wires are broken or rust or corrosion is found adjacent to a socket or end fitting, or any other defect is found that would make the line unfit for service, the wire rope shall be removed from service or re-socketed.

High strength, lightweight soft lines (typically synthetic) shall be used in lieu of traditional heavy, low strength (typically natural materials) soft lines. Soft lines shall not be used if they are frozen or if they have been subjected to acids, corrosives, strong chemicals or excessive heat. Soft lines shall be protected from abrasion by padding where they are fastened or drawn over square corners, sharp edges, rough surfaces or other points of wear.

The use and maintenance of soft and hard lines shall be in accordance with recommendations of the manufacturer, and within the safe working load of the line. Lines, when not in use, shall be properly stored and maintained in a safe condition.

# RA HEALTH AND SAFETY PLAN

Safe handling procedures for soft and hard lines shall be developed by any contractor using lines to secure a marine vessel (e.g., barges, dredges, tug boat, etc). Contractor personnel shall receive documented training that will include, but is not limited to; hand protection, pinch points, properly securing lines to bollards and cleats, body and hand positioning when handling or releasing lines, lines under load or tension, line selection, inspection techniques, line life factors, line working loads, broken lines, and wire rope clip spacing and orientation.

## 4.17 ENVIRONMENTAL HAZARDS

### 4.17.1 Heat Stress

Heat stress is caused by a number of interacting factors, including environmental conditions, clothing, workload, etc., as well as the physical and conditioning characteristics of the individual. Since heat stress is one of the most common illnesses associated with heavy outdoor work conducted with direct solar load and, in particular, because wearing PPE can increase the risk of developing heat stress, workers must be capable of recognizing the signs and symptoms of heat-related illnesses. Personnel must be aware of the types and causes of heat-related illnesses and be able to recognize the signs and symptoms of these illnesses in both themselves and their co-workers.

#### **Hazards**

*Heat rashes* are one of the most common problems in hot work environments. Commonly known as prickly heat, a heat rash is manifested as red papules and usually appears in areas where the clothing is restrictive. As sweating increases, these papules give rise to a prickling sensation. Prickly heat occurs in skin that is persistently wetted by unevaporated sweat, and heat rash papules may become infected if they are not treated. In most cases, heat rashes will disappear when the affected individual returns to a cool environment and cleans the skin surface.

*Heat cramps* are usually caused by performing hard physical labor in a hot environment. These cramps have been attributed to an electrolyte imbalance caused by sweating. It is important to understand that cramps can be caused both by too much or too little salt.

Cramps appear to be caused by the lack of water replenishment. Because sweat is a hypotonic solution (plus or minus 0.3% NaCl), excess salt can build up in the body if the water lost through sweating is not replaced. Thirst cannot be relied on as a guide to the need for water; instead, water must be taken every 15 to 20 minutes in hot environments.

Under extreme conditions, such as working for six to eight hours in heavy protective gear, a loss of sodium may occur. Drinking commercially available carbohydrate electrolyte replacement liquids can be effective in minimizing physiological disturbances during recovery. Their use should be evaluated by Contractor's SSO/SSHO.

## RA HEALTH AND SAFETY PLAN

*Heat exhaustion* occurs from increased stress on various body organs due to inadequate blood circulation, cardiovascular insufficiency, or dehydration. Signs and symptoms include pale, cool, and moist skin; heavy sweating; dizziness; nausea; headache; vertigo; weakness; thirst; and giddiness. Fortunately, this condition responds readily to prompt treatment.

Heat exhaustion should not be dismissed lightly, however, for several reasons. One is that the fainting associated with heat exhaustion can be dangerous because the victim may be operating machinery or controlling an operation that should not be left unattended; moreover, the victim may be injured when he or she faints. Also, the signs and symptoms seen in heat exhaustion are similar to those of heat stroke, which is a medical emergency.

Workers suffering from heat exhaustion should be removed from the hot environment, be given fluid replacement, and be encouraged to get adequate rest.

*Heat stroke* is the most serious form of heat stress. Heat stroke occurs when the body's system of temperature regulation fails and the body's temperature rises to critical levels. This condition is caused by a combination of highly variable factors, and its occurrence is difficult to predict.

Heat stroke is a medical emergency. The primary signs and symptoms of heat stroke are confusion; irrational behavior; loss of consciousness; convulsions; a lack of sweating (usually); hot, dry skin; and an abnormally high body temperature, e.g., a rectal temperature of 105.8 degrees Fahrenheit (°F). If body temperature is too high, it causes death. The elevated metabolic temperatures caused by a combination of workload and environmental heat load, both of which contribute to heat stroke, are also highly variable and difficult to predict.

If a worker shows signs of possible heat stroke, professional medical treatment should be obtained immediately. The worker should be placed in a cool or shady area and the outer clothing should be removed. The worker's skin should be wetted and air movement around the worker should be increased to improve evaporative cooling until professional methods of cooling are initiated and the seriousness of the condition can be assessed. Fluids should be replaced as soon as possible. The medical outcome of an episode of heat stroke depends on the victim's physical fitness and the timing and effectiveness of first-aid treatment.

Regardless of the worker's protestations, no employee suspected of being ill from heat stroke should be sent home or left unattended unless a physician has specifically approved such an order.

Proper training and preventive measures will help avert serious illness and loss of work productivity. Preventing heat stress is particularly important because once someone suffers from heat stroke or exhaustion, that person may be predisposed to additional heat injuries.

# RA HEALTH AND SAFETY PLAN

## Control Measures

Heat stress monitoring and work rest cycle implementation should commence when the ambient adjusted temperature exceeds 72°F. A minimum work rest regimen and procedures for calculating ambient adjusted temperature are described in Table 1, below.

**Table 1 – Work/Rest Schedule**

Adjusted Temperature <sup>b</sup>	Work-Rest Regimen Normal Work Ensemble <sup>c</sup>	Work-Rest Regimen Impermeable Ensemble
90°F (32.2°C) or above	After each 45 minutes of work	After each 15 minutes of work
87.5° to 90°F (30.8° to 32.2°C)	After each 60 minutes of work	After each 30 minutes of work
82.5° to 87.5°F (28. 1° to 30.8°C)	After each 90 minutes of work	After each 60 minutes of work
77.5° to 82.5°F (25.3° to 28.1°C)	After each 120 minutes of work	After each 90 minutes of work
72.5° to 77.5°F (30.8° to 32.2°C)	After each 150 minutes of work	After each 120 minutes of work

Notes:

- For work levels of 250 kilocalories/hour (light-moderate type of work)
- Calculate the adjusted air temperature (ta adj) by using this equation:  $ta\ adj\ ^\circ F = ta\ ^\circ F + (13 \times \% \text{ sunshine})$ . Measure air temperature (ta) with a standard mercury-in-glass thermometer, with the bulb shielded from radiant heat. Estimate percent sunshine by judging what percent time the sun is not covered by clouds that are thick enough to produce a shadow. (100% sunshine = no cloud cover and a sharp, distinct shadow; 0% sunshine = no shadows.)
- A normal work ensemble consists of cotton coveralls or other cotton clothing with long sleeves and pants.
- The information presented above was generated using the information provided Table 8-10 of the *Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities*, National Institute for Occupational Safety and Health (NIOSH), OSHA, USCG, and USEPA (86-116, October 1985).

To determine if the work rest cycles are adequate for the personnel and specific site conditions, additional monitoring of individual heart rates will be conducted during the rest cycle. To check the heart rate, count the radial pulse for 30 seconds at the beginning of the rest period. If the heart rate exceeds 110 beats per minute, shorten the next work period by one third and maintain the same rest period.

Additionally, one or more of the following control measures can be used to help control heat stress and are mandatory if any site worker has a heart rate (measure immediately prior to rest period) exceeding 115 beats per minute:

- Site workers will be encouraged to drink plenty of water and/or electrolyte replacement fluids throughout the day. Their use should be evaluated by Contractor's SSO/SSHO.
- On-site drinking water will be kept cool (50°F to 60°F).

## RA HEALTH AND SAFETY PLAN

- A work regimen that will provide adequate rest periods for cooling down will be established, as required.
- All personnel will be advised of the dangers and symptoms of heat stroke, heat exhaustion, and heat cramps.
- Cooling devices, such as vortex tubes or cooling vests, should be used when personnel must wear impermeable clothing in conditions of extreme heat.
- Site personnel should be instructed to monitor themselves and co-workers for signs of heat stress and to take additional breaks as necessary.
- A shaded rest area must be provided. All breaks should take place in the shaded rest area.
- Site personnel must not be assigned to other tasks during breaks.
- Site personnel must remove impermeable garments during rest periods. This includes white Tyvek®-type garments.

All project personnel must be informed of the importance of adequate rest, acclimation, and proper diet in the prevention of heat stress disorders.

### 4.17.2 Cold Stress

Cold stress normally occurs in temperatures at or below freezing, or under certain circumstances, in temperatures of 40°F.

#### **Hazards**

Extreme cold for a short time may cause severe injury to exposed body surfaces or result in profound generalized cooling, causing death. Areas of the body that have high surface area-to-volume ratio, such as fingers, toes, and ears, are the most susceptible. Two factors influence the development of a cold weather injury: ambient temperature and the velocity of the wind. For instance, 10°F with a wind of 15 miles per hour (mph) is equivalent in chilling effect to still air at 18°F. An equivalent chill temperature chart relating the actual dry bulb temperature and wind velocity is presented in Table 2, below.

*Frostbite* is the generic term for a local injury resulting from cold. Several degrees of tissue damage are associated with frostbite. Frostbite of the extremities can be categorized into:

# RA HEALTH AND SAFETY PLAN

**Table 2 – Wind Chill Temperature Chart**

Estimated Wind Speed (in mph)	Actual Temperature Reading (°F)											
	50	40	30	20	10	0	-10	-20	-30	-40	-50	-60
Equivalent Chill Temperature (°F)												
Calm	50	40	30	20	10	0	-10	-20	-30	-40	-50	-60
5	48	37	27	16	6	-5	-15	-26	-36	-47	-57	-68
10	40	28	16	4	-9	-24	-33	-46	-58	-70	-83	-95
15	36	22	9	-5	-18	-32	-45	-58	-72	-85	-99	-112
20	32	18	4	-10	-25	-39	-53	-67	-82	-96	-110	-121
25	30	16	0	-15	-29	-44	-59	-74	-88	-104	-118	-133
30	28	13	-2	-18	-33	-48	-63	-79	-94	-109	-125	-140
35	27	11	-4	-20	-35	-51	-67	-82	-98	-113	-129	-145
40	26	10	-6	-21	-37	-53	-69	-85	-100	-116	-132	-148
(Wind speeds greater than 40 mph have little additional effect.)	LITTLE DANGER Maximum danger of false sense of security.				INCREASING DANGER Danger from freezing of exposed flesh within one minute.				GREAT DANGER Flesh may freeze within 30 seconds.			
Trench foot and immersion foot may occur at any point on this chart.												

Note: This chart was developed by the U.S. Army Research Institute of Environmental Medicine, Natick, MA (Source: ACGIH Threshold Limit Values for Chemical Substances and Physical Agents).

- *Frost Nip or Incipient Frostbite* — characterized by sudden blanching or whitening of skin.
- *Superficial Frostbite* — skin has a waxy or white appearance and is firm to the touch, but tissue beneath is resilient.
- *Deep Frostbite* — tissues are cold, pale, and solid; extremely serious injury.

*Systemic hypothermia* is caused by exposure to freezing or rapidly dropping temperature. It can be fatal. Its symptoms are usually exhibited in five stages:

1. Shivering;
2. Apathy, listlessness, sleepiness, and (sometimes) rapid cooling of the body to less than 95°F;
3. Unconsciousness, glassy stare, slow pulse, and slow respiratory rate;
4. Freezing of the extremities; and
5. Death.

Trauma sustained in freezing or sub-zero conditions requires special attention because an injured worker is predisposed to secondary cold injury. Special provisions must be made to prevent hypothermia and secondary freezing of damaged tissues in addition to providing for first-aid treatment. To avoid cold stress, site personnel must wear protective clothing appropriate

# RA HEALTH AND SAFETY PLAN

for the level of cold and physical activity. In addition to protective clothing, preventive safe work practices, additional training, and warming regimens may be utilized to prevent cold stress.

## Control Measures

To prevent cold stress illnesses, follow the safety precautions listed below.

- Protective gloves are typically worn during field activities. These gloves offer some thermal protection. For air temperature of 0°F or less, mittens should be used to protect the hands. For exposed skin, continuous exposure should not be permitted when air speed and temperature results in a wind chill temperature of -25°F.
- At air temperatures of 36°F or less, field personnel who become immersed in water or whose clothing becomes wet must be immediately provided with a change of clothing and be treated for hypothermia.
- If work is done at normal temperature or in a hot environment before entering the cold, the field personnel must verify that their clothing is not wet due to perspiration. If wet, field personnel must change into dry clothes prior to entering the cold area.
- If the available clothing does not give adequate protection to prevent hypothermia or frostbite, work must be modified or suspended until adequate clothing is made available or until weather conditions improve.
- Field personnel handling evaporative liquid (e.g., gasoline, alcohol, or cleaning fluids) at air temperatures below 40°F must take special precaution to avoid soaking of clothing or gloves with the liquids because of the added danger of cold injury due to evaporative cooling.

In addition, the following safe work practices should be employed to prevent cold stress.

- All field personnel will be provided with adequate cold weather gear, including insulated coveralls, gloves or mittens, and cold weather boots. Warming facilities or equipment will be provided, e.g., heated car, and utilized by field personnel as needed. When the water temperature is between 40 and 50 degrees Fahrenheit, field personnel working on the river or canal shall wear a float coat (top half of a Mustang Suit) or a one-piece survival suit. When the water temperature is less than 40 degrees Fahrenheit, field personnel shall wear either a float coat and bib-overalls (a full two-piece Mustang Suit), or a one-piece survival suit. Suits or Float Coats shall be US Coast Guard approved. If extremely cold or severe weather conditions are forecast, work activities should be postponed.
- Direct contact between bare skin and cold surfaces (less than 20°F) should be avoided. Metal tool handles and/or equipment controls should be covered by thermal insulating material.

## RA HEALTH AND SAFETY PLAN

- For work performed in a wind chill temperature at or below 10°F, workers should be under constant protective observation (buddy system). The work rate should be established to prevent heavy sweating that will result in wet clothing. For heavy work, rest periods must be taken in heated shelters and workers should be provided with an opportunity to change into dry clothing if needed.
- Field personnel should be provided the opportunity to become accustomed to cold-weather working conditions and required protective clothing.
- Work should be arranged in such a way that sitting or standing still for long periods is minimized.
- During the warming regimen (rest period), field personnel should be encouraged to remove outer clothing to permit sweat evaporation or to change into dry work clothing. Dehydration, or loss of body fluids, occurs insidiously in the cold environment and may increase susceptibility to cold injury due to a significant change in blood flow to the extremities. Fluid replacement with warm, sweet drinks and soups is recommended. The intake of coffee should be limited because of diuretic and circulatory effects.

### 4.17.3. Biological Hazards

Portions of the field work will be conducted in grassy and wooded areas along the river. Numerous biological hazards may be present, including poison ivy, snakes, thorny bushes and trees, ticks, mosquitoes, and other pests.

#### 4.17.3.1 Tick-Borne Disease

The following tick-borne diseases may present hazards when conducting field work. These diseases are transmitted primarily by the deer tick, which is smaller and redder than the common wood tick. The disease may be transmitted by immature ticks, which are small and hard to see. The tick may be as small as a period on this page.

- *Lyme Disease* — The disease commonly occurs in New York State in the spring and summer and is transmitted by the bite of infected ticks. Symptoms of Lyme disease include a rash or a peculiar red spot, like a bull's eye, which expands outward in a circular manner. The victim may have headache, weakness, fever, a stiff neck, swelling and pain in the joints, and eventually, arthritis.
- *Erlichiosis* — The disease also commonly occurs in New York State in the summer and is transmitted by the bite of infected ticks. Symptoms of erlichiosis include muscle aches, joint aches, and flu-like symptoms, but there is typically no skin rash.
- *Rocky Mountain Spotted Fever (RMSF)* — This disease is transmitted via the bite of an infected tick. The tick must be attached four to six hours before the disease-causing organism (*Rickettsia rickettsii*) becomes reactivated and can infect humans. The

## **RA HEALTH AND SAFETY PLAN**

primary symptom of RMSF is the sudden appearance of a moderate-to-high fever. The fever may persist for two to three weeks. The victim may also have a headache, deep muscle pain, and chills. A rash appears on the hands and feet on about the third day and eventually spreads to all parts of the body. For this reason, RMSF may be confused with measles or meningitis. The disease may cause death, if untreated, but if identified and treated promptly, death is uncommon.

### **Control Measures**

Tick repellent containing diethyltoluamide (DEET) should be used when working in tick-infested areas, and pant legs should be tucked into boots. In addition, workers should search the entire body every three or four hours for attached ticks. Ticks should be removed promptly and carefully without crushing, since crushing can squeeze the disease-causing organism into the skin. A gentle and steady pulling action should be used to avoid leaving the head or mouth parts in the skin. Hands should be protected with surgical gloves when removing ticks.

#### **4.17.3.2 Poisonous Plants**

##### **Hazards**

Poisonous plants may be present all along the river. Personnel should be alerted to their presence, and instructed on methods to prevent exposure.

##### **Control Measures**

The main control is to avoid contact with the plant, cover arms and hands, and frequently wash potentially exposed skin. Particular attention must be given to avoiding skin contact with objects or protective clothing that have touched the plants. Treat every surface that may have touched the plant as contaminated, and practice contamination avoidance. If skin contact is made, the area should be washed immediately with soap and water, and observed for signs of reddening.

#### **4.17.3.3 Snakes**

The possibility of encountering snakes exists, specifically for personnel working in grassy, wooded, and vegetated areas.

##### **Hazards**

Snake venoms are complex and include proteins, some of which have enzymatic activity. The effects produced by venoms include neurotoxic effects with sensory, motor, cardiac, and respiratory difficulties; cytotoxic effects on red blood cells, blood vessels, heart muscle, kidneys, and lungs; defects in coagulation; and effects from local release of substances by enzymatic actions. Other noticeable effects of venomous snake bites include swelling, edema, and pain

## **RA HEALTH AND SAFETY PLAN**

around the bite, and the development of ecchymosis (the escape of blood into tissues from ruptured blood vessels).

### **Control Measures**

To minimize the threat of snake bites, all personnel walking through vegetated areas must be aware of the potential for encountering snakes and the need to avoid actions potentiating encounters, such as turning over logs, etc. If a snake bite occurs, an attempt should be made to safely kill the snake for identification. The victim must be transported to the nearest hospital within 30 minutes; first aid consists of applying a constriction band and washing the area around the wound to remove any unabsorbed venom.

#### **4.17.3.4 Spiders**

Personnel may encounter spiders during work activities along the river.

### **Hazards**

Two spiders are of concern, the black widow and the brown recluse. Both prefer dark sheltered areas such as basements, equipment sheds and enclosures, and around woodpiles or other scattered debris. The black widow is shiny black, approximately one inch long, and found throughout the United States. There is a distinctive red hourglass marking on the underside of the black widow's body. The bite of a black widow is seldom fatal to healthy adults, but effects include respiratory distress, nausea, vomiting, and muscle spasms. The brown recluse is smaller than the black widow and gets its name from its brown coloring and behavior. The brown recluse is more prevalent in the southern United States but may be found in New York State. The brown recluse has a distinctive violin shape on the top of its body. The bite of the brown recluse is painful and the bite site ulcerates and takes many weeks to heal completely.

### **Control Measures**

To minimize the threat of spider bites, all personnel walking through vegetated areas must be aware of the potential for encountering these arachnids. Personnel need to avoid actions that may result in encounters, such as turning over logs and placing hands in dark places such as behind equipment or in corners of equipment sheds or enclosures. If a spider bite occurs, the victim must be transported to the nearest hospital as soon as possible; first aid consists of applying ice packs and washing the area around the wound to remove any unabsorbed venom.

#### **4.17.3.5 Mosquitoes**

Personnel may be exposed to mosquitoes during work activities along the river.

# RA HEALTH AND SAFETY PLAN

## Hazards

Typical exposure to mosquitoes does not present a significant hazard. However, if West Nile virus is prevalent in the area, mosquitoes can present a hazard and exposure to this virus is increased. West Nile virus results in flu-like symptoms and can be serious if not treated or in immune-compromised individuals. West Nile cases have been confirmed in New York State.

## Control Measures

To minimize the threat of mosquito bites, all personnel working outside must be aware of the potential for encountering mosquitoes and implement the basic precautions listed below:

- Avoid working at dawn or dusk when mosquitoes are most active.
- Prevent accumulation of standing water at the work site.
- Apply an insect repellent that contains DEET to exposed skin and clothing.
- Wear light colored clothes, preferably with long-sleeves and full-length pants.
- Do not touch any dead birds or animals.

If dead birds are detected near a particular work area, report to the local county health department. If flu-like symptoms are present, contact the site HSC for more information.

## **4.18 LIFTING SAFETY**

Using proper lifting techniques may prevent back strain or injury. The fundamentals of proper lifting include:

- Consider the size, shape, and weight of the object to be lifted. A mechanical lifting device or additional persons must be used to lift an object if it cannot be lifted safely alone.
- The hands and the object should be free of dirt or grease that could prevent a firm grip.
- Gloves must be used, and the object inspected for metal slivers, jagged edges, burrs, or rough or slippery surfaces.
- Fingers must be kept away from points that could crush or pinch them, especially when putting an object down.
- Feet must be placed far enough apart for balance. The footing should be solid and the intended pathway should be clear.
- The load should be kept as low as possible, close to the body with the knees bent.
- To lift the load, grip firmly and lift with the legs, keeping the back as straight as possible.

## RA HEALTH AND SAFETY PLAN

- A worker should not carry a load that he or she cannot see around or over.
- When putting an object down, the stance and position are identical to that for lifting; the legs are bent at the knees, and the back is straight as the object is lowered.

### 4.19 POLYCHLORINATED BIPHENYLS (PCBS)

#### Exposure Limits

The OSHA permissible exposure limit (PEL) is a time-weighted average (TWA) airborne concentration of 1,000 micrograms per cubic meter ( $\mu\text{g}/\text{m}^3$ ) for PCBs containing 42% chlorine (average molecular formula of  $\text{C}_{12}\text{H}_7\text{Cl}_3$ ). The standard encompasses all physical forms of these compounds: aerosols, vapor, mist, sprays, and PCB-laden dust particles. The standard is based on an eight-hour work day, five days per week, with no weekend exposure. Contractors working more than a 40-hour work week are required to adjust the exposure level to match actual exposure hours.

Additionally, community exposure limits have been established in the Quality of Life Performance Standards (QoLPS). Work activities such as sediment handling and processing may result in PCB-related impacts to air quality of the general public. The QoLPS for air quality includes standards and “concern levels” (at 80% of the standard levels) for total PCB concentrations in air during the remedial action. There are separate concern levels and standards for residential and commercial/industrial areas. They are:

- For residential areas, a concern level of  $0.08 \mu\text{g}/\text{m}^3$  and a standard of  $0.11 \mu\text{g}/\text{m}^3$ , both as 24-hour average PCB concentrations; and
- For commercial/industrial areas, a concern level of  $0.21 \mu\text{g}/\text{m}^3$  and a standard of  $0.26 \mu\text{g}/\text{m}^3$ , both as 24-hour average PCB concentrations.

Contractors are required to maintain general public emission levels at or below the concern level.

### 4.20 DRILLING OPERATIONS

Incidents using drilling equipment (i.e. barge-based or Geoprobe<sup>®</sup>) occur as a result of failing to adequately secure or position the drilling rig. Tools and equipment, such as elevators, cat lines, and wire rope, have the potential for striking, pinning, or cutting personnel. Geoprobe<sup>®</sup> equipment is hydraulically powered, and uses static force and dynamic percussion force to advance small-diameter sampling tools. The presence of overhead utilities and underground obstacles poses a hazard if boring equipment contacts them. As the hazards are similar to those encountered when using a conventional drill rig, the required control procedures are the same as a conventional rig and are included in the following sections.

## RA HEALTH AND SAFETY PLAN

- *Wire Rope* - Worn or frayed wire rope presents a laceration hazard if loose wires protrude from the main bundle.
- *Cat Lines* - Cat lines are used on drilling rigs to hoist material. Accidents that occur during cat line operations may injure the employee doing the rigging, as well as injure the operator. Minimal hoisting control causes sudden and erratic load movements, which may result in hand and foot injuries.
- *Working Surfaces* - Slippery work surfaces can increase the likelihood of back injuries, overexertion injuries, slips, and falls.
- *Materials Handling* - The most common type of accident that occurs in material handling operations is the “caught between” situation when a load is being handled and a finger or toe gets caught between two objects. Rolling stock can shift and/or fall from a pipe rack or truck bed.

### Control Measures

All drillers must possess required state or local licenses to perform such work and receive site-specific training prior to beginning work. The operator is responsible for the safe operation of drilling equipment and adherence to the requirements of the RA HASP. The driller must verify that all safety equipment is in proper condition and is properly used. The members of the drill crew must follow all instructions of the driller, wear appropriate PPE, and be aware of all hazards and control procedures. The drill crew must participate in the daily safety meetings and be aware of all emergency procedures.

Under no circumstances will personnel be permitted to ride the traveling block or elevators, nor will the cat line be used as a personnel carrier.

- *Pre-Drilling Protocol* - Before land-based drilling activities commence, the existence and location of underground pipe, electrical equipment, and gas lines must be determined. An underground facilities protection organization (UFPO) must be contacted at least one week, but no more than two weeks, prior to subsurface activities. Arrange for telephone, electrical, cable television, and natural gas locators to mark out lines on site prior to conducting work. Provide the electric and natural gas locators with a site figure that shows the locations where drilling activities will be completed. Conduct a site walk with the locators to visually identify each location where drilling activities are to be completed. The Pre-Drilling/Subsurface Checklist for Intrusive Fieldwork (see Attachment G) must be used to document that nearby utilities have been marked on the ground, and that the drilling locations have been cleared. The completed Pre-Drilling/Subsurface Checklist for Intrusive Fieldwork must be present prior to commencement of any intrusive investigation.

## RA HEALTH AND SAFETY PLAN

- *Equipment Inspection* - Each day, prior to the start of work, the drill rig and associated equipment must be inspected by the driller and/or drill crew. The following items must be inspected:
  - Vehicle or derrick condition;
  - Proper storage of equipment;
  - Condition of all wire rope and hydraulic lines;
  - Fire extinguisher; and
  - First-aid kit.
- *Drill Rig Set Up* – For land-based operations, all well sites will be inspected by the driller prior to mobilizing the rig to verify a stable surface exists. This is especially important in areas where soft, unstable terrain is common. The drill rig must be properly blocked and leveled prior to raising the derrick. The leveling jacks must not be raised until the derrick is lowered. The rig must be moved only after the derrick has been lowered. When the ground surface is soft or otherwise unstable, wooden blocks, at least 24 inches by 24 inches and 4 inches to 8 inches thick, must be placed between the jack swivels and the ground. The emergency brake must be engaged, and the wheels that are on the ground must be chocked. For river-based operations, the drill rig must be properly secured to the barge.
- *Overhead Electrical Clearances* - If drilling activities are conducted in the vicinity of overhead power lines, the power to the lines must be de-energized, tested de-energized, or marked up/guaranteed, or the equipment must be positioned such that no part, including derrick can come within the minimum clearances as outlined in the table below:

**Minimum Clearances**

<b>Nominal System Voltage</b>	<b>Minimum Required Clearance</b>
0-50kV	10 feet
51-100kV	12 feet
101-200kV	15 feet
201-300kV	20 feet
301-500kV	25 feet
501-750kV	35 feet
751-1,000kV	45 feet

## RA HEALTH AND SAFETY PLAN

When the drill rig is in transit, with the derrick lowered and have no load, the equipment clearance must be at least 4 feet for voltages less than 50kV, 10 feet for voltages of 50kV to 345kV, and 16 feet for voltages above 345kV.

- *Hoisting Operations* - Drillers should never engage the rotary clutch without watching the rotary table, and confirming that it is clear of personnel and equipment. Other safety procedures concerning hoisting operations include:
  - Unless the draw works is equipped with an automatic feed control, the brake should not be left unattended without first being tied down.
  - Auger strings or casing should be picked up slowly.
  - During instances of unusual loading of the derrick or mast, such as when making an unusually hard pull, only the driller should be on the rig floor; no one else should be on the rig or derrick.
  - The brakes on the draw works of the drill rig should be tested by the driller each day. The brakes should be thoroughly inspected by a competent individual each week.
  - A hoisting line with a load imposed should not be permitted to be in direct contact with any derrick member or stationary equipment, unless it has been specifically designed for line contact.
  - Workers should never stand near the borehole whenever any wire line device is being run.
  - Hoisting control stations should be kept clean and controls labeled as to their functions.
- *Cat Line Operations* - Only experienced workers will be allowed to operate the cathead controls. The kill switch must be clearly labeled and operational prior to operation of the cat line. The cathead area must be kept free of obstructions and entanglements.

The operator should not use more wraps than necessary to pick up the load. More than one layer of wrapping is not permitted.

Personnel should not stand near, step over, or go under a cable or cat line that is under tension.

- Employees or subcontractors rigging loads on cat lines must:
  - Keep out from under the load;
  - Keep fingers and feet where they will not be crushed;
  - Be sure to signal clearly when the load is being picked up;

## RA HEALTH AND SAFETY PLAN

- Use standard visual signals only and not depend on shouting to co-workers for communication; and
- Make sure the load is properly rigged, since a sudden jerk in the cat line will shift or drop the load.
- *Wire Rope* - When two wires are broken or rust or corrosion is found adjacent to a socket or end fitting, the wire rope must be removed from service or resocketed. Special attention must be given to the inspection of end fittings on boom support, pendants, and guy ropes. Other safety procedures when using wire rope include:
  - Wire rope removed from service due to defects must be cut up or plainly marked as being unfit for further use as rigging.
  - Wire rope clips attached with U-bolts must have the U-bolts on the dead or short end of the rope (i.e. “never saddle a dead horse”); the clip nuts must be re-tightened immediately after initial load carrying use and at frequent intervals thereafter.
  - When a wedge socket fastening is used, the dead or short end of the wire rope must have a clip attached to it or looped back and secured to it by a clip; the clip must not be attached directly to the live end.
  - Protruding ends of strands in splices on slings and bridles must be covered or blunted.
  - Except for eye splices in the ends of wires and for endless wire rope slings, wire rope used in hoisting, lowering, or pulling loads, must consist of one continuous piece without knot or splice.
  - An eye splice made in any wire rope must have not less than five full tucks.
  - Wire rope must not be secured by knots. Wire rope clips must not be used to splice rope.
  - Eyes in wire rope bridles, slings, or bull wires must not be formed by wire clips or knots.
- *Auger Handling* - Auger sections must be transported by cart or carried by two persons. Individuals should not carry auger sections without assistance. Other safety precautions when handling augers include:
  - Workers should not be permitted on top of the load during loading, unloading, or transferring of rolling stock.
  - When equipment is being hoisted, personnel should not stand where the bottom end of the equipment could whip and strike them.

# RA HEALTH AND SAFETY PLAN

- Augers stored in racks, on catwalks, flatbed trucks or barges should be secured to prevent rolling.

## 4.21 ELECTROFISHING

The use of electrofishing equipment involves potential hazards related to the high voltage output. Because water is an excellent conductor of electricity, the operator of the electrofishing equipment must observe certain precautions to avoid injury.

The electrofisher operates by sending current through the cathode, through the water, and to the anode. The equipment operator must become part of the circuit to be shocked. Touching the cathode and anode simultaneously would complete the circuit and result in a severe electric shock. Operators are not permitted to touch the electrodes.

Symptoms of electric shock range from muscle contraction (unable to let go), potential lung paralysis, ventricular fibrillation, heart paralysis, severe burns, and death.

### Control Measures

The following general safety procedures apply to all types of electrofishers, and should be observed at all times.

- Use electrical lineman gloves of at least 1,000-volt rating. If the gloves become very wet inside, stop electrofishing and dry them thoroughly.
- Remove wristwatch, rings, and other metal jewelry that is not protected by an insulated material.
- Use only dip nets with insulated or non-conductive handles.
- Make all electrical connections before turning on the power.
- Be sure that all personnel are aware that electrofishing is going to begin and that they are clear of electrodes before turning on the power.
- Be sure that no animals (i.e., livestock, dogs, etc.) are in the water near the sampling locations.
- The equipment must include a switch that keeps the circuit open unless actively and continuously closed. The operator also will have access to an emergency shut-off switch.
- Operate the equipment within acceptable power ranges to prevent overloading the equipment and minimize the potential of fire hazard.
- During electrofishing, the high voltage flashing light and/or audible tone generator should be working.

## RA HEALTH AND SAFETY PLAN

- Do not touch people, equipment, or metal objects with the anode or cathode probes/surfaces.
- Wear polarized sunglasses to detect sub-surface hazards and obstacles.
- Turn the power off immediately if a problem occurs and also when the unit is not in use.

### **Additional Control Measures for Backpack Electrofishers**

The following safety procedures, including the previously listed general procedures, should be followed at all times when using backpack electrofishers.

- Use water-tight wading hip boots or chest waders. If the waders or boots become wet inside, stop electrofishing and dry them thoroughly.
- Operate slowly and carefully to prevent tripping on objects in the stream.
- Sampling must cease if persons, pets, or livestock are observed in the water or on shore within 12 meters of the electrofishing unit.
- To prevent overloading the unit, do not touch the cathode with the anode.
- Check that the mercury tilt switch shuts off the power when the unit is tipped more than 45° from vertical.
- Backpack electrofishers add a burden to the user, requiring careful body positioning to avoid back strain.

### **4.22 WORKING ON A BRIDGE**

Whenever possible, sampling will be performed from a boat. If sampling from a bridge is required, roadway traffic avoidance will be accomplished by following these procedures:

- Check with the local traffic control department (police/public works) to determine if a stationed uniformed police officer is necessary;
- If possible, schedule work for off-peak traffic hours;
- Personnel must utilize PPE, including an orange traffic safety vest, safety cones, and “men working” signs;
- If a sidewalk is not present, then personnel must park the vehicle on the shoulder of the road with the emergency flashers on; the shoulder must be at least 6 feet wide and the wheels of the vehicle must not extend over the white lines on the roadway. Additionally, all personnel must conduct work on the opposite side of the vehicle from oncoming traffic (i.e., personnel are protected by the vehicle); and

## RA HEALTH AND SAFETY PLAN

- Work will only be conducted during daylight at bridge locations without sidewalks, and will not be conducted if slippery road conditions exist or if snow plows could potentially be in operation.

River traffic avoidance will be accomplished by following these procedures:

- During the navigation season, an easily visible floating buoy (i.e. orange) will be attached to the cable used to suspend all equipment from the bridge. This buoy will be attached using a sliding harness, allowing the buoy to float at the surface while the sampler is submerged.
- Prior to lowering any equipment, a visual observation will be performed to confirm the lack of boat traffic in the vicinity of the bridge.

Water safety and fall protection will be accomplished by following these procedures:

- All personnel must wear a USCG-approved PFD whenever working on or near the water, except when adequate fall protection exists on bridges (42" high top rail and mid-rail).
- Work must be conducted so that both feet of the personnel are on the base of the bridge, shoulder of the road, or sidewalk (i.e., not standing on the railing) with the center of gravity lower than the bridge railing. Additionally, a personal fall arrest system must be used if there is no guardrail at least 42 inches high.
- A functioning cellular phone must be present at the site at all times.

# RA HEALTH AND SAFETY PLAN

## SECTION 5

### PERSONAL PROTECTIVE EQUIPMENT

#### 5.1 LEVELS OF PROTECTION

PPE is required to safeguard project personnel from various hazards. Varying levels of protection may be required depending on the degree of physical hazard and the potential for exposure to PCB contaminated sediment.

PPE shall be worn at all times on the site, including travel within the site when starting or ending shifts.

- Hard hats are required at all times in the work area areas (i.e., construction, processing/operations, dredging, wharf, marine vessels). The following color code system for hard hats shall be implemented: White hard hats shall be worn by all GE, CM, Engineer of Record, and contractor personnel. Yellow hard hats shall be worn by all visitors. Red hard hats shall be worn by any personnel (except safety) with CPR/first aid certification. Green hard hats shall be worn by all safety personnel. Blue hard hats shall be worn by any new employee for the first 30 days. Cowboy hard hats are not permitted. Hard hats must be worn in the forward direction, unless the hard hat has a swivel suspension and is American National Standards Institute (ANSI) approved to be worn in the reverse direction.
- Appropriate eye and face protection that complies with ANSI Z87 shall be worn at all times. Safety glasses with side shields are required as a minimum.
- Sensible and safe work clothing/shoes must be worn. This means the wearing of shirts with a minimum four-inch sleeve. Shorts, cutoffs, sleeveless shirts, tank tops, sneakers, and running shoes are strictly prohibited.
- No canvas or leather sneakers (even if equipped with steel toe) or sandals will be worn. All construction boots or shoes designed to accommodate laces must be fully laced.
- Appropriate hearing protection shall be worn in work areas where levels exceed established standards.
- Suitable gloves must be worn to protect the hands from injury as appropriate for the work to be performed.
- Approved respirators must be used when excessive dust, mist, fumes, gases, or other atmospheric impurities are present.
- Self inflating PFDs will not be allowed on the project.

# RA HEALTH AND SAFETY PLAN

- Full-body safety harnesses and secured safety lanyards or retractable lifelines must be used when working from unguarded work surfaces where falls greater than six feet present a hazard. (NOTE: Site requirements may limit this potential fall length to four feet). Lanyards or retractable lifelines must be secured to separate lifelines and independent connection points capable of withstanding the load of a potential fall.
- Proper personal protective equipment must be worn for welding and burning. Welding screens must be used when welding operations are in the vicinity of other employees.
- Electric insulating protective equipment, such as rubber gloves, blankets, hoses, boots, etc. shall be inspected before use.

In accordance with Section 5 in the contractor HASP, a hazard/risk/exposure assessment will be provided for each major activity that will take place. Section 6 of the contractor HASP provides the JSA for each major activity, which identifies the steps, hazards, and control measures for each task. The required PPE is listed on each JSA, either in the main header as minimum required PPE and under control measures for task specific PPE (e.g., goggles).

## 5.2 LEVEL D PROTECTION

The minimum level of protection that will be required of project personnel will be Level D, which will be worn when site activities present no potential for dermal contact with contaminated media, and no potential for inhalation exposure exists. The following equipment will be used for Level D:

- Work clothing as prescribed by weather conditions;
- Leather safety-toe shoes or boots, meeting ANSI Z41;
- Safety glasses with permanent side shields or goggles, meeting ANSI Z87;
- USCG-approved Commercial Type I, II, or III PFD when working over or near water (e.g., on a boat, barge, shoreline, dock, or bridge) and the potential for drowning exists. Each PFD shall be worn with an attachable emergency whistle and a water activated light attached to the PFD;
- Hard hat, meeting ANSI Z89, when falling object hazards are present;
- Hearing protection (if noise levels exceed 85 decibels on the a-scale (dBA), then hearing protection with a USEPA noise reduction ratio [NRR] of at least 20 dBA must be used);
- Gloves as appropriate for task (detail glove type for task in JSA); and
- Lighted reflective light-emitting diode (LED) illuminated safety vests shall be required for all personnel working near roadways, railways or moving vehicles, including heavy operating equipment, if working before dawn, after dusk or during reduced visibility

# RA HEALTH AND SAFETY PLAN

(i.e. fog, overcast skies, etc). High visibility reflective safety vests or other suitable garments approved by the CM shall be worn by all other personnel that are not working near roadways, railways, or moving vehicles.

## 5.2.1 Modified Level D Protection

Modified Level D PPE will be used when airborne particulate matter is not present at levels of concern, but site activities present an increased potential for contact with contaminated sediment. Modified Level D protection consists of Level D PPE in addition to the following:

- Nitrile gloves worn over nitrile surgical gloves;
- Latex / polyvinyl chloride (PVC) over boots when contact with contaminated sediment is anticipated;
- Tyvek<sup>®</sup> suit when body contact with contaminated sediment is anticipated; and
- Polyethylene-coated Tyvek<sup>®</sup> suit or raingear when body contact with wet sediment or liquid contaminants is anticipated.

## 5.2.2 Level C Protection

Level C protection will be required when the airborne concentration of a chemical hazard reaches one-half of the OSHA PEL or American Conference of Governmental Industrial Hygienists (ACGIH) threshold limit value (TLV). Level C protection consists of Level D PPE in addition to the following:

- Latex/PVC over boots when contact with contaminated sediment is anticipated;
- Full-face, air-purifying respirator with combination organic vapor and high-efficiency particulate air (HEPA) cartridges; and
- Tyvek<sup>®</sup> suit or polyethylene-coated Tyvek<sup>®</sup> suit, with ankles and cuffs taped to boots and gloves.

## 5.3 SELECTION OF PPE

PPE will be selected based on the potential for contact with contaminated sediment materials, site conditions, air quality, and the judgment of the PSM, SSR, or site supervisor.

## 5.4 SITE RESPIRATORY PROTECTION PROGRAM

Each contractor HASP will provide its own written respiratory protection program in compliance with 29 CFR 1910.134, which will consist of the following (as a minimum):

- All on-site personnel who may use respiratory protection will have an assigned respirator.

# RA HEALTH AND SAFETY PLAN

- All on-site personnel who may use respiratory protection will have been fit tested and trained in the use of a full-face air-purifying respirator within the past 12 months.
- All on-site personnel who may use respiratory protection must, within the past year, have been medically certified as being capable of wearing a respirator. Documentation of the medical certification must be provided to the PSM prior to commencement of site work.
- Respirators must be properly cleaned, maintained, stored, and National Institute for Occupational Safety and Health (NIOSH) approved.
- If air-purifying cartridge respirators are used, a calculation must be completed to determine the end of service life for the cartridge and establish a cartridge change-out schedule. Using breakthrough or changing cartridges at the end of each shift is not acceptable.
- All on-site personnel who may use respiratory protection must be clean-shaven. Mustaches and sideburns are permitted, but they must not touch the sealing surface of the respirator.
- Respirators will be inspected, and a negative pressure test performed prior to each use.
- After each use, the respirator will be wiped with a disinfectant, cleansing wipe. When used, the respirator will be thoroughly cleaned at the end of the work shift. The respirator will be stored in a clean plastic bag, away from direct sunlight in a clean, dry location, in a manner that will not distort the face piece.

## 5.5 USING PPE

Depending on the level of protection selected, specific donning and doffing procedures may be required. The procedures presented in this section are mandatory if Modified Level D or Level C PPE is used.

### 5.5.1 Donning Procedures

Use the following procedures when donning PPE:

- Remove bulky outerwear, remove street clothes, and store in clean location.
- Put on work clothes or coveralls.
- Put on the required chemical protective coveralls.
- Put on the required chemical protective boots or boot covers.
- Tape the legs of the coveralls to the boots with duct tape.
- Put on the required chemical protective gloves.
- Tape the wrists of the protective coveralls to the gloves.

## RA HEALTH AND SAFETY PLAN

- Don the required respirator and perform appropriate fit check (Level C).
- Put hood or head covering over head and respirator straps and tape hood to face piece (Level C).
- Don remaining PPE, such as safety glasses or goggles and hard hat.

### 5.5.2 Doffing Procedures

Whenever a person leaves the exclusion zone (EZ) of a particular work area, the following decontamination sequence must be followed:

- Rinse contaminated materials from the boots or remove contaminated boot covers.
- Clean reusable protective equipment.
- Remove protective garments, equipment, and respirator (Level C). All disposable clothing should be placed in plastic bags, which are labeled with contaminated waste labels.
- Wash hands, face, and neck (or shower if necessary).
- Proceed to clean area and dress in clean clothing.
- Clean and disinfect respirator for next use.

All disposable equipment, garments, and PPE must be bagged in plastic bags and labeled for disposal. See Section 9, Decontamination, for detailed information on decontamination stations.

### 5.5.3 Selection Matrix

The level of PPE selected will be based on air monitoring of the work environment and an assessment of the potential for skin contact with contaminated media. The PPE selection matrix is presented in Table 3 below.

**Table 3 – PPE Selection Matrix**

<b>Task</b>	<b>Anticipated Level of PPE for Task Initiation</b>
Facility Site Work Construction	Level D
Rail Yard Construction	Level D
Rail Yard Operations	Modified Level D
Processing Facility Construction	Level D
Processing Facility Operations	Modified Level D
Dredging Operations	Modified Level D
Habitat Construction	Modified Level D
Support Activities	Modified Level D
Decontamination/Equipment Cleaning Activities	Modified Level D

Note: Please refer to the *Diving Safety Manual* (Appendix C) for a description of scuba equipment to be used.

# RA HEALTH AND SAFETY PLAN

## SECTION 6

### AIR MONITORING AND ACTION LEVELS

#### 6.1 AIR MONITORING

Assessment and evaluation of field personnel exposures to airborne contaminants through real-time and integrated monitoring shall be performed by each contractor as per the contractor HASP, concurrent with activities which may possibly generate airborne contaminants approaching established exposure limits (PEL, ACGIH TLV, NIOSH TWA). PCBs are the primary contaminant of concern on the project; however, other contaminants (e.g., metals) may be encountered in the course of river dredging. The sediment coring program has also identified metals (Cr, Cd, As, Hg) from an upstream pigment plant. Therefore, the contractor must review all sediment data and address any appropriate controls in the development of the contractor HASP. The contractor HASP and air monitoring plan may have to be reevaluated should other discoveries be made. A discussion of potential air contaminants is presented in the following sections.

#### 6.2 POLYCHLORINATED BIPHENYLS

PCBs have very high boiling points and exhibit low volatility. Site work will take place outdoors or indoors with adequate ventilation. There is very little potential for PCB vapor generation above the PEL, and very little potential for airborne particulate generation during project activities, as PCBs have a strong affinity for sediment and the sediment will be wet. If airborne particulates (e.g., dust) are generated during the dewatering process or transferring of coarse material to the staging area, dust suppression measures will be implemented by the contractor. Contractors will be required to closely monitor emission levels as community level exposure limits are much lower than employee limits. The contractor is responsible for maintaining community level exposure at or below the QoLPS limits.

#### 6.3 AIRBORNE PARTICULATES (DUST)

Real-time aerosol monitors will be used by contractors to monitor the level of airborne particulates. Perimeter, point source, and personnel air monitoring will also be required.

#### 6.4 GASOLINE AND SOLVENTS

Standard safety procedures will be followed when handling gasoline and solvents to minimize vapor generation and inhalation exposure. Safety containers will be capped and stored outside in a manner that provides adequate ventilation and minimizes the risks of release, fire, or explosion. Potential exposures are of very short duration.

# RA HEALTH AND SAFETY PLAN

## 6.5 HYDROGEN SULFIDE

Dredging in areas of heavy organic sediments may release hydrogen sulfide. The dredging contractor will be required to monitor hydrogen sulfide and combustible gasses with a combustible gas indicator with a hydrogen sulfide detector. Action levels for hydrogen sulfide will be established as per Section 6.7. Contractors will be required to closely monitor emission levels as community level exposure limits are much lower than employee limits. The contractor is responsible for maintaining community level exposure at or below the QoLPS limits.

## 6.6 RESPIRATORY HAZARD ASSESSMENT

The PSM will perform a respiratory hazard assessment, which will include a review of each contractor HASP and corresponding JSA.

## 6.7 ACTION LEVELS

When real-time air monitoring cannot be performed for all potential chemicals of concern, theoretical exposure limits based on a worst-case scenario shall be calculated using dust as an action level, which cannot exceed 1.0 milligram per square meter ( $\text{mg}/\text{m}^3$ ). Action levels may be adjusted based on the data obtained over the duration of the project.

When determining whether employees are approaching established exposure limits, exposures and corresponding PEL must be calculated based on the number of hours worked (i.e., 12 hours versus the traditional eight-hour PEL, TLV, or TWA).

When there is a difference between one or more published exposure limits for a chemical of concern (e.g., OSHA PEL and ACGIH TLV), the more conservative exposure limit will be used for determining an action level.

# RA HEALTH AND SAFETY PLAN

## SECTION 7

### MEDICAL MONITORING

#### 7.1 MEDICAL SURVEILLANCE PROGRAM

All project personnel who work in areas that may result in the exposure to chemicals at or above the PEL, are members of a hazmat team or who wear a respirator for more than 30 days per year shall participate in a medical surveillance program in compliance with 29 CFR 1910.120(f). Copies of the documentation required as part of 29 CFR 1910.120(f) shall be provided by each contractor to the PSM.

##### 7.1.1 Pre-Placement Medical Examination

All project personnel operating motor vehicles or heavy equipment associated with the project, including dredge cranes and operating vehicles off-site for project purposes, shall pass a functional capacity examination (FCE) prior to starting work that shall include:

- 20/20 vision to perceive or recognize distances, depths, and peripheries;
- Audiogram results indicating the ability to hear audible instructions via two-way radio;
- Ability to move the head and neck sideways for increased peripheral vision; and
- Ability to ascend/descend fixed ladders and stairs.

All on-site personnel involved with lifting, carrying, pushing, or pulling equipment and materials that weigh up to 40 pounds shall have an FCE to confirm they are physically fit to perform their job.

All on-site personnel involved with dredging, processing, and handling PCB-impacted sediments shall have a baseline, annual and exit examinations in compliance with 29 CFR 1910.120(f) to identify any pre- or post-exposure medical conditions.

The examining physician shall provide the employee with a letter summarizing his findings and recommendations, confirming the worker's fitness for work and ability to wear a respirator.

#### 7.2 OTHER MEDICAL EXAMINATIONS

Each diver must be certified by a licensed physician to be medically qualified for their assignment before diving. The medical examination must be documented and a written report prepared by the examining physician. The medical examination must contain the examining physician's opinion of the individual's fitness to dive, including any recommended restrictions or limitations. The report must be reviewed by the DSO

## **RA HEALTH AND SAFETY PLAN**

In addition to pre-employment, annual, and exit physicals, personnel may be examined:

- At employee request after known or suspected exposure to toxic or hazardous materials and
- At the discretion of the PSM, SSR, or occupational physician in anticipation of or after known or suspected exposure to toxic or hazardous materials.

### **7.3 MEDICAL RESTRICTION**

When the examining physician identifies a need to restrict work activity, the employee's supervisor must communicate the restriction to the employee and the site supervisor, who will communicate the information to the PSM. The terms of the restriction will be discussed with the employee and the supervisor.

Alternate, light-duty work will be made available to personnel whenever possible.

# RA HEALTH AND SAFETY PLAN

## SECTION 8

### PERSONNEL TRAINING

#### 8.1 GENERAL

Below is a table that details all of the different training requirements for on site personnel.

Personnel / Type of Training	Project Orientation	Behavior -based Safety	HAZWOPER 40-hr	Zero Incident	CPR/ First Aid	OSHA 10-hr	Defensive Driving	Controlled Substance / Alcohol Abuse Awareness
Visitors (including regulatory personnel)	Yes	No	No (must be escorted by HAZWOPER trained personnel)	No	No	No	No	No
GE Site Project Personnel	Yes	Yes	Yes (for Processing, Dredging and Habitat Const.)	Yes	No	No	No	No
CM Site Project Personnel	Yes	Yes	Yes (for Processing, Dredging and Habitat Const.)	Yes	Yes (for Safety personnel)	Yes (for Safety personnel)	Yes (if driving for business)	Yes
Contractor Managers, Supervisors and Safety Personnel	Yes	Yes	Yes (for Processing, Dredging and Habitat Const.)	Yes	Yes	Yes	Yes (if driving for business)	Yes (biannually)
Contractor Field/Craft	Yes	Yes	Yes (for Processing, Dredging and Habitat Const.) see note 1 below	No	Yes (for SSR)	Yes (for SSR)	Yes (if driving for business)	No

Note 1: Contractor and subcontractor field personnel who work in areas that may result in exposure to hazardous substances or health hazards must be trained in compliance with 29 CFR 1910.120 (HAZWOPER).

All project personnel shall attend a site-specific project safety orientation upon hire that will review the Zero Incident management approach; the project team's proactive approach to manage the interrelated areas of safety, health, environment, and risk management; and the project goal of zero accidents and zero injuries with work tasks designed to minimize or eliminate hazards to personnel, process, equipment, environment, and the general public. In addition, it will be reinforced that no individuals shall perform tasks that may endanger their own safety and health or that of others. In other words, all individuals are empowered to have "stop

# RA HEALTH AND SAFETY PLAN

work authority”. Visitors will also be required to receive an abbreviated project safety orientation.

The site-specific project safety orientation for all project personnel will also discuss behavior-based safety, the benefits of behavior-based safety, and how to conduct a worker safety observation and participate in a feedback session to identify positive and questionable behaviors.

All on-site personnel will receive training on the effects and consequences of controlled substance use on personal health, safety, and work environment.

All project personnel that drive any type of vehicle on or off the site for any purpose related to the project (other than driving to and from a place of residence for work) shall complete a full day (eight hours) hands-on defensive driving course and provide documentation.

All on-site personnel who work in areas that may result in the exposure to hazardous substances or health hazards must be trained in compliance with 29 CFR 1910.120 (HAZWOPER standard). Certification must be renewed on an annual basis by completing an eight-hour refresher.

## 8.2 40-HOUR OSHA HAZWOPER COURSE

The following is a list of the topics typically covered in the 40-hour HAZWOPER training:

- General safety procedures;
- Physical hazards (fall protection, noise, heat stress, cold stress);
- Names and job descriptions of key personnel responsible for site health and safety;
- Safety, health, and other hazards typically present at hazardous waste sites;
- Use, application, and limitations of PPE;
- Work practices by which project personnel can minimize risks from hazards;
- Safe use of engineering controls and equipment on site;
- Medical surveillance requirements;
- Recognition of symptoms and signs that might indicate overexposure to chemicals;
- Worker right-to-know (Hazard Communication, 29 CFR 1910.1200);
- Routes of exposure for chemicals of concern;
- Engineering controls and safe work practices;
- Components of a health and safety program and a site-specific HASP;
- Decontamination practices for personnel and equipment;

# RA HEALTH AND SAFETY PLAN

- Confined-space entry procedures; and
- General emergency response procedures.

## 8.3 SUPERVISOR TRAINING

Management and supervisors must complete the following courses:

- Eight-hour HAZWOPER supervisor;
- Thirty-hour OSHA construction safety course;
- START – behavior-based safety training;
- Controlled substance and alcohol awareness training on the manifestations and behavioral causes that may indicate controlled substance and alcohol use or abuse (required on at least a biannual basis); and
- CPR/first aid.

## 8.4 SITE-SPECIFIC TRAINING

A project orientation session covering site hazards, procedures, and all contents of the approved site-specific Phase 1 RA HASP must be received by all on-site personnel prior to commencement of work or entering the site. The orientation shall include a discussion of the chemical, physical, and biological hazards; names of personnel responsible for site safety and health; proper use of personal protective equipment; work practices to minimize risk from hazards; safe use of engineering controls and equipment; acute effects of compounds at the site; decontamination procedures; and emergency procedures.

### 8.4.1 Visitors

A visitor is an individual that is not permanently assigned to the project, has not received a project safety orientation or does not have the required training certifications to work on the site.

Visitors arriving on the site must be escorted at all times by the PSM, CM safety representative, or site supervisor, or must receive the site-specific project safety orientation and have the appropriate training certifications (e.g., HAZWOPER certification).

### 8.4.2 Safety “Toolbox” Meetings

Safety “toolbox” meetings discussed prior to each shift will cover the current weather and site conditions, incidents from the previous shift, safe or at-risk/questionable behaviors from the previous shift, work to be accomplished, anticipated hazards, engineering controls / work practices / PPE to protect against hazards and any additional safety topics. No work will be performed before the safety “toolbox” meeting has been held. The safety “toolbox” meeting must also be held prior to new tasks, and repeated if new hazards are encountered. Safety “toolbox” meetings shall be documented on the safety meeting sign-in sheet provided as

# RA HEALTH AND SAFETY PLAN

Attachment C, or equivalent. All project personnel arriving on site after the safety “toolbox” meeting must review the contents of the meeting and sign the sheet.

## 8.5 FIRST AID AND CPR

At least two employees current in first aid/CPR will be assigned to each work crew carrying out a specific field task and will be on the site during operations. These individuals must also receive training regarding the precautions and protective equipment necessary to protect against exposure to blood-borne pathogens.

## 8.6 BOAT OPERATORS

The operator/skipper of any boat (e.g., barge, tug, dredge, support vessel, etc.) must complete a USCG boating safety training course prior to conducting work on the river. Each operator/skipper must demonstrate proficiency in the following subject areas: proper operation of a boat; boat and safety equipment inspections; content and frequency of equipment safety inspections; proper use of on-board safety equipment, including fire extinguisher, radio or cellular phone, flares, and horn; proper procedures on the completion and filing of a float plan; appropriate boating “rules-of-the-road”; emergency procedures in the event of capsizing or being thrown overboard; and different types of PFDs and their proper inspection and use.

## 8.7 COMPETENT PERSON

Contractors are individually responsible for training their respective workers and for complying with all project requirements. Table 4 below provides some guidance on competent/qualified person, training, and JSA requirements for specific safety and health regulations.

**Table 4 Competent Person and Activity Hazards Analysis Requirements**

<b>Safety and Health Requirement</b>	<b>OSHA Regulation</b>	<b>Competent/ Qualified Person</b>	<b>Training Required</b>	<b>Written Plan and JSA Required</b>
General Safety and Health	1926.20	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>
Safety Training	1926.21	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>
Confined Spaces	1926.21, 1910.147	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>
Confined Space Permit System	See above	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>
First Aid and Medical	1926.23, 50	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>
Fire Protection and prevention	1926.24, 150-155, 352	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>
Housekeeping	1926.25	<i>N/A</i>	<i>N/A</i>	<i>N/A</i>

# RA HEALTH AND SAFETY PLAN

**Table 4 (Continued)**  
**Competent Person and Activity Hazards Analysis Requirements**

<b>Safety and Health Requirement</b>	<b>OSHA Regulation</b>	<b>Competent/ Qualified Person</b>	<b>Training Required</b>	<b>Written Plan and JSA Required</b>
Illumination	1926.26, 56	<i>Recommended</i>	<i>N/A</i>	<i>N/A</i>
Sanitation	1926.27, 51	<i>N/A</i>	<i>N/A</i>	<i>N/A</i>
Personal Protective Equipment	1926.28, 95-98, 100-107	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>
Acceptable Certifications	1926.29	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>
Incorporation by Reference	1926.31	<i>N/A</i>	<i>N/A</i>	<i>N/A</i>
Emergency Employee Action Plans	1926.35	<i>Recommended</i>	<i>Yes</i>	<i>Yes</i>
Noise Exposure	1926.52	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>
Radiation Protection	1926.53, 54	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>
Gases, Vapors, Dusts, and Mists	1926.1926.55	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>
Ventilation	1926.57, 353	<i>Recommended</i>	<i>Yes</i>	<i>Yes</i>
Hazard Communication	1926.59	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>
Process Safety Management	1926.64 1910.119	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>
Hazardous Waste Operations and Emergency Response	1926.65 1910.120	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>
Accident Prevention Signs and Tags	1926.200	<i>N/A</i>	<i>N/A</i>	<i>N/A</i>
Signaling	1926.201	<i>Recommended</i>	<i>N/A</i>	<i>Yes</i>
Barricades	1926.202	<i>N/A</i>	<i>N/A</i>	<i>N/A</i>
Material Storage	1926.250	<i>N/A</i>	<i>Yes</i>	<i>Yes</i>
Rigging	1926.251	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>
Waste Disposal	1926.252	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>
Tools	1926.300-307	<i>N/A</i>	<i>N/A</i>	<i>Yes</i>
Gas Welding and Cutting	1926.350	<i>Recommended</i>	<i>Yes</i>	<i>Yes</i>
Arc Welding	1926.351	<i>Recommended</i>	<i>Yes</i>	<i>Yes</i>
Electrical	1926.400-415	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>
General Electrical	1926.416	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>
Lockout/Tagout	1926.417, 1910.147	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>
Lockout/Tagout Permit System	See above	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>
Maintenance of Electrical Equipment	1926.431	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>

# RA HEALTH AND SAFETY PLAN

**Table 4 (Continued)**  
**Competent Person and Activity Hazards Analysis Requirements**

<b>Safety and Health Requirement</b>	<b>OSHA Regulation</b>	<b>Competent/ Qualified Person</b>	<b>Training Required</b>	<b>Written Plan and JSA Required</b>
Environmental Deterioration of Electrical Equipment	1926.432	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>
Batteries/Battery Charging Equipment	1926.441	<i>N/A</i>	<i>Yes</i>	<i>Yes</i>
Scaffolding	1926.450-454	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>
Aerial Lifts	1926.453	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>
Fall Protection	1926.500-503	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>
Cranes, Derricks, Hoists, Elevators, and Conveyors	1926.550	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>
Motor Vehicles, Mechanized Equipment	1926.600-603	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>
Powered Industrial Trucks (forklifts)	1910.178	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>
Site Clearing	1926.604	<i>N/A</i>	<i>Yes</i>	<i>Yes</i>
Marine Operations and Equipment	1926.606	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>
Excavations	1926.650-652	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>
Excavation Permit	<i>N/A</i>	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>
Concrete and Masonry Construction	1926.700-706	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>
Steel Erection	1926.750-761 and SENRAC	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>
Underground Construction	1926.800	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>
Caissons	1926.801	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>
Cofferdams	1926.802	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>
Compressed Air	1926.803	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>
Demolition	1926.850-860 inclusive	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>
Power Transmission and Distribution	1926.950-960 inclusive	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>
Rollover Protective Structures; Overhead Protection	1926.1000-1003 inclusive	<i>N/A</i>	<i>N/A</i>	<i>Yes</i>
Stairways and Ladders Scope	1926.1050	<i>N/A</i>	<i>Yes</i>	<i>Yes</i>
S/L General Requirements	1926.1051	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>
Stairways	1926.1052	<i>Recommended</i>	<i>Yes</i>	<i>N/A</i>
Ladders	1926.1053	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>

# RA HEALTH AND SAFETY PLAN

**Table 4 (Continued)**  
**Competent Person and Activity Hazards Analysis Requirements**

<b>Safety and Health Requirement</b>	<b>OSHA Regulation</b>	<b>Competent/ Qualified Person</b>	<b>Training Required</b>	<b>Written Plan and JSA Required</b>
Ladder/Stair Training	1926.1060	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>
Diving Scope	1926.1071-1072	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>
Dive Team Quals	1926.1076	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>
Dive Safe Practices Manual	1926.1080	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>
Pre-dive Procedures	1926.1081	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>
Procedures During Dive	1926.1082	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>
Post Dive Procedures	1926.1083	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>
SCUBA Diving	1926.1084	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>
Surface-Supplied Air Diving	1926.1085	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>
Mixed-gas Diving	1926.1086	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>
Liveboating	1926.1087	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>
Diving Equipment	1926.1090	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>
Diving Recordkeeping Requirements	1926.1092	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>
Internal Traffic Control	N/A	<i>N/A</i>	<i>Yes</i>	<i>Yes</i>
Traffic Movement Restriction Times	N/A	<i>N/A</i>	<i>Yes</i>	<i>Yes</i>
Line Breaking	1910.119 and 1926.54	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>
Major Material Movements	N/A	<i>N/A</i>	<i>Yes</i>	<i>Yes</i>
Right-of-way Restrictions	N/A	<i>N/A</i>	<i>Yes</i>	<i>Yes</i>

# RA HEALTH AND SAFETY PLAN

## SECTION 9

### DECONTAMINATION

#### 9.1 CONTAMINATION CONTROL ZONES

Contamination control zones must be defined and maintained in each potentially contaminated work area to prevent the spread of contamination and to prevent unauthorized people from entering potentially hazardous areas.

##### 9.1.1 Exclusion Zone

An EZ may consist of a specific work area, or may be an entire area of potential contamination. All personnel entering an EZ must use the required PPE, and must have the appropriate training and medical clearance. The EZ is the defined area where there is a possible respiratory and/or contact health hazard. Cones, caution tape, or a site diagram may be used to identify the location of each EZ.

##### 9.1.2 Contamination Reduction Zone

A CRZ or transition area will be established as needed to perform decontamination of personnel and equipment. All personnel entering or leaving the EZ will pass through this area to prevent any cross-contamination. Tools, equipment, and machinery will be decontaminated in a specific location. The decontamination of all personnel will be performed on site adjacent to the EZ. Personal protective outer garments and respiratory protection will be removed in the CRZ and prepared for cleaning or disposal. This zone is the only appropriate corridor between the EZ and the SZ.

##### 9.1.3 Support Zone

The SZ is a clean area outside the CRZ to prevent employee exposure to hazardous substances. Eating and drinking will be permitted in the SZ only after proper decontamination. Smoking may be permitted in designated areas of the SZ, subject to site requirements.

#### 9.2 PERSONNEL DECONTAMINATION

All personnel wearing Modified Level D or Level C PPE in an exclusion zone must undergo decontamination prior to entering a SZ in compliance with 29 CFR 1910.120(k). The personnel decontamination area will consist of the following stations at a minimum:

- *Station 1:* Personnel leaving the contaminated zone will remove the gross contamination from their outer clothing and boots.

## **RA HEALTH AND SAFETY PLAN**

- *Station 2:* Personnel will remove their outer garment and gloves and dispose of them in properly labeled containers. Personnel will then decontaminate their hard hats and boots with an aqueous solution of detergent or other appropriate cleaning solution. These items will then be hand carried to the next station.
- *Station 3:* Personnel will thoroughly wash their hands and face before leaving the CRZ. Respirators will be sanitized and then placed in a clean plastic bag.

Personnel working on marine equipment shall decontaminate prior to accessing a support vessel for transportation to the support marina. Personnel shall wash hands, face, and other exposed skin areas prior to work breaks and eating.

No work clothing, shoes, or boots that have come into contact with contaminated sediment shall be worn or carried out of the project area unless they have been decontaminated.

### **9.3 EQUIPMENT DECONTAMINATION**

All vehicles and equipment that have entered a potentially contaminated area will be visually inspected and, if necessary, decontaminated prior to leaving the area. If the visible level of vehicle contamination is low, decontamination may be limited to rinsing tires and wheel wells with water. If the vehicle has visible gross contamination, steam cleaning or pressure washing may be required. Rinsate from all decontamination activities will be collected or contained for proper treatment and/or disposal.

All barges and associated marine equipment shall be decontaminated of any visible sediment before being sent to the working wharf for repairs and/or maintenance.

For additional specific procedures and requirements applicable to equipment decontamination refer to RAWP #3 and applicable appendices.

#### **9.3.1 PPE Decontamination**

Where and whenever possible, single-use, external protective clothing must be used for work within the EZ or CRZ. This protective clothing must be disposed of in properly labeled containers. Reusable protective clothing will be rinsed at the site with detergent and water. The rinsate will be collected or contained for proper treatment and/or disposal.

When removed from the CRZ, the respirator will be thoroughly cleaned with soap and water. The respirator face piece, straps, valves, and covers must be thoroughly cleaned at the end of each work shift and ready for use prior to the next shift. Respirator parts may be disinfected with a solution of bleach and water or by using a spray disinfectant.

# RA HEALTH AND SAFETY PLAN

## SECTION 10

### EMERGENCY RESPONSE

#### 10.1 GENERAL

This section presents emergency response procedures, including specific fire and spill response protocols, along with information pertaining to medical and first aid emergencies and injury, illness, and near-miss reporting requirements.

Each work area will be evaluated for the potential for fire, explosion, chemical release, or other emergency. An evacuation route from each specific work area must be identified prior to beginning work in the area.

Unusual events, activities, chemicals, and conditions must be reported to the site supervisor immediately.

#### 10.2 EMERGENCY RESPONSE

If an incident that requires emergency response occurs, the site supervisor must take the following steps:

- Evaluate the incident and assess the need for assistance and/or evacuation;
- Call for outside assistance as needed;
- Notify the PSM and appropriate SSR of the incident;
- Notify GE and its representatives of the incident; and
- Take appropriate measures to stabilize the incident scene and ensure that the situation will not affect other areas.

Periodic drills will be conducted involving project personnel and external emergency responders. Specific drill requirements and scheduling will be identified in the pre-planning process, and drills will be held at least annually. Drills will consist of a simulated fire, medical and water-based response, as well as a table-top drill. A formal critique and discussion will be conducted for each of the drills.

##### 10.2.1 Notifications

In the event of an incident that requires emergency response, project personnel will immediately notify 911 so that the proper emergency personnel can respond. Following the 911 call, a project-specific “Priority” will be issued to project personnel over the two-way radio.

# RA HEALTH AND SAFETY PLAN

These priorities were developed with local emergency responders based on the expected capabilities of project personnel and external responders. The priorities are as follows:

- **Priority 1** — Call “911”; external response required. These include the following types of incidents:
  - traumas (either with or without exposure) - e.g., fractures, open wounds, falls from elevation;
  - life-threatening incidents (either with or without exposure) - e.g., injured individual is unconscious, severely bleeding, not breathing or has chest pains;
  - chemical releases - e.g., a visible plume or exposure causing eye or throat irritation;
  - fires - either controllable or uncontrollable; and
  - sinking or capsized boats.
- **Priority 2** - Internal response with first aid supplies to provide basic life support, including minor medical injuries (e.g., abrasions, lacerations, eye irritations, etc.).
- **Priority 3** - Internal response with spill supplies, including liquid spills within a containment system or to the ground or water.
- **Priority 4** - Internal response with support boat/marine vessel.
- **Priority 5** - Call Canadian Pacific Railway. Off-site incidents involving rail cars will be the responsibility of the rail carrier, working with local emergency responders.

The same personnel that called the “Priority” will notify the PSM, the appropriate area Safety Representative (i.e., facility construction, dredging or facility operations), and other project safety personnel. All will respond to the scene accordingly.

If needed, air horns strategically located throughout the facility and on each project vessel will initiate the evacuation signal - one long blast.

The PMS or designee will act as the incident commander for project emergencies that are handled internally. Trained on-site personnel will use fire extinguishers for small fires, and first aid/CPR-trained personnel will provide treatment for non-life threatening injuries.

In the event of an emergency requiring external emergency response, the first responding agency’s lead officer will become the incident commander after he arrives on site. The Project Safety Manager will serve as liaison to the external incident commander, as appropriate.

Appropriate emergency response measures will immediately be taken by project personnel to assist those who have been injured and to protect others from unsafe conditions. These measures may include contacting the relevant authorities (depending on the nature of the

# RA HEALTH AND SAFETY PLAN

emergency) and/or health care facilities (see emergency contact numbers listed in Attachment A). It may also involve moving individuals to a secure location, as appropriate. On-site first-aid to an injury or illness will be provided by trained personnel. External emergency responders will be responsible for providing advanced life support services.

If an incident involves a fire that cannot be controlled with an extinguisher, the work area and/or vessel will be evacuated immediately. The PSM (or on-site designee) will promptly contact external fire department personnel whenever there is a fire, regardless of its intensity.

Upon the occurrence of any event during the performance of the work which requires reporting to the National Response Center (NRC) under Section 103 of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), such reporting will be made by GE or their designee. GE will notify USEPA and New York State Department of Environmental Conservation (NYSDEC) of any incident that may present an immediate threat to public health or welfare or the environment, by immediately (upon obtaining knowledge of the incident) notifying USEPA's team leader, or, in the event of the unavailability of the team leader, the USEPA project coordinator or alternate USEPA project coordinator; and also notifying the NYSDEC project manager, or, in the event of the unavailability of the NYSDEC project manager, the Chief of NYSDEC's Hudson River Unit or the New York State Department of Health (NYSDOH) Bureau of Environmental Exposure Investigation.

If any action or occurrence during the performance of the work causes or threatens to cause a release of a hazardous substance that may present an immediate threat to public health or welfare or the environment, the USEPA and the NYSDEC will be notified by GE or its designee immediately on obtaining knowledge of such action or occurrence. Such notifications will be made to one of the USEPA project coordinators and to the NYSDEC Hudson River project manager (or, in the event of their unavailability, to their alternate contacts).

The following subsections present procedures for fire response and spill prevention/response.

## **10.2.2 Fire Response**

All personnel are trained in the use of fire extinguishers during the Project Safety Orientation and instructed to use a fire extinguisher for incipient stage fires only.

In the event of a fire at the sediment processing facility, a telephone call will be made to 911 regardless of whether the PSM (or on-site designee) determines a need for external response. The arriving unit will report to the designated entry location and will be met by the PSM (or on-site designee) and briefed. The CM staff will provide the lead officer with facility-specific information and logistical support, as needed.

# RA HEALTH AND SAFETY PLAN

In the event of an incipient stage fire affecting river based operations, the dredging contractor's personnel will attempt to extinguish the fire with onboard equipment (typically fire extinguishers). If a fire cannot be extinguished by dredging personnel, then they will call 911 and follow emergency response procedures, including abandoning the vessel if necessary. The lead officer will respond to a designated location, will be met by the PSM (or on-site designee) and briefed. Based on the incident, the lead officer will deploy appropriate water rescue resources with the assistance of project personnel. The CM staff will assist external responders with operational support (e.g., stopping dock work and barge movement) and by providing assistance (e.g., boats, vehicles, PPE).

## 10.2.3 Spill Prevention/Response

In the event of a spill, response actions will be primarily guided by the spill prevention, control, and countermeasure (SPCC) plans prepared by the dredging contractor (for in-river activities) and the processing facility contractor (for incidents on the main site). As of the writing of this RA HASP, the contractors have not been selected and the SPCCs have not been written. For the purposes of this RA HASP, a general response approach has been summarized below.

In the event of an accidental release of a toxic or hazardous material, the employee observing the incident must immediately notify the site supervisor, and if possible, proceed to control the emergency situation.

When determining the possible hazards to human health and/or the environment that may result from the incident, the PSM must consider both the direct and indirect effects of the release, assess the possible effects of any toxic, irritating, or asphyxiating gases that are generated, and determine the effects of any hazardous run-off from water or chemical agents used to control fire and heat-induced explosions.

### 10.2.3.1 Spill Response Procedures – Processing Facility

There is less concern about spills at the processing facility because of the built-in collection, containment, and treatment system designed to effectively address dredged and processed materials. Nonetheless, a significant accident or spill of material could warrant immediate actions by the facility contractor to protect human health and safety, assess the severity of the event, and take appropriate mitigation measures, if needed. The event would be evaluated by the CM and contractor to determine its causes and future prevention, and proper project authorities would be notified of the event.

Generally, on-site spills from a project truck will be picked up and placed back in the truck, while spills during the process of loading rail cars will be picked up and placed into the rail car.

# RA HEALTH AND SAFETY PLAN

## 10.2.3.2 Spill Response Procedures – In River Activities

All project vessels will be required to have USCG safety equipment, including ship-to-shore very-high-frequency (VHF) radios and cellular phones to alert the CM and local responders of a spill.

The responders' first priority will be to assess the safety, rescue, or medical needs of members of the public and workers immediately affected by the spill.

At the same time, the apparent scale and severity of the spill will be evaluated so that appropriate response actions can be taken. Notification to the CM will be promptly made. The CM will aid in summoning the contractor's spill response team or other support personnel. In all cases, the location and time of the spill, the vessels and people involved, and other important details will be conveyed to assist response actions and reporting.

Third, the spill will be contained and controlled. If the spill appears incidental (e.g., brief duration and of limited spatial extent), containment may not be necessary or feasible. If the spill is of a larger magnitude (larger quantity, longer duration or spatial extent), contingency measures will be implemented per the SPCC plan, once developed. These measures will include actions to contain and control the spill to the extent possible (e.g., safe, feasible, consistent with other project requirements), thereby stopping the spill, securing and stabilizing the immediate area, and taking steps to minimize the spread of the spill. Special consideration will be given to large spills that occur in portions of the river or canal that are known to be relatively free of PCBs or that have already been dredged and backfilled/capped in accordance with USEPA performance standards for residual sediments.

Fourth, the spill will be cleaned up or mitigated. A pre-planned course of action for the recovery of any spilled material containing PCBs will be implemented. As needed, appropriate, and feasible after a significant spill, the project team would promptly undertake one or more of the following actions:

- *No immediate direct action:* This may be appropriate for smaller spills that would not be expected to cause significant or detectable effects, or if the spill occurs in portions of the river that are targeted for dredging but have not yet been remediated.
- *Continue source control and containment and increase monitoring:* This may be appropriate for spills that are brief and quickly contained or that are not migrating; spill material sampling or additional monitoring would help determine effects of the spill (if any) and what next steps may be warranted to clean up or further mitigate the spill.
- *Isolate spill under clean backfill/capping material:* This may be appropriate for small or limited spills in portions of the river where sediments have already been dredged but not backfilled. The backfill/capping material could isolate the spill and mitigate transport and potential exposure to the water column and biota.

## RA HEALTH AND SAFETY PLAN

- *Remove spill during residuals dredging program:* This may be appropriate for larger spills in portions of the river where inventory dredging has already occurred. If sampling/monitoring of the spill area indicates unacceptable levels of PCB concentrations, then the material would be targeted and removed during residuals dredging.
- *Remove spill immediately:* This may be appropriate for larger spills that have the potential to cause exceedances at near- or far-field water monitoring stations, or for larger/longer spills that impact sediments outside the dredge areas or previously dredged and capped sediments in the river or Champlain Canal. If warranted by the severity of the spill, immediate action would be taken to remove the spill to prevent or stop exceedances and/or preserve the integrity of a remediated or non-dredged area.
- *Remove spill during demobilization:* This may be appropriate for incidental spills that unavoidably recur but because of their limited scale or location in active work areas, do not necessitate a response until after all work is completed at the site. For example, if a very small amount of material is infrequently but unavoidably lost during unloading at the processing facility wharf (even though systems are in place to prevent such losses), it may be most prudent to monitor the situation and then remediate the area after all active handling of PCB-containing sediments is complete and the processing facility is being decommissioned or restructured for some future alternative land use.

### 10.2.3.3 Spill Reporting Requirements

This section applies only to spills and releases within the sediment processing facility or on the river. Reporting and responding to off-site accidents involving a release from loaded rail cars are the responsibility of the rail carriers.

Federal and state laws and regulations define when a spill or release must be reported. Pursuant to its authority under the CERCLA, USEPA has developed a list of hazardous substances that, if released to the environment in an amount greater than a defined reportable quantity (RQ), must be reported. For example, in the case of PCBs, the person in charge of a facility must immediately report upon learning that one pound or more of PCBs has been released to the environment within a 24-hour period.

Under its authority granted by the Federal Water Pollution Control Act (FWPCA), USEPA has developed a similar list of reportable quantities of hazardous substances in the event of a release of hazardous substances to the navigable waters. As with the CERCLA list, these require reporting if an amount exceeding an RQ is spilled into the water. In addition, the Oil Pollution Act (OPA) requires notification if a sheen of oil is visible on the water.

Under state law, NYSDEC has developed its own list of hazardous substances that, if released to the environment, must be reported. That law [6 NYCRR Part 595, 597] requires the

## RA HEALTH AND SAFETY PLAN

reporting of releases above a defined RQ (in the case of PCBs, one pound or more) to NYSDEC immediately, but within two hours after the discharge. State law also requires reporting of releases involving less than the RQ if the release may result in fire, explosion, exceedance of air and water quality standards, or injury to the public.

In addition, Section 17-1743 of the NYSDEC Law requires that a person who stores more than 1,000 gallons of any liquid (including petroleum) must immediately report any release of the liquid to land or waters.

Finally, New York's Navigation Law requires any person responsible for causing a discharge of oil or other petroleum to land or water notify NYSDEC immediately, but within two hours after the discharge, unless: (1) the spill is less than 5 gallons; (2) the spill is contained; (3) the spill has not and will not reach the water or any land; and (4) the spill is cleaned up within two hours of discovery.

If the release or spill requires reporting under CERCLA, the FWPCA, or the OPA, a telephone call will be placed to the National Response Center. Additional reports are required by Paragraph 41 of the consent decree. Under that paragraph, if a release must be reported under CERCLA, then GE is also required, within 24 hours of obtaining knowledge of the onset of the event, to orally notify USEPA's team leader, Hudson River Team, Emergency and Remedial Response Division, USEPA Region 2; or, in the event that the team leader is not available, either the USEPA project coordinator or the alternate USEPA project coordinator). GE is also required to provide oral notification to the NYSDEC project manager, Hudson River PCBs Superfund Site; or, in the event of the unavailability of the NYSDEC project manager, to the chief of NYSDEC's Hudson River Unit and to the NYSDOH Bureau of Environmental Exposure Investigation.

At a minimum, personnel reporting a spill or release must provide the following information to the site supervisor (using the Incident/Near-Miss Investigation Report provided as Attachment F, or equivalent):

- Location of the release or threatened release;
- The material released or threatened to be released;
- The approximate quantity and concentration of the release or threatened; and
- Any other information as required for compliance with NRC or NYSDEC reporting requirements (NYSDEC, 1996).

The contractor's supervisor will then contact the CM and notify them of the incident. The CM's project manager will notify GE and its representatives of the incident and determine if reports to the NRC or NYSDEC are required.

# RA HEALTH AND SAFETY PLAN

## 10.3 EMERGENCY INFORMATION

The means to summon local public response agencies such as police, fire, and ambulance will be reviewed in the project orientation. Emergency contacts are listed in Attachment A. The following sub-sections provide information on medical emergencies and first aid while working at the site.

### 10.3.1 First Aid

First aid will be provided by trained personnel. Injuries and illnesses requiring medical treatment must be documented. The site supervisor must conduct an incident investigation as soon as emergency conditions no longer exist and first-aid and/or medical treatment has been administered. The report must be completed and submitted to the PSM and appropriate SSR within 24 hours after the incident.

If first-aid treatment is required, first-aid kits are kept at the CM office trailer and in each construction vehicle assigned to a supervisor. If treatment beyond first aid is required, the injured should be transported to the medical facility. If the injured is not ambulatory, or shows any sign of not being in a comfortable and stable condition for transport, then an ambulance/paramedic should be summoned. If there is any doubt as to the injured worker's condition, it is best to let the local paramedic or ambulance service examine and transport the worker.

#### 10.3.1.1 Emergency Care Steps

The steps listed below must be followed in the event of an injury at the site:

- *Survey the scene.* Determine if it is safe to proceed. Try to determine if the conditions that caused the incident are still a threat. Protect yourself from exposure before attempting to rescue the victim.
- *Do a primary survey of the victim.* Check for airway obstruction, breathing, and pulse. Assess likely routes of chemical exposure by examining the eyes, mouth, nose, and skin of the victim for symptoms.
- *Phone Emergency Medical Services (EMS).* Give the location, telephone number used, caller's name, what happened, number of victims, victims' condition, and help being given.
- *Maintain airway and perform rescue breathing* as necessary.
- *Perform CPR* as necessary.
- *Do a secondary survey of the victim.* Check vital signs and do a head-to-toe exam.
- *Treat other conditions as necessary.* If the victim can be moved, take the victim to a location away from the work area where EMS can gain access.

# **RA HEALTH AND SAFETY PLAN**

## **10.3.1.2 Inhalation**

Any employee complaining of symptoms of chemical overexposure will be removed from the work area and transported to the designated medical facility for examination and treatment.

## **10.3.1.3 Ingestion**

Call EMS and consult a poison control center for advice. If available, refer to the MSDS for treatment information, if recommended. If unconscious, keep the victim on his or her side and clear the airway if vomiting occurs.

## **10.3.1.4 Skin Contact**

Personnel who have had skin contact with contaminated sediment will, unless the contact is severe, proceed through the decontamination zone to the wash-up area. Personnel must remove any contaminated clothing and then flush the affected area with water for at least 15 minutes. The individual should be transported to the medical facility if showing any sign of skin reddening or irritation, or if requesting a medical examination.

## **10.3.1.5 Eye Contact**

Field personnel who have had contaminated sediment splashed in their eyes or who have experienced eye irritation while in the contaminated zone must immediately proceed to the eyewash station set up in the decontamination zone. Do not decontaminate prior to using the eyewash. Remove whatever protective clothing is necessary to use the eyewash. Flush the eye with clean running water for at least 15 minutes. Arrange prompt transport to the designated medical facility.

## **10.3.2 Medical Emergency – Processing Facility**

In the event of a medical emergency at the sediment processing facility, a telephone call will be made to 911 and the Emergency Care Steps in Section 10.3.1.1 will be followed until medical personnel arrive. The arriving unit will report to a designated entry location. The lead officer will be met by the PSM (or on-site designee) and briefed or will immediately receive injured personnel for evaluation and/or transport. In the event injured personnel cannot be moved, emergency personnel will be escorted to the incident location.

Emergency personnel will be provided with any site-specific PPE beyond their own response gear. Response personnel will have access to any on-site emergency response equipment, as needed. If the injured personnel cannot be decontaminated due to the possibility of causing further injury, the necessary PPE and supplies will be provided to protect emergency response personnel or equipment from decontamination.

# RA HEALTH AND SAFETY PLAN

## 10.3.3 Medical Emergency – Wharf Area

Call will be made to 911. The lead officer will respond to the designated location and will be met by the PSM and briefed. Based on the incident, the lead officer will deploy appropriate water rescue resources with assistance from project personnel. Project personnel will assist external responders with operational support (e.g., stopping dock work and barge movement) and by providing assistance (e.g., boats, vehicles, PPE).

## 10.3.4 Medical Emergency – Dredging Areas

The dredging contractor will divide the Phase 1 dredging area into specific river control zones for emergency response and navigation control. A figure will be created by the contractor to define these control zones which will be included in the contractor's Worker HASP, to be attached in Appendix A.

In the event of an emergency, a call will be made to 911 and the designated control zone where the emergency has occurred will be identified. The lead officer will respond to the designated location. Injured personnel who are in a condition to be transported will be transferred by project vessel to a designated location. If injured personnel cannot be transported, the lead officer will go to the designated location to be greeted by the PSM and briefed. External emergency responders will be directed to the scene if using their own vessel. Response personnel will have access to project emergency equipment, including vessels, as needed. If the injured personnel cannot be decontaminated due to the possibility of causing further injury, the necessary PPE and supplies will be provided to protect emergency response personnel or equipment.

## 10.3.5 Water Emergency – Man Overboard

Call will be made to 911. Onboard personnel may attempt to rescue the overboard person, if it can be done safely. Arriving unit(s) will report to a designated entry location. The lead officer will be met by the PSM and briefed or will immediately receive injured personnel for evaluation and/or transport. Project support vessels, personnel, and/or equipment will be made available to external emergency responders, as well as any land-based logistics and support equipment.

## 10.3.6 Emergency Contacts

The means to summon local public response agencies such as police, fire, and ambulance will be reviewed in the project orientation. These potential agencies are identified in Attachment A. A general map and directions to the Glens Falls, New York hospital from both the the Sediment Processing and Dewatering Facility and the West River Road Marine Staging Area are provided in Figure 5. Final turn-by-turn directions to hospitals will be provided once office addresses are established.

# **RA HEALTH AND SAFETY PLAN**

## **10.4 REPORTING INJURIES, ILLNESSES, AND NEAR-MISS INCIDENTS**

All injuries and illnesses, however minor, will be reported to the site supervisor immediately. The site supervisor will complete an Incident/Near-Miss Investigation Report (Attachment F) and submit it to the PSM and the appropriate SSR within 24 hours.

Near-miss incidents are situations in which no injury or property damage occurred, but under slightly different circumstances an injury or property damage could have occurred. Near misses are caused by the same factors as injuries; therefore, they must be reported on the Incident/Near-Miss Investigation Report (Attachment F) and investigated in the same manner.

Incident investigations will involve labor-management teams that will document the circumstances of the injury/damage/near miss and arrive at root causes and corrective actions.

# **RA HEALTH AND SAFETY PLAN**

## **SECTION 11**

### **AUDITS AND CORRECTIVE ACTION**

#### **11.1 FORMAL SITE AUDIT**

The field audit protocol is designed to identify and correct unsafe behaviors, acts, or conditions in each contractor's scope of work. The CM will conduct site audits regularly. Items found to be out of compliance must be assigned corrective action and the corrective action tracked to completion. The PSM maintains the original audit documentation on file. Contractors are required to complete their own weekly formal audit and submit a copy to the CM.

#### **11.2 DAILY SITE WALK CHECKLIST**

The CM's project personnel conduct a daily safety site walk to identify problem areas. Items found to be out of compliance must be assigned corrective action and the corrective action tracked to completion. Contractors are required to document their daily checklist inspection and submit to the CM.

#### **11.3 ENFORCEMENT**

CM and contractors enforce all applicable requirements of OSHA 1910 and 1926, New York State Department of Labor codes, rules and regulations and contract requirements. Contractor will have written progressive disciplinary systems available for review in the respective contractor HASP.

#### **11.4 NOTICE OF VIOLATION**

The project has a formal notice of violation (NOV) of safety and health regulations program to ensure that violations are issued in an imminent danger situation or when the contractor repeatedly fails to comply with safety and health requirements.

The NOV documents poor performance and requires a response from contractor senior management. The notice contains five distinct levels of discipline, from submission of a recovery plan to contract termination.

1. Contractor is notified of the violation and should take corrective action to prevent a reoccurrence. The corrective action shall be documented to the CM representative immediately.
2. Contractor must submit a plan for compliance to CM within two days of receipt of a formal letter. The compliance plan must include the means of compliance and the date

## RA HEALTH AND SAFETY PLAN

that the requirements for compliance will be completed. Once compliance has been achieved, a follow-up letter must be sent to the CM.

3. Contractor is required to review the stated procedures with the CM. Work may not commence on the site until the review is complete and the contractor responds formally that the procedure is understood and will comply.
4. Contractor is required to review the stated procedures with CM. Work may not commence on the site until the review is complete, and contractor **must** confirm formally the disciplinary action to be taken against the supervisor and employees.
5. All work on the site will stop until the CM reviews all the facts with the subcontractor and determines whether the contract between the parties will be terminated.

# RA HEALTH AND SAFETY PLAN

## SECTION 12

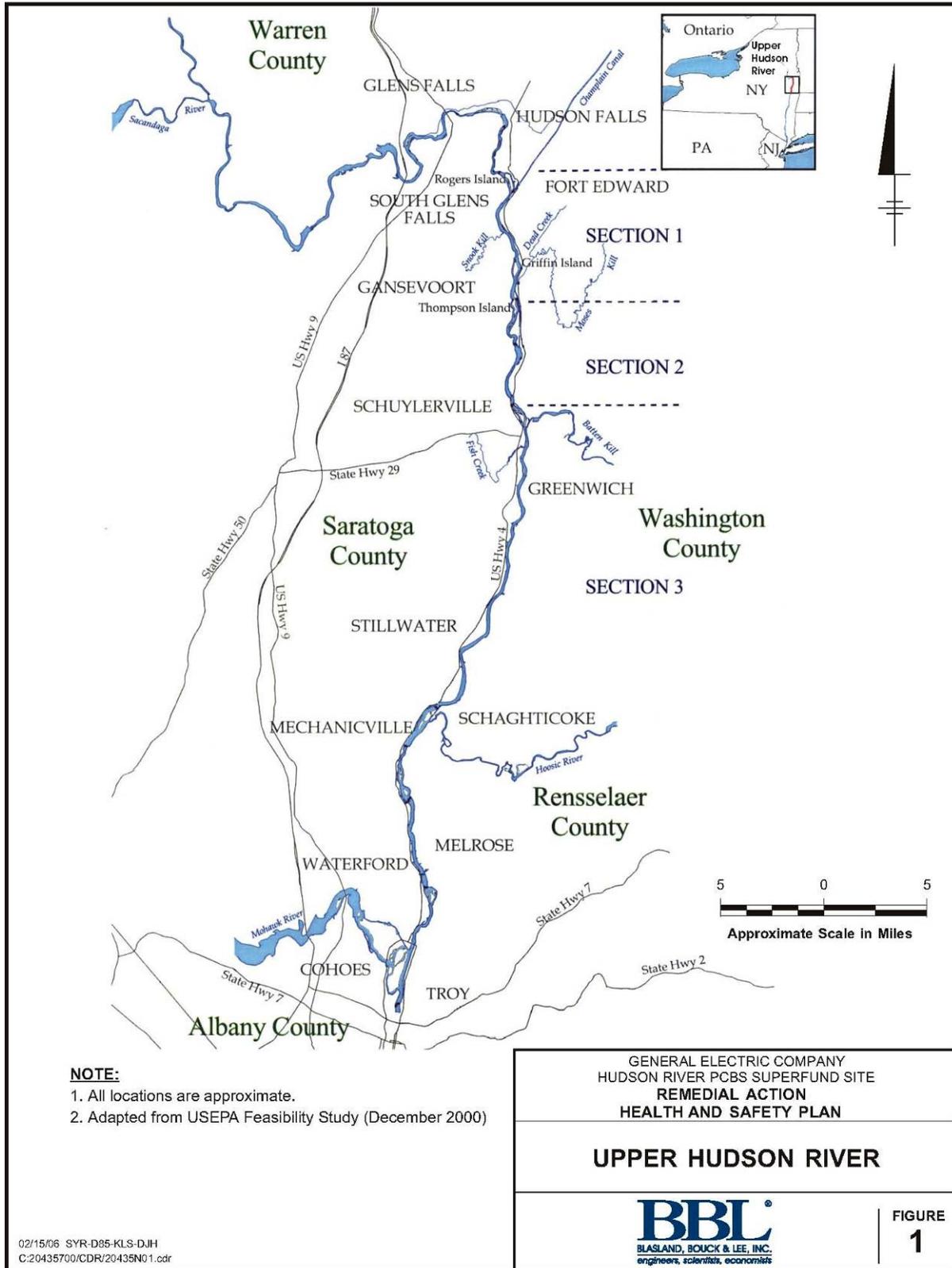
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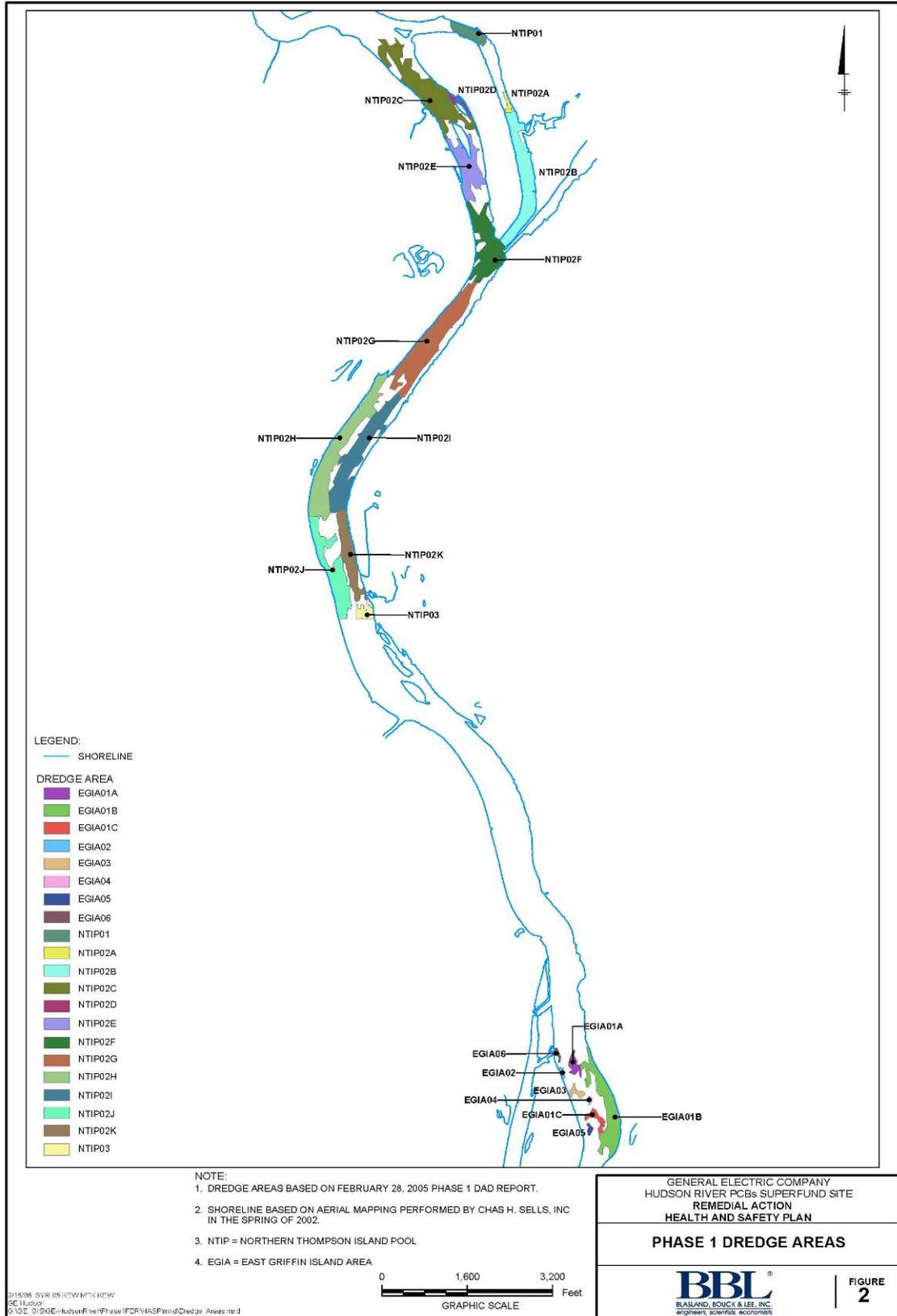
# RA HEALTH AND SAFETY PLAN

## FIGURES

# RA HEALTH AND SAFETY PLAN



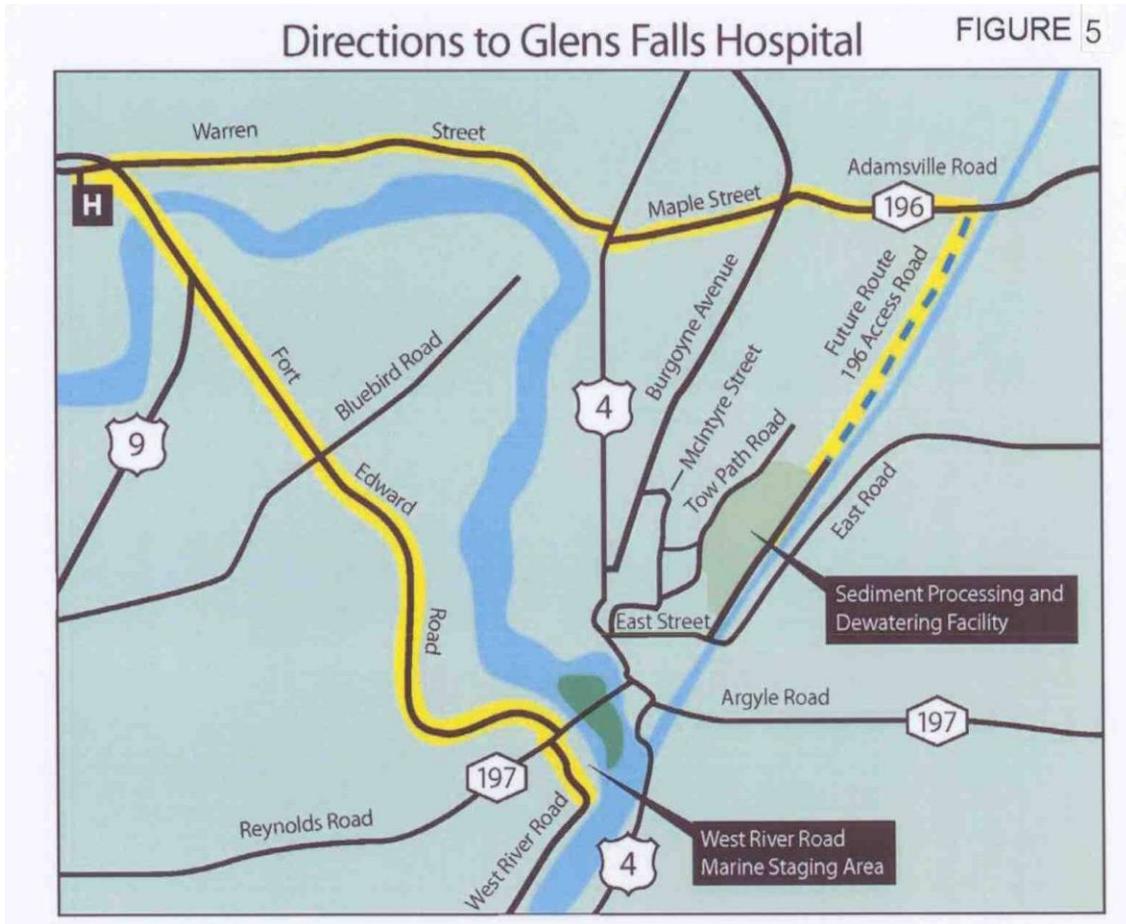
# RA HEALTH AND SAFETY PLAN







# RA HEALTH AND SAFETY PLAN



## **DIRECTIONS FROM THE SEDIMENT PROCESSING AND DEWATERING FACILITY**

1. From **ACCESS ROAD**, turn **L** onto **ROUTE 196** - go a few miles,
2. Turn **R** on **MAIN STREET [US-4]** - go **0.1 mi**
3. Bear **L** to follow **US-4 NORTH** - go **0.1 mi**
4. Continue of **PARK PL** - go **0.1 mile**
5. Bear **R** on **RIVER STREET (RTE 254)** - go **0.7 mi**
6. Continue to follow **RTE 254** - go **0.6 mi**
7. **RTE 254** becomes **LOW WARREN STREET** - go **0.6 mi**
8. **LOWER WARREN STREET** becomes **WARREN STREET (RT-32)** - go **1.3 mi**
9. Bear **L** on **HUDSON AVE** - go **0.2 mi**
10. Turn **L** on **SCHOOL STREET** - go **0.1 mi**
11. Turn **R** on **PARK STREET** - go **0.1 mi**
12. Arrive at **HOSPITAL - 100 PARK STREET, GLENS FALLS** on the **L**

## **DIRECTIONS FROM THE WEST RIVER ROAD MARINE STAGING AREA**

1. Start at **MARINE STAGING AREA**,
2. Turn **R** on **W RIVER RD** - go **0.2 mi**
3. Turn **R** on **Reynolds RD [ RT-197]** - go **0.1 mi**
4. Turn **L** on **FORT EDWARD RD** - go **3.0 mi**
5. Continue to follow **CR-28** - go **0.8 mi**
6. Continue on **MAIN ST [US9]** - go **0.5 mi**
7. Continue to follow **US-9** - go **0.3 mi**
8. Turn **L** on **PARK ST** - go **0.2 mi**
9. Arrive at **HOSPITAL - 100 PARK STREET, GLENS FALLS** on the **L**

# **RA HEALTH AND SAFETY PLAN**

## **ATTACHMENT A**

### **SITE SAFETY PERSONNEL TELEPHONE NUMBERS**

# RA HEALTH AND SAFETY PLAN

## ATTACHMENT A

### EMERGENCY AND SITE SAFETY PERSONNEL CONTACT INFORMATION

#### EMERGENCY CONTACT INFORMATION

*(in Alphabetical Order)*

<b>Emergency Contact</b>	<b>Contact Name</b>	<b>Emergency No.</b>	<b>Alternate No.</b>
Canadian Pacific Railway Police Communication Ctr.	N/A	800-716-9132	518-383-7200
Ft. Edward Police Department	Chief of Police Walter Sandford	911	518-747-6365 (station); 518-747-2782 (cell)
Ft. Edward Rescue Squad	Nicole Marchese	911	518-747-6198
Ft. Edward Fire Department	Chief Matt Hurlburt	911	518-747-8309 (station); 518-747-0873 (home) 518-796-6735 (cell)
GE	Operations Manager., Tim Kruppenbacher		518-746-5247 (office)
GE	Program Manager, John Haggard		518-862-2739 (office)
Moreau Emergency Squad	Andre Delvaux	911	518-793-3011 (station); 518-791-2306 (cell); 518-793-2197 (home)
National Response Center and Terrorist Hotline	N/A	800-424-8802	N/A
New York State Canal Corporation	Director, Office of Policy Imp. and Planning John Callaghan Sgt. Mark Phillips	911	518-471-4220  800-635-8856 (office)
New York State Department of Environmental Conservation	Hudson River Project Manager Kevin Farrar	N/A	518-402-9784
New York State Department of Environmental Conservation	Hudson River Unit, Division of Environmental Remediation, William Daigle	N/A	518-402-9676
New York State Department of Health (Glens Falls)	Director Anita Gabalski	N/A	518-793-3893
New York State Police	Troop "G" Headquarters	N/A	518-783-3211

## RA HEALTH AND SAFETY PLAN

<b>Emergency Contact</b>	<b>Contact Name</b>	<b>Emergency No.</b>	<b>Alternate No.</b>
New York State Police	Troop "T" Headquarters	N/A	800-635-8856
New York State Spill Response Program	Coordinator Janet Crawford	N/A	800-457-7362
Parsons	Construction manager, Larry Hartman		(303) 668-3170
Poison Control Center	N/A	800-222-1222	N/A
Saratoga County Office of Emergency Services	County Coordinator Mike McEvoy	N/A	518-885-2232 (station); 423-6600 (cell)
Saratoga County Sheriff	Sheriff James Bowen	911	518-885-2450
South Glen Falls Fire Company	Chief James Ryan	911	518-792-1674 (station); 798-4020; 792-1674; Tom Tracy 792-0510 (home)
U.S. Coast Guard (Station Burlington, VT)		911	802-951-6792
U.S. Environmental Protection Agency	Hudson Falls Field Office Director David King	N/A	518-747-4389
U.S. Environmental Protection Agency	Hudson River Team Leader Doug Garbarini	N/A	212-637-3952
Warren County Sheriff	Sheriff Bud York	911	518-761-6477
Washington County Department of Public Safety	Director William Cook	911	747-7520 (station); 361-5513 cell; 747-0472 (home)
Washington County Sheriff	Undersheriff Matthew Mabb	911	518-746-2475 (station); 744-5139 (cell); 747-0126 (home)

# RA HEALTH AND SAFETY PLAN

## SITE SAFETY PERSONNEL CONTACT INFORMATION

<b>Project Role</b>	<b>Relevant Activities</b>	<b>Telephone Numbers</b>
<b>Safety Manager (for CM)</b>		
Jerry H. Clark, CSP, CIH	All RA activities	Office: (518) 746-6071
<b>GE Environmental, Health and Safety Leader (for GE)</b>		
Robert Gibson	All RA activities	Office: (518) 862-2736
<b>Construction Safety Representative (for CM)</b>		
Mark Dziarnowski	Facility Site Work, Rail Yard, and Processing Facility Construction	Office: (518) 746-6071
<b>Processing Safety Representative (for CM)</b>		
TBD	Processing Facility Operations	TBD
<b>Dredging Safety Representative (for CM)</b>		
TBD	Dredging Operations	TBD

# **RA HEALTH AND SAFETY PLAN**

## **ATTACHMENT B**

### **HEALTH AND SAFETY PLAN ACKNOWLEDGMENT**



# **RA HEALTH AND SAFETY PLAN**

## **ATTACHMENT C**

### **SAFETY TOOLBOX MEETING LOG**

# RA HEALTH AND SAFETY PLAN

Safety Meeting Presenter: \_\_\_\_\_ Date: \_\_\_\_\_

## Current Weather Conditions:

Temperature (°F) = \_\_\_\_\_ Wind Direction = \_\_\_\_\_ Wind Speed = \_\_\_\_\_

Clear - Sunny – Cloudy – Rain - Snow      Forecast = \_\_\_\_\_

## Current Site Conditions (circle as appropriate):

Dry - Wet - Muddy - Frozen - Snow Covered - Other (describe) \_\_\_\_\_

1. Near-Miss, Incidents or Injuries to report from Previous Day Activities: No  Yes  - explain below:

\_\_\_\_\_

2. Safe and/or At-Risk Observations from Previous Day Activities: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

3. Activities Taking Place Today: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

4. Anticipated Hazards: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

5. Engineering Controls-Work Practices-PPE to Protect Against Hazards: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

6. Additional Safety Topic or Comments: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_



# **RA HEALTH AND SAFETY PLAN**

## **ATTACHMENT D**

### **HOT WORK PERMIT**

# RA HEALTH AND SAFETY PLAN

## Attachment D

### Hot Work Permit

This permit becomes void:

- (1) At the end of the shift or
- (2) Whenever conditions change significantly or
- (3) On any emergency signal.

PERMIT NO. \_\_\_\_\_

DATE: \_\_\_\_\_ SHIFT: \_\_\_\_\_

BUILDING: \_\_\_\_\_ AREA: \_\_\_\_\_

NATURE OF WORK: \_\_\_\_\_

SPECIAL PRECAUTIONS: \_\_\_\_\_

IS FIRE WATCH REQUIRED?: \_\_\_\_\_

ADDITIONAL PERMIT REQUIRED?: (i.e., confined space) \_\_\_\_\_

#### STEP 2 (See reverse side for Step 1)

The location where this work is to be done has been examined, necessary precautions taken, and permission is granted for this work. (See other side)

Permit expires: \_\_\_\_\_ Signed: \_\_\_\_\_  
(SSHO)

Time started: \_\_\_\_\_ Completed: \_\_\_\_\_

#### STEP 3 FINAL CHECKUP

Work area and all adjacent areas to which sparks and heat might have spread (including floors above and below and on opposite sides of walls) were inspected 30 minutes after the work was completed and were found firesafe.

Signed: \_\_\_\_\_  
(Supervisor or Fire Watcher)

# RA HEALTH AND SAFETY PLAN

## ATTENTION

### STEP 1

Before approving and cutting and welding permit, the supervisor shall inspect the work area and confirm that precautions have been taken to prevent fire in accordance with this manual.

## PRECAUTIONS

- Sprinklers in service
- Cutting and welding equipment in good repair
- Personnel protective equipment available and in good condition

## WITHIN 35 FT OF WORK

- Floors swept clean of combustibles
- Combustible floors wet down, covered with damp sand, metal or other shields
- No combustible material or flammable liquids
- Combustibles and flammable liquids protected with covers, guards or metal shields
- All wall and floor openings covered
- Covers suspended beneath work to collect sparks

## WORK ON WALLS OR CEILINGS

- Construction noncombustible and without combustible covering
- Combustible moved away from opposite side of wall

## WORK ON ENCLOSED EQUIPMENT (Tanks, containers, ducts, dust collectors, etc.)

- Equipment cleaned of all combustibles
- Containers purged of flammable vapors

## FIRE WATCH

- To be provided during and 30 minutes after operation
- Supplied with extinguisher and small hose
- Trained in use of equipment and in sounding fire alarm
- Has necessary personnel protective equipment

## FINAL CHECKUP

- To be made 30 minutes after completion of any operation unless fire watch is provided.

Signed: \_\_\_\_\_  
(Supervisor)

# **RA HEALTH AND SAFETY PLAN**

## **ATTACHMENT E**

### **CONFINED SPACE ENTRY PERMIT**

# RA HEALTH AND SAFETY PLAN

## Attachment E

### CONFINED SPACE ENTRY PERMIT

**Location of Space:** \_\_\_\_\_ **Date(s) of Entry:** \_\_\_\_\_  
**Description of Space:** \_\_\_\_\_  
**Purpose of Entry:** \_\_\_\_\_ **Duration of Entry:** \_\_\_\_\_ (hours/days)

**Authorized Entrants:** \_\_\_\_\_

**Entry Supervisor:** \_\_\_\_\_

**Attendant(s) Name(s):** \_\_\_\_\_

Date	Name	In:	Out:	In:	Out:	In:	Out:

**Hazards Expected:** \_\_\_\_\_

**Rescue Arrangements:**

- Entry:     Non-Entry:  
     Rescue Equipment:  
     Method to Contact Rescue  
     Team:

\*Mechanical devices will be required for non-entry retrievals greater than 5 vertical feet.

**Special Requirements:** \_\_\_\_\_

	REQ'D	IN PLACE		REQ'D	IN PLACE
Lockout – de-energize	<input type="checkbox"/>	<input type="checkbox"/>	Escape Harness / Wristlets	<input type="checkbox"/>	<input type="checkbox"/>
Line Broken – capped or blanked	<input type="checkbox"/>	<input type="checkbox"/>	Lifelines	<input type="checkbox"/>	<input type="checkbox"/>
Purge – flush and vent	<input type="checkbox"/>	<input type="checkbox"/>	Mechanical Retrieval	<input type="checkbox"/>	<input type="checkbox"/>
Ventilation	<input type="checkbox"/>	<input type="checkbox"/>	Fire Extinguishers	<input type="checkbox"/>	<input type="checkbox"/>
Secure Area	<input type="checkbox"/>	<input type="checkbox"/>	Low Voltage Lighting	<input type="checkbox"/>	<input type="checkbox"/>
Supplied air with SCBA	<input type="checkbox"/>	<input type="checkbox"/>	Other: _____	<input type="checkbox"/>	<input type="checkbox"/>

# RA HEALTH AND SAFETY PLAN

**Air Monitoring (record every 2 hours):**    Continuous    Periodic \_\_\_\_\_

Date	Time of Reading	% O <sub>2</sub>	% LEL	CO (ppm)	Other: _____	Other: _____
<b>Reference Limits</b>		19.5%-23.5%	Less than 10%	35 ppm (TWA) 200 ppm (C)		

*NOTE: Evacuate immediately if O<sub>2</sub> alarm sounds (less than 19.5% or more than 23.5%).*

Individual Performing Tests: \_\_\_\_\_  
(print) (signature)

Company: \_\_\_\_\_  
 Instruments Used: \_\_\_\_\_

**Entry Documentation and Equipment:** \_\_\_\_\_

<b>Training Completed:</b>	<input type="checkbox"/> Entry Supervisor		<input type="checkbox"/> Attendant	<input type="checkbox"/> Entrants
<b>Personal Protective Equipment:</b>	REQ'D	WORN	SPECIFY	
	<input type="checkbox"/>	<input type="checkbox"/>	Gloves:	
	<input type="checkbox"/>	<input type="checkbox"/>	Protective Clothing (coveralls):	
	<input type="checkbox"/>	<input type="checkbox"/>	Eye Protection:	
	<input type="checkbox"/>	<input type="checkbox"/>	Respirator:	
	<input type="checkbox"/>	<input type="checkbox"/>	Boots:	
<b>First Aid Equipment:</b>	<input type="checkbox"/>	<input type="checkbox"/>	Other:	
	<input type="checkbox"/>	<input type="checkbox"/>	First Aid Kit	
	<input type="checkbox"/>	<input type="checkbox"/>	Eye Wash	
	<input type="checkbox"/>	<input type="checkbox"/>	Other:	

I certify that all Parsons and regulatory requirements for confined space entry, including the special requirements listed on this form, have been met.

**Entry Supervisor**

**Permit Canceled (Entry Supervisor)**

\_\_\_\_\_  
*Print*

\_\_\_\_\_  
*Print*

\_\_\_\_\_  
*Sign* *Date*

\_\_\_\_\_  
*Sign* *Date*

# **RA HEALTH AND SAFETY PLAN**

## **ATTACHMENT F**

### **INCIDENT/NEAR-MISS INVESTIGATION REPORT**

## Attachment F INCIDENT/NEAR MISS INVESTIGATION REPORT

Date of Incident:		Client:		Client Contact:	
Project Name:		Project Location:		Project Manager:	
Time of Incident:	Job/WBS:	Incident Reported by:			
Type of incident (check one): ? Near-miss incident ? Personal injury ? Property damage ? Environmental spill/release			Name of Company/Subcontractor:		
Name Of Individual(s) Involved:				Trade/Function:	
Was the individual involved with the incident performing their regular job? If "no", explain why:		Date of Site Safety Orientation:		Last Formal/Documented Safety Meeting Attended:	
Description of incident according to the individual(s) involved or injured (including what happened and how the incident occurred):					
According to the individual(s) involved with the incident or injured, what could have been done differently to prevent this incident from occurring?  Why weren't these done prior to the incident?					
Describe any First Aid or Medical Treatment Provided On Site and/or at a Medical Facility.					
Did the Individual Return to Work by the next day?		Any Work Restrictions or Lost Time?		If "Yes", describe:	

**Complete the information below with an Investigation Team, if appropriate.**

<p>Team Investigation – List the Possible Causes of the Incident Below (specify <b>Personal Factors</b> (1 = lack of skill/knowledge, 2 = following correct procedure takes more time, 3 = supervisor reinforces unsafe behavior, 4 = did it this way before without adverse consequences), <b>Job Factors</b> (5 = lack of or inadequate procedure, 6 = inadequate communication of expectations or procedure, 7 = inadequate tools or equipment) or <b>External Factors</b>).</p> <p>1. 2. 3. 4.</p>		
<p>For Each Possible Cause Listed Above, Reply "Why" or "Why not" the Cause Occurred.</p> <p>1. 2. 3. 4.</p>		
<p><b>Corrective Action(s) for Each Cause - List Person(s) Responsible and Target Date:</b></p> <p>1. 2. 3. 4.</p>		
Investigation Team Members:		
Approval (Individual Involved/Injured):	Signature:	Date:
Supervisor Approval (Print Name):	Signature:	Date:

# **RA HEALTH AND SAFETY PLAN**

## **ATTACHMENT G**

### **PRE-DRILLING/SUBSURFACE CHECKLIST FOR INTRUSIVE FIELDWORK**

# RA HEALTH AND SAFETY PLAN

## PREDRILLING/SUBSURFACE CHECKLIST FOR INTRUSIVE FIELDWORK

Site Name: \_\_\_\_\_ Job Number: \_\_\_\_\_  
 Site Phone Number: \_\_\_\_\_  
 Site Address: \_\_\_\_\_ County: \_\_\_\_\_  
 Client Proj. Mgr.: \_\_\_\_\_ Phone: \_\_\_\_\_  
 Site Manager Contacted Date: \_\_\_\_\_ By: \_\_\_\_\_  
 Site Drawings (yes / no / NA) \_\_\_\_\_ (please attach) Historical Drawings (yes / no / NA) \_\_\_\_\_  
 Third Party Construction/Redevelopment Plans ( Yes/No/NA) \_\_\_\_\_

\*\*\*ATTACH SITE FIGURE WITH PROPOSED BORING LOCATIONS

Subcontractor's (drillers, concrete, etc...) Company \_\_\_\_\_  
 Subcontractor's Contact Person \_\_\_\_\_ Phone \_\_\_\_\_  
 Meeting / Start Date \_\_\_\_\_ Time \_\_\_\_\_

1) Health and Safety Signoff Form Completed? (Yes/No) Date \_\_\_\_\_

2) Utility Protection Services (Minimum 48 Hrs. Advance Notice, State Specific Notification Period Supercedes)  
 Called: Date \_\_\_\_\_ Time \_\_\_\_\_ Initials \_\_\_\_\_  
 Reference # \_\_\_\_\_  
 Proposed Drilling Locations Premarked for Locating Service. Y / N

3) Private or In-House Utility Locating Service Performed? Y / N \_\_\_\_\_  
 Called: Date \_\_\_\_\_ Time \_\_\_\_\_ Initials \_\_\_\_\_  
 Name of Locating Service: \_\_\_\_\_  
 Telephone #/ contact: \_\_\_\_\_  
 Name of Supplier Locating Technician: \_\_\_\_\_  
 Type of sensing equipment used: \_\_\_\_\_  
 Proposed Drilling Locations Premarked Y / N

4) Other Potential Underground Structures  
 Name of City Engineer/Utility Representative: \_\_\_\_\_  
 Telephone #: \_\_\_\_\_  
 Date Notified \_\_\_\_\_ Maps: Y / N  
 Cleared: Y / N

5) COMPLETED SITE WALKOVER W/ SITE MANAGER/DESIGNEE OR OWNER/TENANT REP. Y / N  
 Name of Site Manager: \_\_\_\_\_  
 Name of Property Owner/Tenant Representative: \_\_\_\_\_  
 Cleared: Yes / No  
 Building Utility Service Line Connections Identified: Y / N  
 (Hand sketch on site map w/proposed boring locations and most likely utility trench locations)

6) Utility Inventory: Y / N

Utility	Name	Depth (ft) (If Available)	Phone	Notified - Date	Marked
<u>Above Ground Services</u>					
Electric	_____	NA	_____	Y / N _____	Y / N
Telephone	_____	NA	_____	Y / N _____	Y / N
Cable	_____	NA	_____	Y / N _____	Y / N
Overhead Supports	_____	NA	_____	Y / N _____	Y / N
Traffic light cables	_____	NA	_____	Y / N _____	Y / N

# RA HEALTH AND SAFETY PLAN

## PREDRILLING/SUBSURFACE CHECKLIST FOR INTRUSIVE FIELDWORK

6) Utility Inventory Continued:

**Below Ground Services:**

Electric					Y / N		Y / N
Telephone					Y / N		Y / N
Cable					Y / N		Y / N
Gas					Y / N		Y / N
Water					Y / N		Y / N
UST System					Y / N		Y / N
Storm					Y / N		Y / N
Sanitary					Y / N		Y / N
Steam					Y / N		Y / N
Pipeline Companies					Y / N		Y / N
<b><u>Other:</u></b>					Y / N		Y / N
					Y / N		Y / N
					Y / N		Y / N

- 7) **Site-Specific Emergency Contingency Plan Incorporated in Health & Safety Plan** Y / N
- 8) **Drilling Locations Approved by Client Project Manager Named Above?** Y / N
- 9) **Signature of Parsons' Project Mgr. (required to begin fieldwork):**

\_\_\_\_\_  
Name of Project Manager

\_\_\_\_\_  
Signature of Project Manager

\_\_\_\_\_  
Name of Parsons Field Personnel

\_\_\_\_\_  
Signature of Field Personnel

(This document to be included with the site H&S Plan and should be available upon request.)

**ADDITIONAL COMMENTS / NOTES:**

# RA HEALTH AND SAFETY PLAN

## APPENDIX A

### CONTRACTOR HEALTH AND SAFETY PLANS

CONTRACT 1 – D.A. COLLINS CONSTRUCTION CO., INC.\*

CONTRACT 2 – RAILWORKS TRACK SERVICES, INC.\*

CONTRACT 3A – SEVENSON ENVIRONMENTAL SERVICES, INC.\*

CONTRACT 3B – SHAW ENVIRONMENTAL, INC.\*\*

CONTRACT 4 – CASHMAN DREDGING AND MARINE CONTRACTING CO.\*\*

CONTRACT 5 – ENSR CORPORATION\*\*

CONTRACT 6 – MHF LOGISTICAL SOLUTIONS, INC.\*\*

\* Previously submitted.

\*\* Contractor HASPs are under development. Copies will be made available to EPA upon request for informational purposes only before the commencement of Phase 1 Dredging Operations.

# **RA HEALTH AND SAFETY PLAN**

## **APPENDIX B**

### **GE EHS REQUIREMENTS**

# **GE ENVIRONMENTAL, HEALTH, AND SAFETY REQUIREMENTS**

## **Construction Management Services Agreement**

### **Between General Electric Company and CM**

#### **1.0 GENERAL SCOPE**

CM recognizes that the life, health and safety of persons and property during performance of the work is a material requirement of this Agreement. Accordingly, CM pledges to implement all necessary precautions for the prevention of accidents, and shall cooperate fully with Owner in addressing and resolving with due diligence any safety concerns that may be raised by Owner or its consultants during execution of the work, including, without limitation, the immediate suspension of all work until such time as pending safety issues are satisfactorily resolved. Notwithstanding the foregoing, CM shall remain primarily responsible for all its acts and omissions, and those of its employees, agents, subcontractors and suppliers, and their respective employees, agents, sub-subcontractors, and suppliers, regardless of tier, including those affecting life, health, and safety of persons and property.

#### **2.0 COMPLIANCE WITH LAWS, RULES, REGULATIONS & STANDARDS**

- A. CM shall comply, and shall require its employees, agents, subcontractors, and suppliers, and their respective employees, agents, sub-subcontractors and suppliers, regardless of tier, with:
1. the requirements of all applicable National, Provincial, and Local laws, rules and regulations, including but not limited to those governing building construction, use of tools and equipment, and the safety of persons and property;
  2. all rules and regulations of OSHA or other applicable governmental entities, Owner, and any other stakeholder which may be in effect at the job site regarding employment, passes, badges, smoking, fire prevention, environmental, health, safety, and conduct on the property; and
  3. the highest (most stringent) applicable industry standards concerning the preservation of life, health, and safety of persons and property in the performance of the work shall apply.
- B. Failure by CM to comply with the requirements of this clause, including the failure to enforce its requirements on its employees, agents, subcontractors, and suppliers, and their respective employees, agents, sub-subcontractors and suppliers, regardless of tier, shall be considered a material breach of the Agreement. Failure to comply with safety and security requirements is cause for work stoppage and termination of personnel from the project. Repeated and/or willful violations are cause for termination of the contract.

#### **3.0 SAFETY**

- A. The CM shall:

1. receive and acknowledge Owner's contractor safety rules and regulations for the project's operating site (if applicable). Furthermore the CM will review these safety rules with its employees, agents, subcontractors and suppliers, and their respective employees, agents, sub-subcontractors, and suppliers, regardless of tier, including those affecting life, health, and safety of persons and property.
2. provide a site-specific EHS plan that addresses the identification of site hazards inclusive of a mitigation plan to address those hazards. The CM shall also request and receive a similar site-specific EHS plan from their subcontractors.
3. take all necessary precautions for the safety of all persons and property on the Project;
4. erect and properly maintain at all times, as required by job conditions and progress of the work, all necessary safeguards for the protection of the workmen and the public;
5. post danger signs warning against the hazards created by such features of construction as protruding nails, bad hoists, well holes, hatchways, scaffolding, window openings, stairways, dangers from falling materials, etc.;
6. not load or permit any part of the Work to be loaded so as to endanger its safety; and
7. shall designate a responsible member of his organization on the worksite whose duty shall include the prevention of accidents.

In any emergency affecting the safety of persons or property, CM shall act, at CM's discretion, to prevent threatened damage, injury or loss. Any additional compensation or extension of time claimed by the CM on account of such emergency work shall be determined by agreement of the parties.

By executing this Agreement, CM warrants and certifies to Owner that its employees, its subcontractors' employees, and all persons employed by or through CM pursuant to this Agreement, have been properly trained in safety procedures associated with their trade and construction in general.

1. CM shall request and keep on file at the project site all EHS training documentation of its employees, agents, subcontractors and suppliers, and their respective employees, agents, sub-subcontractors, and suppliers, regardless of tier.

CM further warrants and certifies that it shall exercise due diligence and care in the supervision of the personnel so employed, to ensure that such safety procedures and practices are properly observed at all times during execution of the Work.

#### **4.0 SUPERVISION AND DISCIPLINE**

- A. The CM shall provide a competent Superintendent who is authorized to act for him and has been approved by the Owner. Such Superintendent shall be on the Project site at all times when Work is being performed. CM shall be solely responsible for all construction means, methods, techniques, sequences and procedures, and for supervising the work of the subcontractors and materialmen and coordinating all portions of the Work.

CM shall at all times enforce discipline and good order among all persons employed on the Project by himself and his subcontractors and materialmen and he shall not employ nor allow anyone to employ on the Project any unfit person, anyone not skilled in the work assigned to them, nor anyone who fails or refuses to adhere to safety requirements in effect at the jobsite.

## **5.0 USE OF THE SITE**

- A. The CM shall confine operations at the site to areas permitted by law, ordinances, permits, and the Contract, and shall not unreasonably encumber the site with any materials or equipment.
- B. The CM shall keep the job site and adjoining premises clean at all times of rubbish caused by him or his subcontractors, and at the completion of Work shall remove all rubbish, tools, equipment, surplus material and temporary structures and installations, leaving the premises clean and ready for use.

## **6.0 SUBCONTRACTED WORK**

- A. The CM may perform such portions of the Work with his own forces as his qualifications and experience shall permit. Prior to the award of any subcontract, the CM agrees to obtain pre-qualification information from the proposed subcontractor, and to submit for Owner's review, such subcontractor's environmental, health and safety history and training records.
- B. The CM shall remain primarily responsible and liable for performance of the entire Work, regardless of whether the Owner has given approval or consent to a particular subcontractor, subcontract or any other matter in connection with either.

## **7.0 MINIMUM OWNERS REQUIREMENTS**

The CM agrees to document all findings (hazardous conditions and hazardous acts) through the performance of daily inspections. Findings must be corrected and tracked to closure within 24 hours. The system(s) used for tracking must be able to trend the data.

All accidents and near misses must be reported to the Owner's Project Manager and EHS Manager immediately. Accident investigation reports must also be submitted and an accident/incident log kept for each project.

The CM agrees to develop/review a Task Hazard Analysis (mitigation plan) for all Construction Manager High Risk Operations as described in the attached *Owner's Construction/ Renovation EHS Requirements*.

Owner's EHS team may audit the site and may require access to all CM EHS files to measure conformance with this agreement. The CM agrees to correct all audit deficiencies within the specified time noted in the audit.

The CM will provide a monthly safety highlight report to the Owner's Project Manager and EHS Program Manager indicating field man-hours worked each month sorted by contractor and subcontractors of all tiers, recordable and lost time accidents, incidence rates and EHS highlights. A sample report is included in the *Owner's Construction/Renovation EHS Requirements*.

Prior to erecting, installing, constructing, repairing, adjusting, inspecting, operating, or maintaining any equipment or process where unexpected energization, start up, or release of hazardous energy sources will be isolated, locked and tagged out (e.g. electrical, pneumatic, hydraulic, gravity, electrical storage devices, capacitors, springs, and other mechanical). The CM must implement procedures that provide equal to or better than the General Electric LOTO program. **These procedures must be reviewed by authorized Owner's personnel before work commences.**

## **8.0 WORKMANSHIP**

The CM shall perform the Work in a good workmanlike manner and in strict accordance with the Contract and complete the Project in a professional and timely manner. The CM will be responsible to the Owner for the acts and omissions of all of his employees and all subcontractors, their agents and employees, and all other persons performing any of the Work under a contract with the CM.

## **9.0 CORRECTION BY OWNER; SUSPENSION OF WORK**

In the event that the CM shall fail to prosecute the Work in accordance with the Contract, or shall otherwise default thereunder, the Owner may, without terminating the Contract and without prejudice to any other remedy he might have, order the immediate suspension of the work, terminate the Contract, or cure said default at the expense of the CM following written notice thereof.

## **10.0 INDEPENDENT CONTRACTOR**

CM is and shall remain for all purposes an independent contractor, and he shall have no power, nor shall he represent that he has any power, to bind Owner or to assume or create any obligation, expressed or implied, on behalf of Owner.

# **OWNER'S CONSTRUCTION/RENOVATION EHS REQUIREMENTS**

## **PERSONAL PROTECTIVE EQUIPMENT**

- Hard Hats are required at all times in the construction work area.
- Appropriate eye and face protection that complies with ANSI Z87 shall be worn at all times. Safety glasses with side shields are required as a minimum.
- Sensible and safe work clothing/shoes must be worn. This means the wearing of shirts with a minimum 4" sleeve.
- Shorts, cutoffs, sleeveless shirts, tank tops, sneakers and running shoes are strictly prohibited.
- At a minimum, substantial shoes must be worn on all project sites. No canvas or leather sneakers (even if equipped with steel toe) or sandals will be worn. All construction boots or shoes designed to accommodate laces must be fully laced.
- Appropriate hearing protection shall be worn in work areas where levels exceed established standards.
- Suitable gloves must be worn to protect the hands from injury as appropriate for the work to be performed.
- Approved respirators must be used when excessive dust, mist, fumes, gases or other atmospheric impurities are present.
- Safety harnesses and secured safety lanyards or retractable lifelines must be used when working from unguarded work surfaces where falls greater than 6 feet/1.8m present a hazard. (NOTE: Site requirements may limit this potential fall length to 4 feet/1.2m) Lanyards or retractable lifelines must be secured to separate lifelines and independent connection points capable of withstanding the load of a potential fall.
- Proper personal protective equipment must be worn for welding and burning.
- Welding screens must be used when welding operations are in the vicinity of other employees.
- Electric insulating protective equipment, such as rubber gloves, blankets, hoses, boots, etc. Shall be inspected before use.
- High visibility warning vests or other suitable garments marked with or made of reflectorized or high-visibility material must be worn when working in roadways or around heavy excavating equipment.

## **GENERAL SAFETY & SECURITY GUIDELINES**

- Alcoholic beverages, recreational drugs and people under the influence of these substances are not permitted on site.
- Weapons and firearms are strictly prohibited.
- No food or drink will be allowed in the construction work area except in the designated eating area.

- Music radios/headsets are prohibited.
- No cameras or video equipment are permitted on site except as necessary to document the progress of the Work and as may be allowed under the specific Site Security guidelines.
- Smoking is not permitted in any building (including the building footprint and roof). Smoking is allowed in designated areas only.
- Horseplay and fighting is prohibited.
- Barricaded or roped off areas are considered danger zones and should be respected as such. Admittance to such areas is prohibited without authorization.
- Protect floor openings by providing adequate barricades and secured covers. All covers must be painted with high-visibility paint or shall be marked with the word “HOLE” or “COVER” to provide warning of the hazard.
- No one will be allowed to enter the site without proper identification. All trade workers, vendors, and visitors must comply with the Owner’s badge and access program.
- Do not prop exit doors.
- Throwing or dropping materials from one level to another is prohibited.
- No toxic chemicals or other types of pollutants may be disposed of in the on-site sewerage systems, either storm or sanitary.
- All gas cans and other liquid chemicals must remain in secondary containment devices.
- No riding in the back of pick-up trucks.
- Park in designated contractor-parking areas.
- The driver of any motor vehicle on company property is responsible for its safe condition and use. The vehicle owner must promptly correct any malfunction of brakes, lights, horn, or exhaust system. The driver is required to have a valid driver’s license and the vehicle must have a valid license plate. All traffic rules must be obeyed and pedestrians have the right of way at the Owner’s site.
- All deliveries and use of special equipment will be through areas designated by the Owner. The Owner’s facility has minimal staging and storage areas designated for construction use. All contractors must schedule and coordinate deliveries in order to minimize the necessity of storing materials prior to installation.
- Area and personal air monitoring required by federal, state or local regulations shall be the responsibility of the CM.

### **HOUSEKEEPING**

- Cleanliness and orderliness are the first fundamentals of good housekeeping.
- Contractors are responsible for cleaning up and removing hazardous and non-hazardous waste generated on site.

- Each Contractor shall be responsible to maintain areas where he is performing work free from waste materials, debris and rubbish. Work will not be considered complete until all waste materials are removed and the work area returned to a clean and orderly condition. Waste material must be disposed of off-site.
- All protruding nails in form lumber, boards, etc., must be withdrawn or bent into the wood before the wood is stacked or piled.
- Rags, packing materials, paper cups, and sawdust in saw areas must be collected daily and placed in proper containers.
- All objects with sharp edges (scrap sheet metal, scrap glass, bottles, metal cans) shall be collected daily and placed in containers.
- Avoid placing debris and other obstacles in roadways, walkways, aisles and other travel routes.
- Allow sufficient time at the end of each day for proper cleanup of the work area. Place all debris in proper refuse containers.
- All stored material must be kept in an orderly manner at all times.
- Provide a proper collection container and floor protection when using cutting oil, solder flux, hydraulic oil, and other fluids.
- In the event of a large spill, immediately install acceptable containment barriers.

## **LADDERS**

- The use of metal and wood ladders is prohibited. All ladders shall be heavy duty, industrial strength. The use of fiberglass, or aluminum/fiberglass composite ladders is acceptable. Job-made wooden ladders shall only be allowed upon approval from the Owner's EHS Program Manager.
- Stepladders must be fully open. They cannot be used as straight ladders.
- Tie-off all straight and extension ladders to keep them secure. Straight and extension ladders must extend three feet (3') beyond the top landing. The base of the ladder shall be set out at least one-fourth of the ladder height measured from bottom to point of bearing.
- Any ladder found defective shall be removed from service and destroyed (vertically) or repaired to original specifications.
- Do not place ladders in blind spots (doorways, driveways) or in egress ways unless properly barricaded or guarded.

## **TOOLS & EQUIPMENT**

- Defective tools and equipment must be taken out of service and shall be properly repaired before reuse.
- Machinery, tools (including portable grinders and buffers) and equipment with exposed gears, belts, power transmission, couplings, etc. shall not be operated without effective guards in place.

- The use of gasoline and propane powered equipment in the building is strictly prohibited.
- A motor vehicle engine shall not be left running if the vehicle/equipment is unattended unless it is necessary in the normal operational requirement of the unit. Unattended means that the operator has left the normal control position of the vehicle.
- All moving equipment must be equipped with back-up alarms.
- Store or stack equipment and material so that it will not create a falling or tripping hazard or block access to fire extinguishers or emergency exits.

### **COMPRESSED GAS CYLINDERS**

- Defective tools and equipment must be taken out of service and shall be properly repaired before reuse.
- To avoid accidental displacement, keep compressed gas cylinders standing and securely tied off, whether empty or full. Make sure valve protection caps are on when cylinders are not in use. The valve shall be closed on all empty cylinders.
- When moving cylinders by crane or derrick, a cradle, boat or suitable platform shall be used. Slings or hooks shall not be used.
- When cylinders are not in use, they must be secured and capped.
- If cylinders are not used within a 24-hour period, they are considered to be in storage, and must be secured, capped and separated. Separate oxygen and fuel gas cylinders by a minimum of 20' or a 5' high, ½ hour fire-rated barrier.

### **FIRE PREVENTION**

- Use only approved cleaning agents — never gasoline or flammable liquids.
- Gasoline and similar flammable liquids must be stored only in approved safety containers and in areas free of burning hazards.
- Keep all heat sources from flammable liquids, gases or other combustible materials.
- Open fires are strictly prohibited.
- Every hot work operation must have a properly trained and equipped fire watch with appropriate fire extinguishers for the specific hazard in the work area. The fire watch must remain in the work area for at least 30 minutes after the hot work activity is completed.

### **FALL PROTECTION**

All workers in an area exposed to a fall greater than 6 feet (1.8m) must use appropriate fall protection. Such protection includes:

- Guardrail systems
- Safety net systems
- Personal fall arrest systems

Other protection methods include:

- Controlled access zones
- Controlled decking zones
- Hole covers
- Positioning device systems
- Equipment guards
- Fences and barricades
- Warning line systems in combination with guardrail systems, safety net systems, personal fall arrest systems or safety monitoring systems.

**Exception:** When the employer demonstrates that it is infeasible or creates a greater hazard to use these systems, a fall protection plan that meets the OSHA requirements must be developed for review and implemented.

Fall protection is required but not limited to the following when a worker is exposed to a fall of six feet (1.8m) or more:

- Performing steel erection work
- Working on scaffolds
- Unprotected sides and edges
- Overhand bricklaying and related work
- Leading edges
- Roofing work on low-slope roofs
- Hoist areas
- Steep roofs
- Holes
- Precast concrete erection
- Formwork and reinforcing steel
- Wall openings
- Ramps, runways and other walkways
- Walking/working surfaces
- Excavations
- Aerial lifts
- Dangerous equipment
- Metal decking operations
- Erecting, dismantling and working on scaffolds

The provisions in this section do not apply when:

- Employees are making an inspection, investigation or assessment of workplace conditions prior to the actual start of work or after all construction work has been completed
- Working on certain cranes and derricks
- Working on certain types of equipment used in tunneling operations
- Engaged in the construction of electric transmission and distribution lines and equipment
- Working on stairways and ladders
- Tradespeople shall not stand on motors, pumps, conduits or the like to gain access to elevated work.
- Use of Safety Monitor System (SMS), Controlled Access Zone (CAZ), or Controlled Decking Zone (CDZ) will not be accepted unless prior approval from Owner's EHS Program Manager has been received.
- Working on a roof within six (6) feet (1.8m) of the edge or a floor opening requires appropriate fall protection (guardrail systems, safety net systems, or personal fall arrest systems). Use of a safety monitor system or controlled access zone will not be accepted without prior approval from Owner's EHS Program Manager.
- Safety harnesses must be worn at all times in scissors and personnel lifts. Chains must be closed. Harnesses must be secured to an approved tie-off point when breaking the plain of the lift.
- Safety harnesses must be secured to an approved tie-off point in all aerial lifts.
- Establish a barricaded or roped off danger zone around lifts for falling objects.

Hoisting of personnel on a personnel platform by a crane or derrick is prohibited, except when the erection, use, and dismantling of conventional means of reaching the worksite, such as a personnel hoist, ladder, stairway, aerial lift, elevating work platform or scaffold, would be more hazardous or is not possible because of structural design or worksite conditions. This type of operation must meet the requirements of OSHA 1926.550(g).

Workers must wear a safety harness with his/hers safety lanyard secured to a separate lifeline while working from swing scaffolds, boatswain's chairs, or other suspended work platforms where a fall hazard is present.

CM's written Fall Protection Program - CM must develop a written Fall Protection Program and it must be communicated to all affected employees. The program will contain the following elements:

- Hazard identification
- Selection of fall hazard control
- Equipment inspection and maintenance
- Employee training

CM must conduct a fall hazard assessment to address both routine ongoing activities and tasks as well temporary activities, which may take place during maintenance and construction.

Control measures will be identified, implemented and communicated by the CM. Documentation of fall hazard control measures should be included in THAs, safe work plans or other operating procedures.

CM workers must be trained in the requirements of the fall protection program including use of fall protection equipment as appropriate.

Contractors must inspect and maintain fall protection equipment in accordance with manufacturer's recommendations.

## **SCAFFOLDING**

- All scaffolds must be inspected before use and must be designed for the safe working load.
- Only scaffold planking tested and approved to carry the load may be used. Scaffold planking must be secured by tying or cleats to prevent slipping. Mark scaffold planks (in most cases the manufacturer does this) and use only on scaffolds.
- Handrails and toeboards shall be used on all scaffolds and the scaffold secured as required.
- Rolling tower scaffolds must be locked while the scaffold is in use. Tower must be free of personnel, material and equipment before being moved. Rolling scaffolds are not to be moved from the top.
- Ladders must be used for accessing scaffolds. Climbing of bracing is prohibited.
- Scaffold platforms more than 6 feet (1.8m) above any working surface must be equipped with a guardrail system—
- Top rails (42" (1.1m) plus or minus 3" (8cm), mid rails (midway between the top rail and the scaffold platform) and toe boards or personal fall arrest systems must be implemented.
- No scaffold shall be erected, moved, dismantled or altered except by trained and qualified personnel under the authority of the competent person.
- Abide by the Scaffold Tag System
  - *GREEN*—complete scaffold per required safety standards.
  - *YELLOW*—conditional use—100% fall protection required.
  - *RED*—Scaffold not complete. Do Not Use.
- Makeshift platforms, such as stacked materials, chairs, boxes, or drums shall not be used.
- Scaffolds shall be built to OSHA standards (1926.451).
- **Tubular Welded Frame Scaffolds have additional special safety requirements:**

- Scaffold legs shall be set on adjustable bases, plain bases or other foundations adequate to support the maximum rated load.
- To prevent movement, the scaffold shall be secured to the building or structure at intervals not to exceed 30 feet (9.1m) horizontally and 26 feet (7.9m) vertically.
- All pins to secure diagonal braces and to prevent uplift shall be used.
- **Outriggers and platforms below the working/walking level shall be fully planked.** Outriggers shall be tied to the frame.
- Scaffolds may not be used as material hoist towers or for mounting derricks without first determining the loads and stress involved.
- All scaffolds shall be free of tools, trash, etc. before calling in for removal.

### **CRANES, HOISTS & RIGGING**

- Never raise a load over people or occupied buildings.
- **Tag lines must be used to control every load.**
- Rigging operations utilizing chains is not permitted without prior approval from Owner EHS Program Manager.
- Multiple-lift rigging is strictly prohibited.
- All materials shall be rigged to prevent unintentional displacement. **Hooks with self-closing safety latches shall be used** to prevent components from slipping out of the hook.
- Defective rigging equipment shall be tagged and removed from service.
- Only qualified operators may operate power equipment. Seat belts must be worn wear applicable.
- Cranes and Hoists
- Safe lifting procedures for cranes and hoists must be developed and documented.
- Crane and hoist operators and qualified riggers must conduct rigging equipment inspections prior to each use on each shift and as necessary during its use to ensure that it is safe.
- All operators of cranes and hoists should have received training that addresses safe operating practices for all crane types that they will be operating on site.
- Preventative maintenance must be conducted on cranes and hoists in accordance with manufacturer's guidance or local regulatory requirements.
- Contractors must submit copies of detailed and documented annual inspections conducted by qualified individuals.
- Riding on hooks, headache balls or slings of hoisting equipment is strictly prohibited.

## **ELECTRICAL**

- Electrical equipment shall not be installed, repaired, or removed except by trained qualified electricians.
- Electrically operated equipment (stationary and portable) must be grounded.
- When extension cords, power tools or equipment cords are frayed or worn, or when bare wire is showing, the equipment must be tagged and taken out of service.
- Do not use electrical tape on extension cords.
- Temporary cords should be supported a minimum of 8' above the floor in egress walkways, corridors and areas requiring employee access.
- Temporary lighting must be guarded.
- All 120-volt, single phase 15 and 20-ampere receptacle outlets on construction sites, which are not a part of the permanent wiring of the building or structure and are in use by employees, shall have approved Ground Fault Circuit Interruption (GFCI) for personnel protection. When using the permanent receptacles, GFCI devices must be installed on each extension cord prior to the source receptacle.
- Lock-out/Tag-out programs represent a lifesaving control. Compliance with Owner's procedures is mandatory.
- Equipment-specific energy control procedures are required for all lock-out/ tag-out operations.
- Extension cords must be at least 16-gauge heavy duty 3—wire with a UL approved three prong grounded plug.
- 110-volt outlets on portable generators and welders shall be 3-way (NEMA 5-15R) grounded to the frame. The power lead shall be connected through a Ground Fault Circuit Interrupter.

## **CONTRACTOR HIGH RISK OPERATIONS/HIGH HAZARD ACTIVITIES**

All major construction activities on this project must be carefully analyzed to determine appropriate safety controls to ensure worker safety and health in accordance with Federal, State, and local regulations and Owner compliance. Reviewing the construction activities prior to the CM's arrival on site or the start of any special construction activity allows all parties to plan for safety.

Work that has a high risk of resulting in a serious worker exposure, injury, or death or an environmental violation is considered a high-risk operation. A Task Hazard Analysis or Mitigation Plan is a procedure which identifies potential hazards specific to a scope of work or activity and defines actions required by specifying locations, safety precautions, activities involved and the work sequencing so that the operation will take place in the safest manner possible. A Task Hazard Analysis or Mitigation Plan will be required for, but not limited to, all of the following activities: Operations involving the shut-down and start-up of fire alarm systems, fire protection systems and sprinkler systems in occupied facilities, operations involving shut down and start-up of process piping, electrical systems, hydraulic systems and elevators/escalators; trenches and excavations greater than 5 feet in depth or that require a

shoring system; elevated work activities including work on a roof or major scaffold; work to be performed on existing equipment; installation or removal of equipment or machinery, work involving existing piping, vents, or drains, piping tie-ins and line breaking; any hazardous painting, floor or wall coating (epoxy paints, electro-static painting, cocooning); asbestos abatement; working on/with lead containing materials; demolition work; structural steel erection; major scaffold erection; use of ladders above 24 feet; elevated work requiring the use of fall protection; hot work (welding, cutting, brazing) in hazardous areas or near hazardous materials; passivation; confined space entry; control of hazardous energy and line breaking (lock out/tag out); any activity which will impede a sidewalk, roadway, or building entrance (in occupied facilities or public areas); crane and/or hoist operations; Critical lifts (defined as any lift meeting one of the following four criteria) - lifts which exceed 75% of the cranes rated capacity or other lifting equipment configuration, lifts that require the use of more than one crane or in combination with other lifting equipment approved for hoisting or rigging purpose, lifts which are located in an area or areas where conditions present exposures to electrical hazards, underground hazards, overhead piping systems, vessels, operational buildings, etc., lifts of equipment which are identified as specialized equipment, "one of a kind" which has been designed, engineered and fabricated for a specific process of the owner. This will include equipment specified by the owner such as glass-lined reactors, vessels, etc.; and any other unusual activity that may require review of the tasks and hazards involved.

A Task Hazard Analysis/Mitigation Plan must be documented by the CM/Subcontractor to ensure a safe working environment. Procedures regarding work permits (where applicable) should be defined in the THA.

All attachments (training documents, crane location plans, crane swing radius information, Material Safety Data Sheets, etc.) must be included with the mitigation plan submission. The THA must be submitted to the Owner for review a minimum of 48 hours prior to the scheduled operation.

The CM's competent person must review the Task Hazard Analysis with the work crew prior to the commencement of the activity and on a daily basis or as conditions (such as weather) change.

Reference guidance document *Task Hazard Analysis Framework for Contractor High Risk Operations* located on GE Corporate Contractor Safety Support Central.

## **LOCK OUT TAG OUT**

The LOTO standard applies, but is not limited to activities that are performed on a machine, a piece of equipment, a process, or circuit. Primary, secondary, stored and single source energy sources require a lockout when performing servicing and/or maintenance activities. Primary energy sources are the main energy sources such as electricity, gas, fluids, etc., provided to machines, equipment, processes and circuits. Shut down machinery with moving parts or process equipment in service before adjustments or repairs. Owner's LOTO procedures must be followed.

If shut down is not feasible a risk assessment must be used. The risk assessment explores the safest conditions possible for individual work assignments. Risk assessment establishes safe

practices and alternative methods to reduce the possibility of injury when normal LOTO procedures cannot be applied. A task hazard analysis (mitigation plan) and written procedures specific for the job must be completed and reviewed with Owner prior to start.

Never remove warning or danger tags or locks on any apparatus, valves or switches unless you have been instructed to do so, and then only by the persons who attached them.

Contractors who are involved with equipment/systems and are potentially exposed must implement procedures that provide protection equal to or better than the General Electric LOTO program. LOTO programs for outside services or contractors must be reviewed by authorized General Electric personnel.

The contractor supervisor must be made aware of the overall LOTO procedure and informed of the equipment specific procedure by an Owner Authorized Representative.

Contractors must place their own locks and tags (one lock, one key, one person) and verify LOTO by try-out. As a best practice, the Owner's Authorized Representative may perform the LOTO step-by-step process. The contractor will then be required to attach and secure their individual LOTO locks and red tags to the same energy-isolating devices that the Owner representative has locked out.

All Contractor workers involved in a LOTO operation must have documentation of LOTO training. This documentation must be available for audit at the work site.

### **CONFINED SPACE**

A confined space is an enclosed area that has each of the following four characteristics:  
1) Large enough and so configured that an worker can bodily enter and perform assigned work,  
2) Has limited means for worker entry and exit due to the number, size, or location of openings,  
3) Is not designed for continuous worker occupancy, 4) Contains or may contain a serious safety or health hazard. Such hazards include currently or potentially hazardous atmospheres, potential worker entrapment (from inwardly converging walls or downward sloping floor), or potential worker engulfed by stored materials. Examples of confined spaces include tanks, vessels, pits, sewers, pipelines, boilers and utility vaults.

Entry into a confined space shall be conducted only if necessary to do assigned work. Whenever possible, assigned work shall be completed from outside the space.

Entry into a confined space is prohibited until atmospheric testing of the space and applicable entry procedures have been documented and permits completed.

All Contractor entrants and attendants must have documentation of confined space entry/attendant training.

Additional respiratory protection training and documentation will be required (if respiratory protection is needed).

This documentation must be available for audit at the work site.

All entrants and attendants must be informed of the entry procedures and mitigation plan prior to the entry.

The use of retrieval equipment is required for all confined space entries. The number of entrants must be equal to the number attendants and to the number of retrieval devices available.

## **STRUCTURAL STEEL ERECTION**

The safety standards for structural steel erection will follow the OSHA regulations for Steel Erection Subpart R (1926.750-1926.761 inclusive of Appendices A-H) dated January 18, 2001 and revised on July 18, 2001 with the following exceptions and additions:

All workers including connectors and deckers must be protected from falls at or greater than six (6) feet (1.8m).

Multiple lift rigging procedures (Christmastreeing) is strictly prohibited.

The use of a Controlled Decking Zone (CDZ) is prohibited.

Cranes used in steel erection activities shall be visually inspected prior to each shift by a competent person. The inspection must include observation for deficiencies during operation. The inspection must be written and a copy submitted to Owner daily. Deficiencies constituting a hazard require that the hoisting equipment be removed from service until the deficiency is corrected.

At the end of the shift or when environmental or jobsite conditions require, metal decking must be secured against displacement.

Metal decking must be laid tightly and immediately secured upon placement to prevent accidental movement or displacement.

Wire mesh, exterior plywood or equivalent must be installed around columns where planks or metal decking do not fit tightly. The materials used must provide fall protection for personnel and prevent objects from falling through.

All columns must be anchored by a minimum of four (4) anchor bolts.

Anchor bolts should not be repaired, replaced or field modified without the approval of the project structural engineer of record.

## **WRITTEN PROGRAMS**

The CM must submit a site-specific Health and Safety Plan for each project location that includes all Owner and any other Stakeholder's EHS requirements.

The CM must submit a **Disciplinary Program** for review by Owner.

The CM must have a **Written Hazard Communication Program** on site inclusive of a Chemical Inventory List and Material Safety Data Sheets (MSDS) for all chemicals brought to the site.

An **Evacuation Plan** inclusive of a designated muster area must be put in place for the project. Evacuation drills and alarm testing may occur periodically.

The CM must submit LOTO and Confined Space Plans (if applicable)

## **REQUIRED REPORTS**

The following reports must be submitted to Owner as noted:

**MONTHLY SAFETY HIGHLIGHT REPORT** – This report must include field man-hours monthly and cumulatively for each project, incidence rates (TCIR and DART), incidence rate charts, accident/incident log summary, and project EHS highlights. *See attached sample report.*

**MONTHLY ACCIDENT/INCIDENT SUMMARY LOG** – This log must include the date of any accident/incident, a description of the accident, specific injuries and treatment (if applicable), Contractor involved, injured worker's name (if applicable), type of accident (recordable, lost time, number of lost workdays and number of restricted days or job transfer) near miss, first aid, etc.), and comments indicating how the same or a similar accident will be prevented from recurring.

**SAFETY VIOLATION LOG** – A spreadsheet that is updated as required and forwarded to Owner monthly indicating the time of the violation, location of the violation, violator's name, company, supervisor's name, type of violation, person who issued the violation, warning #/termination, and comments.

**SAFETY OBSERVATION LOG/PROCESS** – A process to document **all EHS observations** with a method to **track to completion** that includes a **sorting mechanism**. **The log must be completed daily and forwarded to Owner weekly.** Process should include the following information: Date of the observation, Description of the observation, Observation type (electrical, ladder, etc.), Location, Contractor, and Date that the observation was corrected.

**SAMPLE**

**MONTHLY SAFETY HIGHLIGHT REPORT**

**Safety Overview – January 2005**

To date the \_\_\_\_\_ project has worked \_\_\_\_\_ man-hours with \_\_\_\_\_ OSHA recordable cases, one of which had \_\_\_\_\_ days of restricted or lost work activity.

The project-to-date safety statistics for the \_\_\_\_\_ project are:

<b>CATEGORY</b>	<b><sup>1</sup>NATIONAL AVERAGE</b>	<b>ACTUAL</b>
Total OSHA Recordable Cases	6.1	0
Incidence Rate (TCIR)		
DART Incidence Rate	3.1	0
(Recordable Cases with Days Away from Work, Days of Restricted Work Activity or Job Transfer)		
During January 2005 there were:		
Zero (0) OSHA Recordable Cases		
Zero (0) Recordable Cases with Days Away from Work, Days of Restricted Work Activity or Job Transfer		
Zero (0) Lost Workdays		
Zero (0) Restricted Workdays		
Zero (0) First Aid Cases		
Zero (0) Incidents/Other		
Zero (0) Near Misses		

In January 2005, \_\_\_\_\_ man-hours were worked on this project bringing the project-to-date total to \_\_\_\_\_ man-hours.

Describe any accidents/incidents that occurred during the month here.

This month, \_\_\_\_\_ contractor workers and \_\_\_\_\_ Owner employees attended the site-specific safety orientation on the project. To date, \_\_\_\_\_ contractor workers and \_\_\_\_\_ Owner employees have attended this project safety orientation. This continues to be an excellent venue for explaining the team approach and jobsite safety rules for the project.

Describe % of observations corrected in 24 hours, overview of trends of findings, EHS issues and any other EHS process improvements here.

Attached are graphs indicating our project-to-date safety status as compared to the National Average for the Construction Industry.

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<sup>1</sup> 2002 Bureau of Labor Statistics for Nonresidential Building Construction, SIC Code 154

# **RA HEALTH AND SAFETY PLAN**

## **APPENDIX C**

### **EXAMPLE OF A DIVING SAFETY MANUAL FOR SCIENTIFIC DIVING**

**DIVING SAFETY MANUAL  
FOR SCIENTIFIC DIVING**

# Table of Contents

<b>Section 1. General Policy .....</b>	<b>1</b>
1.1 Diving Standards.....	1
1.1.1 Purpose .....	1
1.1.2 Diving Definition .....	1
1.1.3 Diving Exemption .....	1
1.2 Operational .....	1
1.2.1 Scientific Diving Standards and Safety Manual .....	1
1.2.2 Diving Safety Officer .....	1
1.2.3 Diving Supervisor .....	2
1.2.4 Lead Diver.....	2
1.2.5 Waiver of Requirements .....	3
1.2.5.1 Consequence of Violation of Regulations by Scientific Divers .....	3
1.3 Record Maintenance .....	3
<b>Section 2. Diving Procedures .....</b>	<b>3</b>
2.1 Introduction .....	3
2.2 Pre-Dive Procedures .....	4
2.2.1 Dive Plans .....	4
2.2.2 Pre-Dive Safety Checks.....	4
2.3 Diving Procedures.....	5
2.3.1 Solo Diving Prohibition.....	5
2.3.2 Decision to Dive .....	5
2.3.3 Termination of Dive.....	5
2.3.4 Emergencies and Deviations from Regulations.....	5
2.3.5 Diving From Vessels .....	5
2.3.6 Safety Stops .....	6
2.4 Post-Dive Procedures .....	6
2.5 Emergency Procedures.....	6
2.6 Flying After Diving.....	6
2.7 Recordkeeping and Requirements .....	6
2.7.1 Personal Diving Log .....	6
2.7.2 Required Incident Reporting .....	7
<b>Section 3. Diving Equipment .....</b>	<b>7</b>
3.1 General Policy.....	7
3.2 Equipment.....	7
3.2.1 Regulators.....	7
3.2.2 Breathing Masks and Helmets.....	7
3.2.3 Scuba Cylinders .....	8
3.2.4 Gauges .....	8
3.2.5 Flotation Devices .....	8
3.2.6 Timing Devices, Depth and Pressure Gauges .....	8
3.2.7 Determination of Decompression Status: Dive Tables, Dive Computers .....	8
3.3 Auxiliary Equipment .....	8
3.3.1 Handheld Underwater Power Tools or Sampling Devices .....	8
3.4 Support Equipment .....	9

3.4.1 First-Aid Supplies .....	9
3.4.2 Diver's Flag .....	9
3.5 Air Quality Standards .....	9

**Section 4. Training Requirements ..... 9**

4.1 General .....	9
4.2 Evaluations.....	9
4.2.1 Medical Examination .....	9
4.2.2 Swimming Evaluation .....	10
4.3 Scuba Training.....	10
4.3.1 Practical Training .....	10
4.3.2 Written Examination.....	10
4.3.3 Open Water Evaluation.....	11

**Section 5. Medical Requirements ..... 12**

5.1 General .....	12
5.2 Frequency of Medical Evaluations.....	12
5.3 Information Provided to Examining Physician .....	12
5.4 Content of Medical Examinations .....	12
5.5 Restriction of Diving .....	12
5.6 Laboratory Requirements for Diving Medical Examination .....	13
5.7 Physician's Written Report .....	13

**Attachments**

- Attachment 1 Safe Ascent Recommendations
- Attachment 2 Diving Medical Exam Overview for the Examining Physician
- Attachment 3 Diving History
- Attachment 4 Diving Emergency Management Procedures
- Attachment 5 Medical Examination of Scientific Diver

# 1. GENERAL POLICY

## 1.1 DIVING STANDARDS

### 1.1.1 Purpose

The purpose of the Diving Standards is to confirm that all diving performed during activities covered by the *Remedial Action Health and Safety Plan* (RA HASP) for the Hudson River PCBs Superfund Site is conducted in a manner intended to protect divers from accidental injury and/or illness.

The American Academy of Underwater Sciences (AAUS) is recognized by OSHA as the scientific diving standard setting organization (refer to Attachment G for a list of safe ascent recommendations). The standards described in this document adhere to the AAUS standards where necessary and appropriate.

## 1.2 OPERATIONAL CONTROL

### 1.2.1 Diving Standards and Safety Manual

This *Diving Safety Manual* provides for the development and implementation of policies and procedures to meet the requirements of local environments and conditions, and comply with the AAUS scientific diving standards that are applicable to the types of diving conducted during activities covered by the RA HASP.

These diving standards must include:

- Emergency evacuation and medical treatment procedures.
- The criteria for diver training and certification.
- Standards written or adopted by reference for each diving mode utilized, which include the following:
  1. Safety procedures for the diving operation.
  2. Responsibilities of the dive team members.
  3. Equipment use and maintenance procedures.
  4. Emergency procedures.

### 1.2.2 Diving Safety Officer

The DSO serves as a member of the Diving Control Board (DCB). This person should have broad technical and scientific expertise in research-related diving.

The duties and responsibilities of the DSO include:

- Responsible, through the DCB, to the administrative officer or his/her designee for the conduct of the scientific diving program. The routine operational authority for this program, including the conduct of training and certification, approval of dive plans, maintenance of diving records, and ensuring compliance with this manual and all other relevant regulations, rests with the DSO.
- May permit portions of this program to be carried out by a qualified delegate, although the DSO may not delegate responsibility for the safe conduct of the local diving program.
- Guided in the performance of the required duties by the advice of the DCB, but operational responsibility for the conduct of the local diving program will be retained by the DSO.
- Suspending diving operations that he/she considers to be unsafe or unwise.

The necessary qualifications of the DSO include:

- Appointed by the responsible administrative officer or his/her designee, with the advice and counsel of the DCB.
- Trained as a scientific diver.

### 1.2.3 Diving Supervisor

The responsibilities of the Diving Supervisor include:

- Acting as the on-site representative of the DSO for scientific diving projects and diver training activities.
- Maintaining presence on all dives from vessels and all other dives which present unusual or difficult circumstances.
- Providing in-water supervision of individuals who hold a Diver-In-Training Permit.
- Coordinating with other known activities in the vicinity that are likely to interfere with diving operations.
- Verifying that all dive team members possess current certification and are qualified for the type of diving operation to be undertaken.
- Planning dives in accordance with Section 2.2.1 of this *Diving Safety Manual*.
- Verifying that safety and emergency equipment is in working order and at the dive site.
- Briefing the dive team members on:
  1. Dive objectives.
  2. Unusual hazards or environmental conditions likely to affect the safety of the diving operation.
  3. Modifications to diving or emergency procedures necessitated by the specific diving operation.
- Suspending diving operations if, in his/her opinion, conditions are not safe.
- Reporting to the DSO and DCB any physical problems or adverse physiological effects, including symptoms of pressure-related injuries.

The necessary qualifications of the Diving Supervisor include:

- Meet all qualification criteria for Scientific Diver as outlined in Sections 4 and 5 of this *Diving Safety Manual*.
- Completed a minimum of 100 hours of documented dive time (underwater).
- Hold current cardiopulmonary resuscitation (CPR) and first-aid certifications.
- Diving experience in a variety of conditions including cold water, current, low visibility, and from large and small vessels.
- Written recommendations from two supervisors, as applicable.

### 1.2.4 Lead Diver

The DSO or the Diving Supervisor must appoint one member of each dive team as the Lead Diver.

The responsibilities of the Lead Diver include:

- Responsible for the in-water coordination of the scientific effort and the safety of the team while underwater.

- May assume the on-site responsibilities of the Diving Supervisor when diving operations are conducted in protected or shallow areas (less than 10 meters), with currents less than 0.5 knots, and at the discretion of the DSO.

The necessary qualifications of the Lead Diver include:

- Hold a Scientific Diver certification; and
- Be experienced with the site, mode, and dive objectives.

### **1.2.5 Waiver of Requirements**

The organizational DCB may grant a waiver for specific requirements of training, examinations, depth certification, and minimum activity to maintain certification as a scuba diver for activities covered by the RA HASP.

#### **1.2.5.1 Consequence of Violation of Regulations by Scientific Divers**

Failure to comply with the regulations of this *Diving Safety Manual* may be cause for the revocation or restriction of the diver's scientific diving certificate by action of the DCB.

## **1.3 RECORD MAINTENANCE**

The DSO or his/her designee must maintain permanent records for each individual scientific diver certified. The file must include evidence of certification level, log sheets, results of current physical examination, waiver, reports of disciplinary actions by the DCB, and other pertinent information deemed necessary.

Concerning the availability of records:

- Medical records must be available to the attending physician of a diver or former diver when released in writing by the diver.
- Records and documents required by this standard must be retained by the organizational member for the following period:
  - Physician's written reports of medical examinations for dive team members: Maintained for 5 years.
  - Manual for diving safety: Current document maintained only.
  - Records of dive: Maintained for 1 year, with the exception of 5 years where there has been an incident of pressure-related injury.
  - Pressure-related injury assessment: Maintained for 5 years.
  - Equipment inspection and testing records: Current entry or tag maintained, or until equipment is withdrawn from service.

## **2. DIVING PROCEDURES**

### **2.1 INTRODUCTION**

No person shall engage in scientific diving operations unless he/she holds a current certification issued pursuant to the provisions of this *Diving Safety Manual*.

## **2.2 PRE-DIVE PROCEDURES**

### **2.2.1 Dive Plans**

Dives should be planned around the competency of the least experienced diver. Before conducting any diving operations during activities covered by the RA HASP, the Diving Supervisor for a proposed operation must formulate a *Dive Plan* that must be reviewed and approved by the DSO. The *Dive Plan* must include the following:

- Diver qualifications and the type of certificate or certification held by each diver.
- Emergency plan with the following information:
  1. Name, telephone number, and relationship of person to be contacted for each diver in the event of an emergency.
  2. Nearest operational recompression chamber via the Divers Alert Network.
  3. Nearest accessible hospital.
  4. Available means of transport.
- Approximate number of proposed dives.
- Location(s) of proposed dives.
- Estimated depth(s) and bottom time(s) anticipated.
- Decompression status and repetitive dive plans, if required.
- Proposed work, equipment, and boats to be employed.
- All potentially hazardous conditions.

### **2.2.2 Pre-Dive Safety Checks**

The diver's pre-dive responsibilities include the following:

- Conducting a functional check of his/her diving equipment in the presence of the diving buddy or tender.
- Refusing to dive if, in his/her judgment, conditions are unfavorable, or if he/she would be violating the precepts of his/her training, of this manual, or the organizational member's diving manual.
- No dive team member shall be required to be exposed to hyperbaric conditions against his/her will, except when necessary to prevent or treat a pressure-related injury.
- No dive team member shall be permitted to dive for the duration of any known condition which is likely to adversely affect the safety and health of the diver or other dive members.

In addition, the diver must complete the following evaluations:

- Equipment Evaluations
  1. Each diver must verify that his/her equipment is in proper working order and that the equipment is suitable for the type of diving operation.
  2. Each diver must have the capability of achieving and maintaining positive buoyancy.
- Site Evaluation
  1. The environmental conditions at the site will be evaluated.

## **2.3 DIVING PROCEDURES**

### **2.3.1 Solo Diving Prohibition**

All diving activities must assure adherence to the buddy system (two comparably equipped scuba divers in the water in constant communication) for scuba diving. This buddy system is based on mutual assistance, especially in the case of an emergency.

### **2.3.2 Decision to Dive**

When making a decision whether to dive or not, scientific divers should follow these guidelines:

- The decision to dive is that of the diver. A diver may refuse to dive, without fear of penalty, whenever he/she feels it is unsafe for them to make the dive.
- The ultimate responsibility for safety rests with the individual diver. It is the diver's responsibility and duty to refuse to dive if, in his/her judgment, conditions are unsafe or unfavorable, or if he/she would be violating the precepts of his/her training or the regulations in this manual.

### **2.3.3 Termination of Dive**

Upon terminating the dive, scientific divers should follow these guidelines:

- It is the responsibility of the diver to terminate the dive, without fear of penalty, whenever he/she feels it is unsafe to continue the dive, unless it compromises the safety of another diver already in the water.
- The dive must be terminated while there is still sufficient cylinder pressure to permit the diver to safely reach the surface, including decompression time, or to safely reach an additional air source at the decompression station.

### **2.3.4 Emergencies and Deviations from Regulations**

Any diver may deviate from the requirements of this manual to the extent necessary to prevent or control a situation which is likely to cause death, serious physical harm, or major environmental damage. A written report of such actions must be submitted to the DCB explaining the circumstances and justifications.

### **2.3.5 Diving From Vessels**

All diving from contractor-controlled vessels must be limited to the following individuals:

- Those persons certified as divers engaged in recognized diving projects for activities covered by the RA HASP.
- Those persons certified as divers engaged in training or certification activities as authorized by the DSO.
- Those persons who are contracted for diving services related to activities covered by the RA HASP.

In addition, the following guidelines apply to diving from vessels:

- All diving activities from vessels during activities covered by the RA HASP must be conducted under the direction of a Diving Supervisor. The Diving Supervisor will be responsible for all diving activities and will cooperate with the vessel captain to ensure the safety of all aboard.
- A designated Safety Diver must be on watch aboard vessels operating under the auspices of activities covered by the RA HASP when diving activities are being conducted. He/she will be fully dressed for immediate entry into the water. The support vessel will be deployed in the water ready for immediate use. One of the diving crew must be responsible for logging divers

on and off the vessel and maintaining dive records. It will be the responsibility of each diver to consult with this individual before entering the water to determine the time / depth limitations of the next dive.

- When diving activities are conducted from a small vessel, the minimum crew must consist of a boat operator and three divers, one of whom will serve as a Safety Diver while two are in the water. The boat operator will be responsible for recording dive times. One of the individuals on board must be a Diving Supervisor.
- When diving operations take place in protected waters near shore, at depths less than 10 meters, with currents less than 0.5 knots, and at the discretion of the DSO, the Safety Diver and boat operator functions may be carried out by one qualified individual. In addition, under these conditions, a designated Lead Diver may substitute for the Diving Supervisor.

### **2.3.6 Safety Stops**

The following guidelines apply to safety stops:

- The inclusion of a safety stop performed during the ascent phase of the dive is strongly recommended to minimize the formation of inert gas bubbles. Stops at 20 or 10 FSW (depending on surface swell heights) for at least 3 minutes should be part of the dive plan and air consumption calculations.
- Weighted lines to accommodate safety stops may be suspended from the stern of a vessel or be part of the anchor cable. Buoyed descent/ascent lines may be used provided there is enough scope to allow the buoy to move up and down with the swell. Note: Surfacing, then going back down for a safety stop negates any beneficial effect of the stop. Once on the surface, the diver must remain there.

## **2.4 POST-DIVE PROCEDURES**

After the completion of a dive, each diver must report any physical problems, symptoms of decompression sickness, or equipment malfunction.

## **2.5 EMERGENCY PROCEDURES**

Each organizational member must develop emergency procedures that follow the standards of care of the community and must include procedures for emergency care, recompression, and evacuation for each dive location.

## **2.6 FLYING AFTER DIVING**

Divers should have a minimum surface interval of 12 hours before ascending to altitude.

## **2.7 RECORDKEEPING AND REQUIREMENTS**

### **2.7.1 Personal Diving Log**

Each certified scientific diver must log every dive made during activities covered by the RA HASP and is encouraged to log all other dives. Log sheets must be submitted to the DSO to be placed in the diver's permanent file. Details of the submission procedures are left to the discretion of the DSO. The diving log must include at least the following:

- Name of diver, partner, and Diving Supervisor.
- Date, time, and location.
- Diving modes used.
- General nature of diving activities.
- Approximate surface and underwater conditions.

- Maximum depths, bottom time, and surface interval time.
- Diving tables or computers used.
- Detailed report of any near or actual incidents.

### **2.7.2 REQUIRED INCIDENT REPORTING**

All diving incidents requiring recompression treatment, or resulting in moderate or serious injury or death, must be reported to the DCB. The report will specify the circumstances of the incident and the extent of any injuries or illnesses. Additional information must meet the following reporting requirements:

- The DCB must record and report occupational injuries and illnesses in accordance with requirements of the appropriate Labor Code section.
- If pressure-related injuries are suspected, or if symptoms are evident, the following additional information must be recorded and retained by the DSO, with the record of the dive, for a period of 5 years:
  1. Name, address, phone numbers of the principal parties involved.
  2. Summary of experience of divers involved.
  3. Location, description of dive site, and description of conditions that led up to the incident.
  4. Description of symptoms, including depth and time of onset.
  5. Description and results of treatment.
  6. Disposition of case.
  7. Recommendations to avoid repetition of incident.
- The DCB will investigate any incident of pressure-related injury and prepare a report documenting its findings.

## **3. DIVING EQUIPMENT**

### **3.1 GENERAL POLICY**

All equipment must meet the standards as determined by the DSO and DCB. Equipment that is subjected to extreme usage under adverse conditions should require more frequent testing and maintenance. All equipment must be regularly examined by the diver using the equipment.

### **3.2 EQUIPMENT**

#### **3.2.1 Regulators**

Regulators will consist of a primary second stage, an alternate air source (such as an octopus second stage or redundant air supply), and a submersible pressure gauge. Only those makes and models specifically approved by the DSO and DCB must be used. Scuba regulators must be inspected and tested prior to first use and every 12 months thereafter.

#### **3.2.2 Breathing Masks and Helmets**

Breathing masks and helmets must have:

- A non-return valve at the attachment point between helmet or mask hose, which must close readily and positively;
- An exhaust valve; and

- A minimum ventilation rate capable of maintaining the diver at the dive depth.

### **3.2.3 Scuba Cylinders**

Scuba cylinders must be designed, constructed, and maintained in accordance with the applicable provisions of the Unfired Pressure Vessel Safety Orders. Other requirements of scuba cylinders include:

- Must be hydrostatically tested in accordance with DOT standards.
- Must have an internal inspection at intervals not to exceed 12 months.
- Valves must be functionally tested at intervals not to exceed 12 months.
- Backpacks without integrated flotation devices and weight systems must have a quick release device designed to permit jettisoning with a single motion from either hand.

### **3.2.4 Gauges**

Gauges must be inspected and tested before first use and every 12 months thereafter.

### **3.2.5 Flotation Devices**

Guidelines concerning the use of flotation devices include:

- Each diver must wear an approved buoyancy compensator regardless of the type of exposure suit employed.
- Personal flotation systems, buoyancy compensators, dry suits, or other variable volume buoyancy compensation devices must be equipped with an exhaust valve.
- These devices must be functionally inspected and tested at intervals not to exceed 12 months.

### **3.2.6 Timing Devices, Depth and Pressure Gauges**

Both members of the diving pair must have an underwater timing device and approved depth indicator.

### **3.2.7 Determination of Decompression Status: Dive Tables, Dive Computers**

A set of diving tables, approved by the DCB, must be available at the dive location. The National Association of Underwater Instructors (NAUI) Dive Tables must be employed on all dives. Exceptions must be by approval of the DCB.

Additionally, dive computers may be utilized in place of diving tables; these must be approved by the DCB.

## **3.3 AUXILIARY EQUIPMENT**

### **3.3.1 Handheld Underwater Power Tools or Sampling Devices**

Electrical tools and sampling equipment used underwater must be specifically approved for this purpose. The need for power tools will be emphasized in *Dive Plans* submitted to the DCB, and it is at the discretion of the DCB to either approve or deny diving operations involving this equipment. Electrical tools and equipment supplied with power from the surface must be de-energized before being placed into or retrieved from the water.

Handheld power tools must not be supplied with power from the dive location until requested by the diver.

### **3.4 SUPPORT EQUIPMENT**

#### **3.4.1 First-Aid Supplies**

A small first-aid kit for diving emergencies [purchased from the Diver Alert Network (DAN)] will be present for diving operations.

#### **3.4.2 Diver's Flag**

A diver's flag must be displayed prominently whenever diving is conducted under circumstances where required or where water traffic is probable.

### **3.5 AIR QUALITY STANDARDS**

Breathing air for scuba diving must meet the following specifications as set forth by the Compressed Gas Association (CGA Pamphlet G-7.1) and referenced in OSHA 29 CFR 1910.134.

<b>CGA Grade E Component Maximum</b>
Oxygen 20 - 22%/v
Carbon Monoxide 10 PPM/v
Carbon Dioxide 500 PPM/v
Condensed Hydrocarbons 5 mg/m <sup>3</sup>
Water Vapor NS
Objectionable Odors None

## **4. TRAINING REQUIREMENTS**

### **4.1 GENERAL**

An individual who is authorized to dive during activities covered by the RA HASP must be able to safely operate in an environment that may include below freezing air temperatures, near-freezing water temperatures, high currents, low to zero visibility, and rough seas. The transition for a diver with a basic scuba certification to one certified to dive during activities covered by the RA HASP requires a specific training program to enable an individual to safely perform research activities within this challenging environment.

Candidate prerequisites include:

- Age: 21 years or older;
- Adult certification in Basic Scuba Diving by a nationally recognized agency (NAUI, Professional Association of Diving Instructors [PADI], Scuba Schools International [SSI], etc.);
- Successful completion of a diving medical examination; and
- Successful completion of a swimming and scuba skill evaluation.

### **4.2 EVALUATIONS**

#### **4.2.1 Medical Examination**

The applicant for training must be certified by a licensed physician to be medically qualified for diving as designated in Section 5 before proceeding with the training.

## **4.2.2 Swimming Evaluation**

The applicant for training must successfully perform the following tests, or their equivalent, in the presence of the DSO or an examiner approved by the DSO:

- Swim underwater without swim aids for a distance of 25 yards without surfacing.
- Swim 400 yards in less than 12 minutes without swim aids.
- Tread water for 10 minutes, or 2 minutes without the use of hands, without swim aids.
- Transport another person of equal size a distance of 25 yards in the water without the use of swim aids.

## **4.3 SCUBA TRAINING**

### **4.3.1 Practical Training**

At the completion of scuba training, the trainee must satisfy the DSO or the DSO's designee of the trainee's ability to perform the following in a pool or in sheltered water, as a minimum performance standard:

1. Enter water with full equipment.
2. Alternate between snorkel and scuba on the surface.
3. Remove, replace, and clear face mask while submerged breathing from regulator.
4. Remove and replace scuba equipment while submerged.
5. Demonstrate understanding of underwater signs and signals.
6. Demonstrate air sharing, including both buddy breathing and the use of an alternate air source, as both donor and recipient, stationary, and swimming with and without a face mask.
7. As a diver, perform in-water rescue of a simulated passive, non-breathing victim of a diving accident, transporting the victim 50 yards in under 4 minutes.
8. Demonstrate simulated in-water mouth-to-mouth resuscitation.
9. Demonstrate water skills and ability acceptable to the DSO or evaluator.
10. Demonstrate understanding of emergency ascent techniques.
11. Demonstrate competence in controlled ascent techniques.
12. Demonstrate competence in diver-related first aid and rescue.

### **4.3.2 Written Examination**

Before completing training, the trainee must pass a written examination for basic scuba diving principles and practices. A passing score on this exam is required to obtain a Diver-In-Training authorization. The exam will cover knowledge of at least the following:

1. Function, care, use, and maintenance of diving equipment.
2. Physics and physiology of diving.
3. Diving regulations and precautions.
4. Nearshore currents and waves.
5. Dangerous marine animals.
6. Emergency procedures, including buoyant ascent and ascent by air sharing.
7. Currently accepted "No-Decompression" and repetitive "No-Decompression" limits, and decompression procedures.

8. Proper use of dive tables.
9. Underwater communications.
10. Aspects of fresh water and altitude diving.
11. Hazards of breath-hold dives and ascents.
12. Planning and supervision of diving operations.
13. Diving hazards.
14. Cause, symptoms, treatment, and prevention of the following:
  - a. Near drowning;
  - b. Air embolism and related pulmonary overpressure conditions;
  - c. Carbon dioxide excess;
  - d. "Squeezes" associated with diving;
  - e. Oxygen toxicity;
  - f. Nitrogen narcosis;
  - g. Carbon monoxide poisoning;
  - h. Exhaustion and panic;
  - i. Respiratory fatigue and motion sickness;
  - j. Decompression sickness;
  - k. Hypothermia - hyperthermia; and
  - l. Hypoxia and anoxia.

#### **4.3.3 Open Water Evaluation**

The trainee must satisfy the DSO or an approved evaluator of his/her ability to perform at least the following in open water, as a minimum standard:

1. Surface dive to a depth of 10 feet in open water without scuba.
2. Share a breathing air source, including both buddy breathing and use of an alternate air source, as both donor and recipient. Swim effectively a prescribed distance and make a proper controlled ascent.
3. Enter and leave open water or surf, if applicable, wearing scuba gear.
4. Kick on the surface 400 yards while wearing scuba gear, but not breathing from the scuba unit.
5. Successfully complete five open-water scuba dives for a minimum total time of 4 hours, of which 2 hours cumulative bottom time must be on scuba. Not more than three of these training dives must be made in 1 day.
6. Demonstrate judgment adequate for safe diving.
7. Where appropriate, demonstrate the ability to maneuver in aquatic plants at and below the surface.
8. Complete a simulated emergency swimming ascent.
9. Remove, replace, and clear mask and regulator while submerged.
10. Proficiently exit the water and board a diving support vessel.
11. Achieve and maintain neutral buoyancy while submerged.
12. Demonstrate techniques of self-rescue and buddy rescue for a tired diver and unconscious non-breathing diver.
13. Navigate underwater at least a reciprocal compass course.
14. Demonstrate ability to plan and execute a dive.

## **5. MEDICAL REQUIREMENTS**

### **5.1 GENERAL**

Dive team members who are potentially exposed to hyperbaric conditions must pass a current diving physical examination and have been declared by a licensed physician to be fit to engage in diving activities, as may be limited or restricted in the medical evaluation report.

All medical evaluations required by this standard must be performed by, or under the direction of, a licensed physician of the applicant-diver's choice, preferably one trained in diving/undersea medicine.

The diver should be free of any chronic disabling disease and be free of any condition contained in the list of conditions for which restrictions from diving is generally recommended.

### **5.2 FREQUENCY OF MEDICAL EVALUATIONS**

A medical evaluation must be completed:

- Before a diver may dive, unless an equivalent medical evaluation has been given within the preceding year, the physician has obtained the results of that examination, and those results have been reviewed and found satisfactory by the DSO and DCB.
- Annually from the date of initial evaluation or last equivalent evaluation.
- After any major injury or illness or any condition requiring hospitalization. These occurrences require clearance to return to diving from a physician. If the condition or illness is pressure-related, then the clearance to resume diving must come from a physician trained in diving medicine.
- After any episode of unconsciousness.
- After any diving accident.

### **5.3 INFORMATION PROVIDED TO EXAMINING PHYSICIAN**

A copy of the medical evaluation requirements must be provided to the examining physician. Attachment H (Diving Medical Exam Overview for the Examining Physician) may be used for this purpose.

### **5.4 CONTENT OF MEDICAL EXAMINATIONS**

Medical examinations conducted initially and periodically must consist of the following:

- Applicant agreement for release of medical information to the DSO and DCB;
- Medical history;
- Diving-related medical history (Attachment I);
- Diving physical examination; and
- Any additional tests the physician may consider necessary.

### **5.5 RESTRICTION OF DIVING**

Conditions for which restriction from diving is recommended are presented in Attachment J (Diving Emergency Management Procedures).

## **5.6 LABORATORY REQUIREMENTS FOR DIVING MEDICAL EXAMINATION**

The initial entry examination, first examination with a physician unfamiliar with the diver's past diving medical history, and/or the first examination over 40 should include:

- Medical history;
- Chest x-ray;
- Electrocardiogram (EKG);
- Pulmonary function test;
- Audiogram;
- Visual acuity;
- Complete blood count;
- Blood chemistry (SMA-12);
- Urinalysis; and
- Any tests deemed necessary by the physician to qualify the individual for scuba diving.

A periodic re-examination must include:

- Medical history;
- Pulmonary function test;
- Audiogram;
- Visual acuity;
- Complete blood count;
- Blood chemistry (SMA-12);
- Urinalysis; and
- Any further tests deemed necessary by the physician to qualify the patient for scuba diving.

An exercise stress EKG may be performed at the advisement of the physician at the first exam over age 35 and at 2-year intervals thereafter, as appropriate. If there is evidence of high risk for cardiac artery disease (i.e., family history, smoking, obesity, or high cholesterol), more frequent tests are strongly advised.

## **5.7 PHYSICIAN'S WRITTEN REPORT**

After any medical examination relating to the individual's fitness to dive, the examining physician must prepare a written report documenting the examining physician's opinion of the individual's fitness to dive, including any recommended restrictions or limitations. Attachment K (Medical Examination of Scientific Diver) may be used for this purpose. These written reports must be reviewed by the DSO.

**ATTACHMENT 1**  
**SAFE ASCENT RECOMMENDATIONS**

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## *Safe Ascent Recommendations*

From: AAUS Biomechanics of Safe Ascents Workshop, 1990, Lang and Egstrom (Eds.)

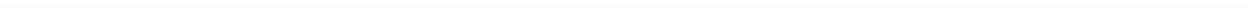
It has long been the position of the AAUS that the ultimate responsibility for safety rests with the individual diver.

The time has come to encourage divers to slow their ascents.

1. Buoyancy compensation is a significant problem in the control of ascents.
  2. Training in, and understanding of, proper ascent techniques is fundamental to safe diving practice.
  3. Before certification, the diver is to demonstrate proper buoyancy, weighting, and a controlled ascent, including a "hovering" stop.
  4. Divers shall periodically review proper ascent techniques to maintain proficiency.
  5. Ascent rates shall not exceed 60 feet per minute.
  6. A stop in the 10-30 foot zone for 3-5 minutes is recommended on every dive.
  7. When using a dive computer or tables, non-emergency ascents are to be at the rate specified for the system being used.
  8. Each diver shall have instrumentation to monitor ascent rates.
  9. Divers using dry suits shall have training in their use.
  10. Dry suits shall have a hands-free exhaust valve.
  11. Buoyancy compensators (BCs) shall have a reliable rapid exhaust valve which can be operated in a horizontal swimming position.
  12. A BC is required with dry suit use for ascent control and emergency flotation.
  13. Breathing 100% oxygen above water is preferred to in-water air procedures for omitted decompression.
-

**ATTACHMENT 2**

**DIVING MEDICAL EXAM OVERVIEW  
FOR THE EXAMINING PHYSICIAN**



## *Diving Medical Exam Overview for the Examining Physician*

### **TO THE EXAMINING PHYSICIAN:**

This person, \_\_\_\_\_, requires a medical examination to assess his/her fitness for authorization as a Diver. His/her answers on the Diving History Form (attached) may indicate potential health or safety risks as noted. Your evaluation is requested on the attached Scuba Diving Medical Evaluation Report. If you have questions about diving medicine, you may wish to consult one of the references on the attached list. Please contact the undersigned Diving Safety Officer if you have any questions or concerns about diving medicine or the Diving Safety Program standards outlined in the *Diving Safety Manual*.

Thank you for your assistance.

Scuba and other modes of compressed-gas diving can be strenuous and hazardous. A special risk is present if the middle ear, sinuses, or lungs do not readily equalize air pressure changes. The most common cause of distress is eustachian insufficiency. Most fatalities involve deficiencies in prudence, judgment, emotional stability, or physical fitness. Consult the following list of conditions that usually restrict candidates from diving:

(Adapted from Davis 1986:47-50, bracketed numbers are pages in Davis)

1. Tympanic membrane perforation or aeration tube [7].
  2. Inability to auto inflate the middle ears [6, 7, 8].
  3. External ear exostoses or osteomas adequate to prevent external ear canal pressure equilibration [4].
  4. Meniere's disease or other chronic vertiginous conditions, status post-surgery, such as subarachnoid endolymphatic shunt for Meniere's disease [11].
  5. Stapedectomy and middle ear prostheses [9].
  6. Chronic mastoiditis or mastoid fistula [5].
  7. Any maxillofacial deformity that interferes with the retention of the regulator mouth piece [43].
  8. Corrected near visual acuity not adequate to see tank pressure gauge, watch, decompression tables, and compass underwater. Uncorrected visual acuity not adequate to see the diving buddy or locate the boat in case corrective lenses are lost underwater [13].
  9. Radial keratotomy or other recent ocular surgery [14].
  10. Claustrophobia of a degree to predispose to panic [15, 16].
  11. Suicidal ideation [16].
  12. Significant anxiety states [16].
  13. Psychosis [18].
  14. Severe depression [16].
-

15. Manic states [16].
  16. Alcoholism [19, 20].
  17. Mood-altering drug use [19, 20].
  18. Improper motivation for diving [16, 17, 18].
  19. Episodic loss of consciousness [1, 22].
  20. History of seizure. History of seizure in early childhood must be evaluated individually [21].
  21. Migraine [20].
  22. History of cerebrovascular accident or transient ischemic attack [23].
  23. History of spinal cord trauma with neurologic deficit - whether fully recovered or not [23].
  24. Any degenerative or demyelinating CNS process [25].
  25. Brain tumor with or without surgery [24].
  26. Intracranial aneurysm or other vascular malformation [24].
  27. History of neurological decompression sickness with residual deficit [23, 24].
  28. Head injury with sequelae [21].
  29. History of intracranial surgery [24].
  30. Sickle Cell Disease [34].
  31. Polycythemia or leukemia [34].
  32. Unexplained anemia [34].
  33. History of myocardial infarction [28, 29, 30].
  34. Angina or other evidence of coronary artery disease [29].
  35. Unrepaired cardiac septal defects [32].
  36. Aortic stenosis or mitral stenosis [32].
  37. Complete heart block [31].
  38. Fixed second-degree heart block [31].
  39. Exercise-induced tachyarrhythmias [31, 32].
  40. Wolf-Parkinson-White (WPW) Syndrome with paroxysmal atrial tachycardis or syncope [31].
  41. Fixed-rate pacemakers [33].
  42. Any drugs that inhibit the normal cardiovascular response to exercise tolerance [31].
  43. Peripheral vascular disease, arterial or venous, severe enough to limit exercise tolerance [33, 41].
  44. Hypertension with end-organ finding-retinal, cardiac, renal, or vascular [30]
  45. History of spontaneous pneumothorax [36].
-

46. Bronchial asthma. History of childhood asthma requires special studies [7, 35].
47. Exercise or cold-induced asthma [36, 37].
48. X-ray evidence of pulmonary blebs, bullae, or cysts [36, 37].
49. Chronic obstructive pulmonary disease [37].
50. Insulin-dependent diabetes mellitus. Diet or oral medication-controlled diabetes if there is a history of hypoglycemic episodes [38].
51. Any abdominal wall hernia with potential for gas-trapping until surgically corrected. Paraesophageal or incarcerated sliding hiatal hernia [39].
52. Sliding hiatus hernia if symptomatic due to reflux esophagitis [39].
53. Pregnancy [1, 45].
54. Osteonecrosis. A history consistent with a high risk of dysbaric osteonecrosis.
55. Any condition requiring ingestion of the following medication: antihistamines, bronchodilators, steroids, barbiturates, phenytoin, mood-altering drugs, insulin.

#### **REFERENCES:**

- Bove, A. and J. Davis. *Diving Medicine*. 1990. W.B. Saunders Co., Philadelphia.
- Davis, Jefferson, M.D. (ed.). *Medical Examination of Sport Scuba Divers*. 1989. Best Publishing Co., P.O. Box 30100, Flagstaff AZ 86003-0100.
- Dueker, C.W. *Scuba Diving in Safety and Health*, Madison Publishing Associates, Diving Safety Digest, P.O. Box 2735, Menlo Park, CA 94026.
- Edmonds, C., C. Lowery, and J. Pennefather. *Diving and Subaquatic Medicine*, 3rd Edition. 1992. Butterworth-Heinemann Ltd., Oxford. (Available from Best Publishing Company, P.O. Box 30100, Flagstaff, AZ 86003-0100).
- National Oceanic and Atmospheric Administration. *NOAA Diving Manual*. Superintendent of Documents, U.S. Government Printing Office, Washington, D.C.
- Shilling, C.W., C.B. Carlson, and R.A. Mathias. *The Physician's Guide to Diving Medicine*. Plenum Press, New York (Available through Underwater and Hyperbaric Medical Society, Bethesda, MD).
- U.S. Navy. *U.S. Navy Diving Manual*. Superintendent of Documents, U.S. Government Printing Office, Washington, DC.
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**ATTACHMENT 3**  
**DIVING HISTORY**

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## DIVING HISTORY

Last Name:	First Name:	M.I
Date of Birth:	Employee Number:	
Office Phone:	Email:	

### SECTION 1: DIVING TRAINING HISTORY

Date of First Certification:	Agency	Location

Certification Type	Agency Date	Number	Duration	Location
Basic				
Open Water				
Advanced				
Rescue				
Asst. Instructor				
Dive Master				
O2 Administration				
Instructor				
Military				

Other Dive Training (List Below):

Type of Training	Agency or School	Date(s)	Location

**(Please provide photocopies of all certificates and c-cards to document claimed training)**

### SECTION 2. EMERGENCY TRAINING HISTORY

Date of Last Physical:	Date of Last Diving Physical:
Date of CPR Training:	Agency:
Name of Course:	
Date of First-Aid Training:	Agency:
Name of Course:	

### SECTION 3. DIVING EXPERIENCE

#### A. General

Years Diving: \_\_\_\_\_ Age 1st Skin Dive: \_\_\_\_\_ Age first Compressed Air Dive: \_\_\_\_\_

Military Diving Experience: \_\_\_\_\_

---

**B. Diving Experience**

Type of Diving	Total Years	Maximum Depth	Total # Dives	# Dives Last Year	Cumulative Bottom Time
Compressed Air Scuba					
Compressed Air Surface-Supplied					
Nitrox – Open-Circuit Scuba					
Trimix - Open-Circuit Scuba					
Heliox (He/O2)					
Oxygen Rebreather					
Semi-Closed Circuit Rebreather					
Closed-Circuit Rebreather					
One-Atm. Diving Suit					

**C. Activity Profile**

Past Experience with (✓ check all that apply):

<input type="checkbox"/>	Sport Diving
<input type="checkbox"/>	Research
<input type="checkbox"/>	Marine Life Collecting
<input type="checkbox"/>	Net Tending
<input type="checkbox"/>	Commercial Collecting
<input type="checkbox"/>	Commercial Construction
<input type="checkbox"/>	Saturation
<input type="checkbox"/>	Surface Decompression
<input type="checkbox"/>	Mixed Gas/Heliox
<input type="checkbox"/>	Education
<input type="checkbox"/>	Other:

Number of Dives per Day: Maximum: \_\_\_\_\_ Average: \_\_\_\_\_ Minimum: \_\_\_\_\_

List Approximate Number of Dives (Past Year) in the Following Categories (enter 0 where appropriate):

Depth:	
< 30 feet:	
30 to 60 feet:	
60 to 100 feet:	
100 to 150 feet:	
>150 feet:	

Conditions:	
Night:	
Low Visibility:	
Physical Overhead:	
Bluewater (No Bottom):	

Platform/Technology:	
Small Boat Dives:	
Shipboard Diving	

Other (Describe): \_\_\_\_\_

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**SECTION 4. INJURY HISTORY**

	2001	2002	2003	2004	2005	Total
Total Number of Dives						
Deepest Dive						
# Dives with Staged Decompression						
# Dives with Surface Decompression						
# Dives Resulting in Skin Bends or “niggles” (not treated):						
# Dives Resulting in Bends (pain only):						
# Central Nervous System DCS:						
# Times treated for DCS:						
Any permanent injury from DCS:						

If you have ever had DCS, what type of treatment did you receive?

<b>a. For Bend Pain:</b>	
None:	
Aspirin:	
Oxygen on Surface USN Table (list):	

<b>b. For CNS Symptoms:</b>	
None:	
Aspirin:	
Oxygen on Surface USN Table (List:	
Other:	

Do you have difficulty clearing your ears on descent, or in aircraft?

Yes / No      IF YES, EXPLAIN: \_\_\_\_\_

Does ear difficulty limit your diving?

Yes / No      If yes, how often: 1 2 10 50 100

Have you ever experienced “ear squeeze” to the point of having temporary hearing loss?

Yes / No      If yes, how often: 1 2 10 50 100

Have you ever aborted a dive because of ear problems? Yes / No

If yes, how often: 1 2 10 50 100

Have you ever had difficulty with your sinuses during a dive? Yes / No

If yes, how often: 1 2 10 50 100

Have you ever had a sinus squeeze? Yes / No

If yes, how often: 1 2 10 50 100

**APPLICANT'S AFFIDAVIT:**

I certify that the above information is true to the best of my knowledge and ability. I understand that misstatements on this report can result in loss of my diving privileges.

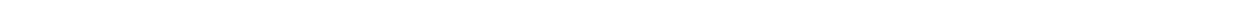
Signature of Applicant: \_\_\_\_\_

Date: \_\_\_\_\_

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**ATTACHMENT 4**

**DIVING EMERGENCY MANAGEMENT PROCEDURES**



# **DIVING EMERGENCY MANAGEMENT PROCEDURES**

## **INTRODUCTION**

A diving accident victim could be any person who has been breathing air underwater regardless of depth. It is essential that emergency procedures are pre-planned and that medical treatment is initiated as soon as possible. It is the responsibility of the Lead Diver for each project or dive to establish effective diving emergency procedures for the local diving operations, including evacuation and medical treatment.

## **GENERAL PROCEDURES**

Depending on the nature of the diving accident, stabilize the patient, administer 100% oxygen, contact the local Emergency Medical Services (EMS) for transport to a medical facility, and contact the Diving Safety Officer (DSO), as appropriate. Explain the circumstances of the dive accident to evacuation teams, medics, and physicians. Do not assume that they understand why 100% oxygen may be required for the diving accident victim, or that recompression may be necessary.

Make appropriate contact with the victim, or rescue as required.

- Establish (A)irway, (B)reathing, (C)irculation as required. Control severe bleeding and treat for shock, as per first-aid guidelines.
  - Administer 100% oxygen, if appropriate (in cases of suspected near-drowning, decompression sickness (DCS), arterial gas embolism (AGE), cardiac emergencies, or breathing emergencies).
  - Contact local EMS for transport to nearest medical treatment facility.
  - If possible, complete or assign additional personnel to complete the following actions:
    1. Take notes of how the incident occurred and all response measures taken, including a time table of actions;
    2. Isolate the victim's equipment for inspection by the DSO and authorities;
    3. Manage the accident scene for crowd control. Assign someone to keep bystanders from interfering; and
    4. Make statements regarding the incident only to personnel authorized by the Health and Safety Manager.
  - Notify the DSO and appropriate Health and Safety Manager.
  - Complete and submit the Incident/Near Miss Investigation Report (Attachment F to the RA HASP).
-

**ATTACHMENT 5**  
**MEDICAL EXAMINATION OF DIVER**

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# MEDICAL EXAMINATION OF DIVER

## SECTION 1: MEDICAL HISTORY.

*TO BE COMPLETED BY THE DIVER PRIOR TO EXAM.*

Last Name:	First Name:	M.I
Date of Birth:	Sex:	
Home Phone:	Email:	
Home Street Address:		
City:	State:	Zip:

Have you previously completed this form? ..... Yes / No

Is your medical history unchanged since last completing this form? ..... Yes / No

If the answer to both questions was 'yes', then skip to Section 2.

### **To The Applicant:**

Scuba diving makes considerable demands on your physical and emotional condition.

Diving with particular health issues may present serious hazards for you, your dive buddy, or anyone coming to your aid if you have difficulty in the water. It is essential that certain medical and physical requirements be met before beginning a diving or training program.

Your answers to the following questions are more important, in many cases, than the physician's examination. You must provide accurate and complete information. This form will be kept confidential. If you believe any question amounts to an invasion of your privacy, you may elect to omit an answer provided that you subsequently discuss that matter with your own physician, and he/she must indicate, in writing, that you have done so and that no health hazard exists.

If any answer indicates a condition which might make diving hazardous, you will be asked to review the matter with your physician. In such instances, his/her written authorization will be required in order for further consideration to be given to your application.

**Family History:**

If single, answer as child; If married, answer as spouse

Relative	Age	State of Health	Occupation	Age at Death	Cause of Death
Father/Husband					
Mother/Wife					
Child 1 Sex:					
Child 2 Sex:					
Child 3 Sex:					
Child 4 Sex:					
Child 5 Sex:					
Sibling 1 Sex:					
Sibling 2 Sex:					
Sibling 3 Sex:					
Sibling 4 Sex:					
Sibling 5 Sex:					

**Personal History:**

Please answer ALL questions. Comment on all positive answers in the space below.

1. When was your last physical exam and what was its purpose? \_\_\_\_\_
2. Who examined you (name and address)? \_\_\_\_\_
3. Have you ever been rejected for armed service, employment, or insurance for medical reasons? ..... Yes/No
4. Has your physical activity ever been restricted for any reason in the past 5 years? ..... Yes / No
5. Have you ever received treatment or counseling for a nervous condition, personality or character disorder, or emotional problem? ..... Yes / No
6. Are you being treated by a doctor at the present? ..... Yes / No
7. Are you taking any medication daily, or on a regular basis, either orally or by injection? ..... Yes / No
8. What medication(s) do you take on an irregular basis and how often? \_\_\_\_\_
9. How often do you take aspirin or aspirin-like drugs? \_\_\_\_\_
10. How often do you take "cold medicines," i.e., antihistamines? \_\_\_\_\_
11. In the course of a year, list any other drugs/medicines not listed above that you might take:  
 \_\_\_\_\_  
 \_\_\_\_\_
12. Do you have allergies to any drugs? ..... Yes / No  
 If yes, list:.....  
 \_\_\_\_\_
13. Are you subject to air/seasickness? ..... Yes / No

14. Have you had any of the following diseases?

- |                      |          |                        |          |
|----------------------|----------|------------------------|----------|
| Chickenpox: .....    | Yes / No | Measles: .....         | Yes / No |
| Tuberculosis: .....  | Yes / No | Mumps: .....           | Yes / No |
| Scarlet Fever: ..... | Yes / No | Rheumatic Fever: ..... | Yes / No |
| Poliomyelitis: ..... | Yes / No | Malaria: .....         | Yes / No |
| Jaundice: .....      | Yes / No | German Measles: .....  | Yes / No |
| Meningitis: .....    | Yes / No |                        |          |

If Yes, give details: \_\_\_\_\_

15. What other illnesses have you had? \_\_\_\_\_

16. Have you ever had any operations? ..... Yes / No

17. Have you ever had any broken bones? ..... Yes / No

18. Have you ever been knocked unconscious? ..... Yes / No

19. Do you smoke/use any type of tobacco? ..... Yes / No

If yes, how often? \_\_\_\_\_

Check whether or not you have, or ever have had, any of the following. Explain any “yes” responses under “Remarks,” providing dates and other pertinent information. If you wish this to be confidential, please say “confidential,” but it must be discussed with the physician during the examination.

20. Frequent colds or sore throat. .... Yes / No

21. Hay fever or sinus trouble. .... Yes / No

22. Trouble breathing through nose, other than during colds. .... Yes / No

23. Painful or running ear, mastoid trouble, broken eardrum. .... Yes / No

24. Hearing problems. .... Yes / No

25. Asthma or bronchitis. .... Yes / No

26. Shortness of breath after moderate exercise. .... Yes / No

27. History of Pleurisy. .... Yes / No

28. Collapsed lung (pneumothorax). .... Yes / No

29. Chest pain or persistent cough. .... Yes / No

30. Tiring easily. .... Yes / No

31. Spells of fast, irregular, or pounding heartbeat. .... Yes / No

32. High or low blood pressure. .... Yes / No

33. Any kind of “heart trouble.” .... Yes / No

34. Frequent upset stomach, heartburn, or indigestion, or peptic ulcer. .... Yes / No

35. Anemia. .... Yes / No

36. Belly or backache lasting more than a day or two. .... Yes / No

37. Kidney or bladder disease; blood, sugar, or albumin in urine. .... Yes / No

38. Broken bone, serious sprain or strain, or dislocated joint. .... Yes / No

39. Rheumatism, arthritis, or other joint trouble. .... Yes / No

40. Severe or frequent headaches. .... Yes / No

41. Trouble sleeping, frequent nightmares, or sleepwalking. .... Yes / No

42. Nervous breakdown or periods of marked depression or nervousness. .... Yes / No

43. Dizzy spells, fainting spells, or fits. .... Yes / No

44. A phobia for closed-in places, large open places, or high places. .... Yes / No

45. Any neurological or psychological condition. .... Yes / No

46. Alcoholism or any drug or narcotic habit (including regular use of sleeping pills, Bensedrine, Prozac, Haldol, etc.). .... Yes / No

47. Recent gain or loss of weight or appetite. .... Yes / No

48. Hepatitis. .... Yes / No



**SECTION 2. MEDICAL HISTORY UPDATE FOR DIVING REAUTHORIZATION**

Have you been hospitalized or have you had any accidents or injuries of any kind since your previous diving authorization? ..... Yes / No

If yes, explain and give dates in "Remarks" section above.

Have you suffered any diving injury or been involved in any diving incident since your last diving authorization? ..... Yes / No

If yes, explain and give dates in "Remarks" section above

**Diver Affirmation:** I certify that I have not withheld any information, and that the above is accurate to the best of my knowledge.

Signature: \_\_\_\_\_

Date: \_\_\_\_\_

**Applicant's Release of Medical Information:**

I authorize the release of this information and all medical information subsequently acquired in association with my diving to the Diving Safety Officer and Diving Control Board, or their designee at (place): \_\_\_\_\_

on (date): . \_\_\_\_\_

Signature of Applicant: \_\_\_\_\_

Date: \_\_\_\_\_

## MEDICAL EXAMINATION - DIVERS

### SECTION 3.

*TO BE COMPLETED BY THE PHYSICIAN*

Last Name:	First Name:	M.I
Date of Birth:		Sex:
Height:	Weight	

#### Medical History Review:

Is there any significant past history that would disqualify the applicant for diving? ..... Yes / No

Remarks: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

General Appearance: \_\_\_\_\_

Blood Pressure: \_\_\_\_\_ Pulse: \_\_\_\_\_

Vision: Uncorrected: R/ L/ \_\_\_\_\_ Corrected: R/ L/ \_\_\_\_\_

Color Test: Normal \_\_\_\_\_ Deficient \_\_\_\_\_

**Examination:** Please check all items and, if abnormal, give details.

Item	Normal	Abnormal	Comments
1. Head and Neck			
2. Nose, Sinsus			
3. Ear Canals			
4. Ear Drums			
5. Ear Clearing			
6. Webber, Rinne			
7. Fundi, Disks			
8. Pupils, ECM			
9. Peripheral Visions			
10. Mouth and Throat			
11. Neck, Nodes/ Mass			
12. Auxiliary Nodes			
13. Back and Chest			
14. Lungs			
15. Heart Sounds			
16. Heart Rhythm, Size			
17. Abdomen LS & K			
18. Genitalia, Nodes			

19. Cremasteric			
20. DTR's Tricep			
21. DTR's Bicep			
22. DTR's Knee			
23. DTR's Ankle			
24. Plantar Reflex			
25. Sensory, Noxious			
26. Sensory, Fine			
27. Sensory, Vib			
28. Heel/Toe Walk			
29. Romberg			
30. Fast Pointing			
31. Finger – Nose			
32. Rapid Movement			
33. Squat			
Emotional Stability:			
Diving Aptitude:			
Breath Hold Duration:			

Examiner's Signature: \_\_\_\_\_ Date: \_\_\_\_\_

Print or Type Name: \_\_\_\_\_

Address: \_\_\_\_\_

Telephone: \_\_\_\_\_