

**FINAL
REVISION 0**

**DELINEATION AND REMEDIATION
OF CONTAMINATED SOIL, GROUNDWATER, AND DEBRIS
AT STRYKER BRIGADE CANTONMENT AREAS**

ACCIDENT PREVENTION PLAN

FORT WAINWRIGHT, ALASKA

Contract No. W911KB-04-P-0136

Prepared for:



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U.S. Army Corps of Engineers, Alaska District
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August 2006

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Fort Wainwright, Alaska



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- Appendix A Site-Specific Safety and Health Plan – Delineation and Remediation of Contaminated Soil, Groundwater and Debris at Stryker Brigade Cantonment Areas

ACRONYMS AND ABBREVIATIONS

AHA	activity hazard analysis
APP	Accident Prevention Plan
CFR	Code of Federal Regulations
CIH	Certified Industrial Hygienist
CPR	cardiopulmonary resuscitation
EPA	Environmental Protection Agency
FM	field manager
HAZCOM	hazard communications
HAZWOPER	hazardous waste operations and emergency response
HSD	Health and Safety Director
HSM	Health and Safety Manager
LO/TO	lockout/tagout
MEC	munitions and explosives of concern
MSDS	material safety data sheets
NWI	North Wind, Inc.
OSHA	Occupational Safety and Health Administration
PM	Project Manager
POC	point of contact
PPE	personal protective equipment
SOP	standard operating procedure
SSHO	Site Safety and Health Officer
SSHP	Site Safety and Health Plan
USACE	U.S. Army Corps of Engineers
UXO	unexploded ordnance

1.0 INTRODUCTION

The U.S. Army Corps of Engineers (USACE), Alaska District has tasked North Wind, Inc. (NWI) with performing a site characterization, excavation, and remediation of contaminated media (soil, debris, water) and solid waste on and near the Stryker Brigade Cantonment Areas on Fort Wainwright, Alaska. This project is being performed under contract No. W911KB-04-P-0136.

NWI has prepared this Accident Prevention Plan (APP) to establish guidelines and practices for conducting the fieldwork to ensure the safety and health of field personnel. This APP incorporates standard operating procedures (SOPs) in the *North Wind, Inc. Corporate Health and Safety Manual*, as is supplemented with Site-specific Safety and Health Plan (SSHP) appendix for specific scopes of work.. This APP has been prepared to meet the requirements from the USACE Safety and Health Requirements Manual (EM 385-1-1).

This signed copy of the APP with associated SSHP appendix shall be kept at the project site during field activities and will be amended or revised as project activities or conditions change or when supplemental information becomes available. The Site Safety and Health Officer (SSHO) will have enforcement authority for implementation of the APP for all field activities. Prior to commencement of field activities, NWI personnel and subcontractors will be trained on the APP and applicable SSHP appendix by the SSHO. This APP is augmented by activity hazard analyses (AHAs), or equivalent Task Hazard Analyses or Job Safety Analyses, that are contained with in each SSHP for key activities. AHAs are reviewed by all field personnel as part of the APP and SSHP training.

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2.0 BACKGROUND INFORMATION AND PROJECT DESCRIPTION

This section provides basic project, climatological, and background information.

Table 1. Project Information

Contract Number(s)	W911KB-04-P-0136
Client	U.S. Army Corps of Engineers, Alaska District
Project/Site Name	Delineation and Remediation of Contaminated Soil at Stryker Brigade Cantonment and FWA-102 Areas
Site Address	Fort Wainwright, Fairbanks, Alaska
North Wind Project Manager	Aran Armstrong
North Wind Office	235 East 8th Ave Suite 210, Anchorage, AK 99501
Date Accident Prevention Plan Prepared	July 2006
Dates This Plan Has Been Amended	New Document
Site Access	Pass security checkpoint to get on Ft. Wainwright
Site Size	Site-specific
Site Topography	Relatively flat
Prevailing Weather	Average monthly temperature and precipitation information is provided below.

Table 2. Average Monthly Climate Data, Fairbanks, Alaska (1961 – 1990)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Temperature (°F)	-17.8	-14	-1.2	20.1	37.8	49.2	52.2	46.9	36	17.8	-5.2	-14.6
Precipitation (in.)	0.52	0.44	0.35	0.34	0.62	1.3	1.88	1.91	1.04	0.92	0.75	0.85
Source: Greg McCurdy, Western Regional Climate Center, 1997.												

2.1 Site Description and History

Fort Wainwright occupies a 915,000-acre military reservation located west of Fairbanks, Alaska. Fort Wainwright was originally established in 1938 as a cold-weather testing station. The facility was renamed Ladd Army Air Field by the U.S. Army in December 1939. During World War II, it served as a crew-transfer point in the Army Air Corps' lend-lease program. In 1947, the newly established U.S. Air Force took over the facility and renamed it Ladd Air Force Base. It was used as a re-supply and maintenance base for the remote Distant Early Warning Sites and an experimental station in the Arctic Ocean. In 1961, all base operations were transferred back to the U.S. Army and the base was renamed Fort Wainwright. Currently, primary missions at Fort Wainwright include training of infantry soldiers in the arctic environment, testing of equipment in arctic conditions, preparation of troops for defense of the Pacific Rim, and rapid deployment of troops worldwide. Fort Wainwright includes the main post area, a range complex, and two maneuver areas. On-site industrial activities include use of fixed-wing aircraft, helicopters, and vehicle maintenance and support activities. Figure 1 presents a location map of Fort Wainwright. Figure 2 shows a map of the actual Post areas.

New housing and buildings are to be constructed near the Cantonment Area at Fort Wainwright in the Stryker Brigade Cantonment Area. The areas where the buildings are being erected may contain contamination from past activities in the area.

2.2 Primary Work To be Performed

The following are the primary work task to be performed at and near the Stryker Cantonment Areas at Ft. Wainwright. These work activities and the associated hazards and hazard mitigation measures are further described in the project-specific SSHP (Appendix A).

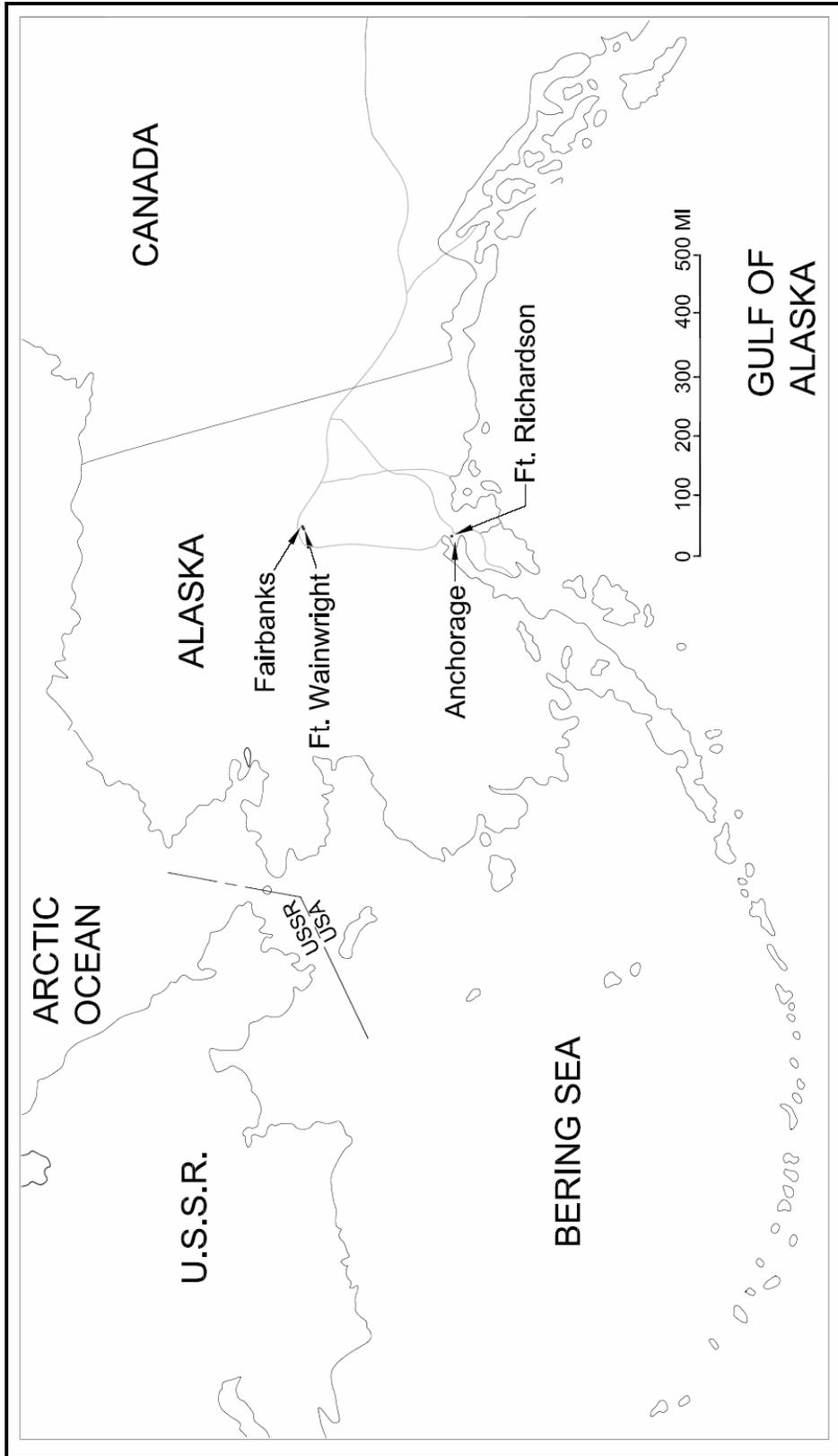


Figure 1 Fort Wainwright Location Map

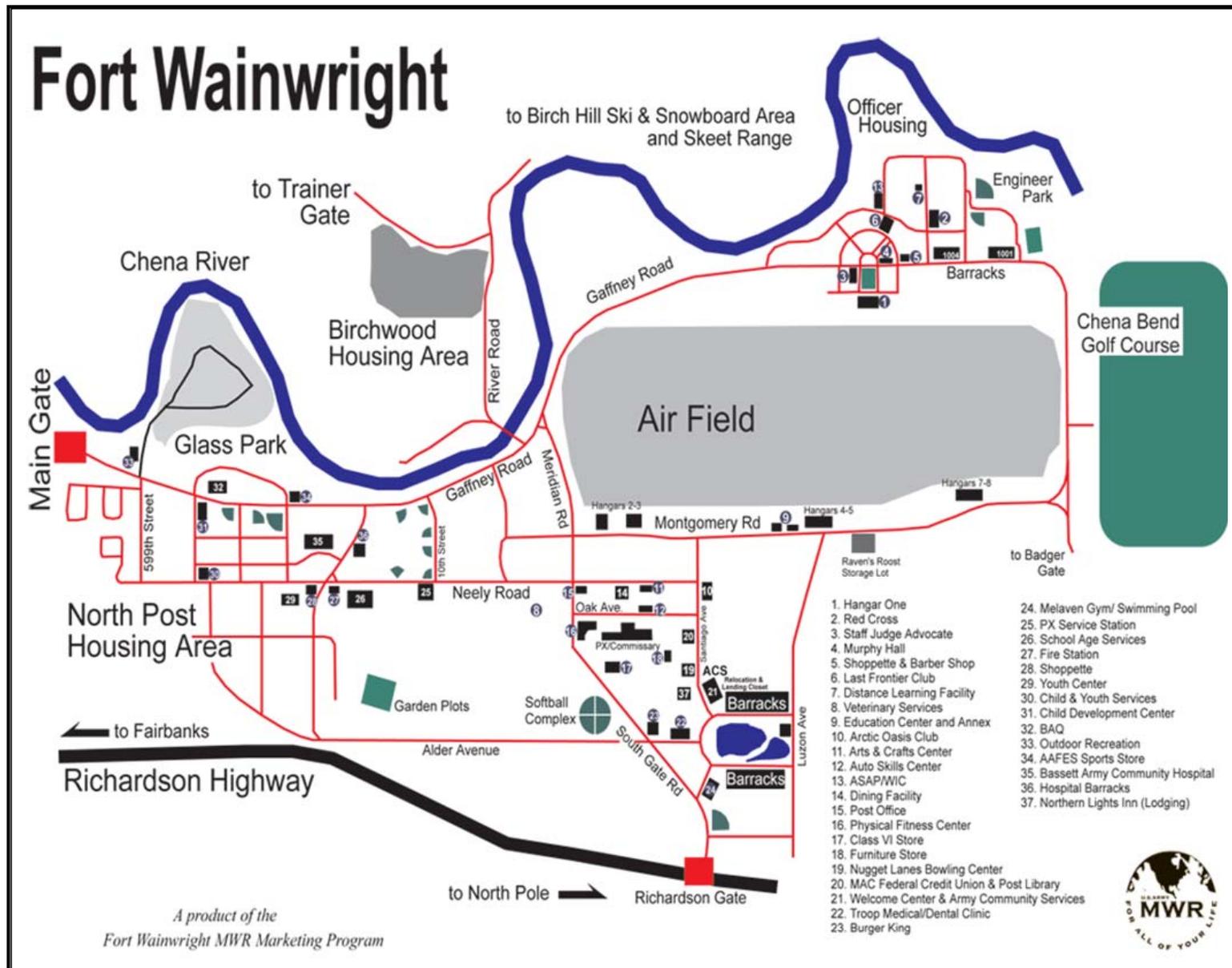


Figure 2 Map of Ft. Wainwright

- ◆ Potentially contaminated media (i.e., air, soil, groundwater, debris, equipment, and surface/subsurface waste encountered) field screening with direct reading instruments, field test kits, and wipe samples and collection of potentially contaminated media and waste samples for laboratory analysis.
- ◆ Site characterization activities may including geophysical surveys, ground water well installation and sampling, excavation, drilling, stockpiling sampling, sorting, segregation, and all associated investigative derived waste management tasks (i.e., waste packaging, over packing, handling, storage, transportation, sampling, and disposal).
- ◆ Removal actions including characterization and excavation of contaminated soil and debris and all associated waste management activities such as loading dump trucks, roll offs, rail cars, super-sacks or other containers for waste transport, moving waste containers on the installation, temporary accumulation of waste on the installation, profiling, manifesting, and shipping material off site.
- ◆ Construction of site storm water retention pond or basins, stockpile areas, and general potential contaminated media associated with sorting, consolidation, and movement for storage or final disposal.
- ◆ Munitions and explosives of concern (MEC) standby and construction support, anomaly avoidance, MEC disposal, unexploded ordnance (UXO) scrap certification, and related MEC tasks prior to and during intrusive activities in areas with potential for encountering MEC.
- ◆ Site controls and security including but not limited to fence and other site controls installation, surveying, and other related support task.

The AHAs included with each SSHP describe the specific hazards and mitigations associated with these activities.

2.3 North Wind Safety Metrics

Table 3 provides a summary of the NWI Safety Metrics for the calendar year ending 2005.

Table 3. NWI Safety Metrics for the Calendar Year Ending 2005.

Hours Worked	Total Recordable Injuries	Total Recordable Illnesses	Recordable Injury Incidence Rate	Total Lost Time Injuries	Lost Time Injuries Incidence Rate	Days Away, Restricted or Transferred (DART)	Experience Modification Rate (EMR)
493,129	0	0	0.0	0	0.0	0	0.73

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3.0 NORTH WIND SAFETY AND HEALTH POLICY

The NWI safety and health policy is based on a sincere desire to eliminate personal injuries, occupational illnesses, environmental releases, damage to equipment and property, as well as to protect the general public.

Every employee and subcontractor of NWI is charged with the overall responsibility of preventing incidents and eliminating conditions that can lead to occupational injuries and illnesses. It is the NWI Project Manager's (PM's) responsibility to provide a safe work environment. Likewise, management can only give meaning to the Safety and Health Program if they take positive action to ensure that safety and health rules are adequate, enforced, and that effective training programs are employed.

NWI recognizes that nearly all occupational injuries and illnesses are preventable and that a high level of safety performance provides long-term beneficial returns, including healthy employees and a productive work environment. Therefore, safety will not be compromised. It is fully accepted as an integral part of the NWI organization and daily project activities. ***NWI's goal is ZERO occupational illnesses, injuries, or environmental releases.***

This APP adopts, by reference, the implementing procedures contained in the NWI *Corporate Health and Safety Program* including all implementing health and safety procedures (these are available to all North Wind personnel on the North Wind, Inc. Intranet) and the USACE Safety and Health Requirements Manual (EM 385-1-1), as appropriate for the scope of work being conducted.

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4.0 REPOSIBILITIES AND LINES OF AUTHORITY

4.1 North Wind as General/Prime Contractor

NWI will function as the general/prime contractor performing oversight during all project activities conducted during this project. All personnel involved with this project will follow the health and safety requirements set forth in this APP and applicable SSHP.

4.2 Corporate Health and Safety Responsibility

The corporate responsibility for the NWI *Corporate Health and Safety Manual* and implementing procedures rests with the North Wind Corporate Health and Safety Director (HSD) Mr. Bruce Miller. Mr. Miller reports directly to the President of North Wind, Inc. He is a Certified Industrial Hygienist (CIH) and will serve as the Project Safety and Health Manager. He has overall responsibility for project health and safety issues responsibilities include determining all medical surveillance requirements, providing technical guidance and regulatory interpretation to the NWI project manager, field team, and SSHO, and to ensure that all requirements of the this APP, the NWI *Corporate Health and Safety Manual*, and applicable SSHP are followed. The Project Safety and Health Manager will conduct site safety audits during the course of the project to ensure that the APP and applicable SSHP is being implemented correctly.

4.3 Site Safety and Health Officer

North Wind will appoint one or more SSHOs for this project depending on the complexity and hazards associated with project tasks taking place, the concurrent nature of project activities, and geographic location of individual project tasks. Each SSHO shall report directly to the North Wind's Project Safety and Health Manager and will have the specific training, knowledge, and experience required by EM 385-1-1 and necessary to implement the APP and associated SSHP to verify compliance with all applicable project safety and health requirements. The SSHO will have the primary responsibility of implementing and enforcing the APP and applicable SSHP, that includes verifying training requirements have been met, ensuring required personal protective equipment is worn, maintaining site controls and signage, and conducting periodic

safety inspections and audits and reporting deficiencies so corrective actions can be taken. In addition, SSHO may be responsible for conducting personal and area exposure monitoring and for maintaining accurate safety records. The SSHO will notify the North Wind PM and Project Safety and Health Manager prior to modifying any safety procedures detailed in the SSHP.

4.4 Lines of Authority

The organizational structure for this project reflects the resources and expertise required to perform the work, while minimizing risks to worker health and safety, the environment, and the general public. The names of the individuals in key roles at the site are defined in the individual SSHPs. Lines of responsibility and communication are shown on the organizational chart for the site (Figure 3).

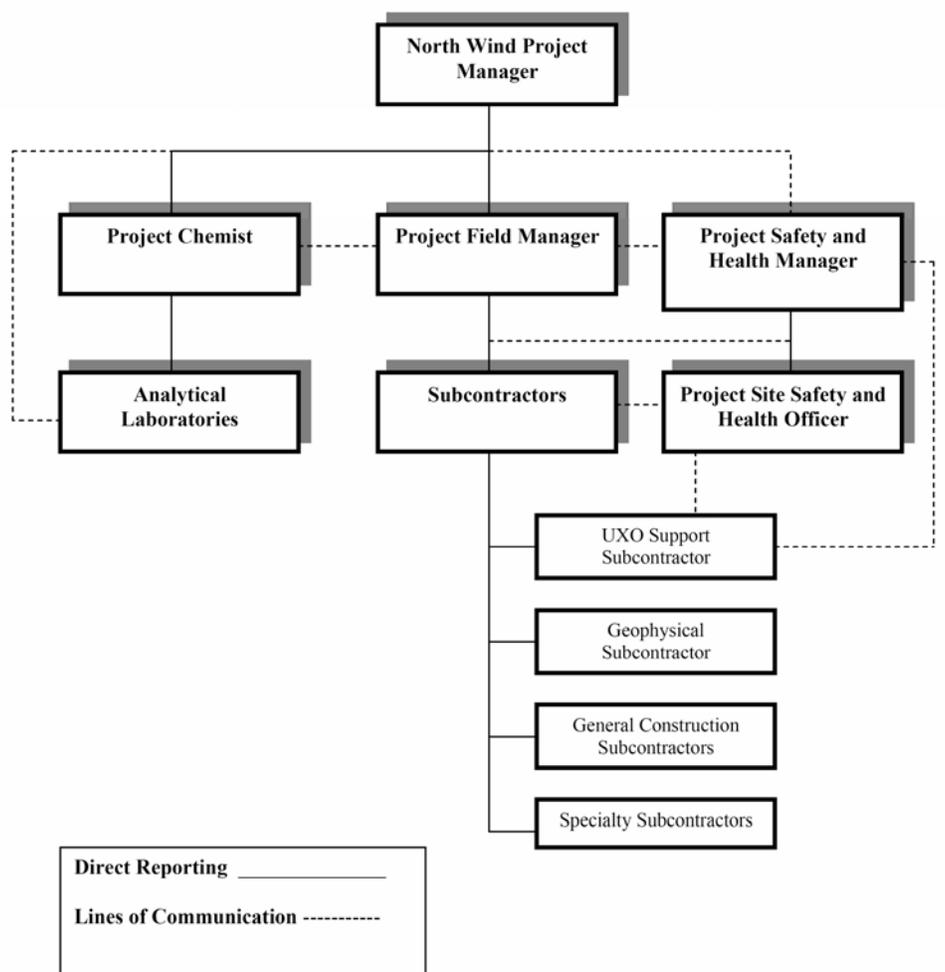


Figure 3. Project Lines of Authority and Communication

5.0 SUBCONTRACTORS AND SUPPLIERS

5.1 Identification of Subcontractors and Suppliers

NWI may utilize numerous subcontractors and suppliers to complete the project scope of work. Subcontracted services could include construction support, equipment rental, analytical laboratory (Severn Trent Laboratories), geophysical and other surveying, site control and fencing, professional technical services, MEC/UXO contractor support, and local vendors for project equipment and supplies.

5.2 Control of Subcontractors

NWI will provide contractual flow down terms and conditions to subcontractors based on the nature and scope of their services. On site subcontractors will designate a lead person who will serve as the single point of contact with the NWI field manager (FM) and PM to communicate with. Lines of authority for subcontractors are illustrated in Figure 3.

5.3 Safety Responsibilities of Subcontractors

All subcontractors will comply with the requirements established in this APP and applicable SSHP. Subcontractors shall be fully contracted, licensed and insured and shall follow all applicable USACE EM 385-1-1, Occupational Safety and Health Administration (OSHA), Environmental Protection Agency (EPA), and State of Alaska regulatory requirements associated with their scope of services. Where required, evidence of insurance and required licenses will be provided to the NWI PM prior to starting subcontracted tasks. In addition, subcontractor workers and supervisors shall attend the required APP and SSHP training and tailgate safety briefings and meet all other applicable training requirements specified by the SSHP. Each subcontractor will designate a single foreman, supervisor or point of contact with whom the NWI FM will communicate. Each subcontractor has sole responsibility for their employees.

The UXO construction and anomaly avoidance support will be provided by a qualified UXO Technician II or higher, as defined in USACE Engineer Pamphlet EP 1110-1-18. Reporting of any UXO will comply with EP 1110-1-18 and the established project Communication Plan. UXO personnel will report directly to the NWI FM.

NWI will observe subcontractors' safety performance to ensure compliance with this APP. Individual subcontractors are responsible for observation of hazards and unsafe practices of their personnel and taking the appropriate corrective action to eliminate or mitigate all hazards. All unsafe acts, conditions, or incidents will be brought to the attention of the NWI SSHO, PM, and NWI project safety and health manager as required. Health and safety related communications with North Wind and their subcontractors should be conducted as follows:

- ◆ Train all NWI and subcontractors personnel on the provisions of this APP. Allow them to read and review the APP and applicable SSHP prior to their beginning work.
- ◆ Subcontractors shall brief their project team daily on the hazards, associated mitigation, and emergency actions related to their scope of services.
- ◆ When apparent non-compliant or unsafe conditions or practices are observed, the SSHO or site manager will stop subcontractor work as necessary, then notify the subcontractor representative and require corrective action be taken. The subcontractor is responsible for determining and implementing necessary controls and corrective actions. Following any stop work action, subcontractor work will only commence when authorized by the NWI FM with concurrence from the SSHO and PM.
- ◆ If repeat non-compliant or unsafe conditions/acts are observed, subcontractor work will be stopped, the field manager notified, and corrective measures implemented. This may include removal of unsafe or non-complaint subcontractor personnel from the project site as deemed appropriate by the NWI SSHO and PM.
- ◆ When an apparent imminent danger exists, immediately stop work and remove all affected employees and subcontractors, notify the subcontractor representative, and stop the affected work until adequate corrective measures are implemented. Notify the NWI PM and project safety and health manager. Also, notify the USACE client project manager. Emergency contacts are also listed in Section 12 as appropriate based on the nature of the incident.
- ◆ Document verbal health and safety related communications in the project field logbook and communicate this information to appropriate project management personnel via email where appropriate.

Where subcontractors fail to comply with APP, SSHP or other contractual requirements, their contract may be terminated by NWI.

6.0 TRAINING

Training and project indoctrination will be conducted in accordance with this APP and the applicable SSHPs to provide information necessary to assure that personnel are aware of the hazards associated with the site tasks, activities to be performed, and the materials that they will be working with. All workers will be required to provide objective evidence of having met required training requirements as applicable to their tasks. A copy of training records, certificates, or cards shall be provided to the NWI PM prior to initiating project tasks or at the initial APP/SSHP briefing

Mandatory training requirements for this project include:

- ◆ APP Training
- ◆ AHA (or equivalent) Training
- ◆ Applicable SSHP Training
- ◆ Personal protective equipment (PPE) Training
- ◆ Hazardous waste operations and emergency response (HAZWOPER) training in identified contaminated areas (24-hour or 40-hour depending on the areas entered and nature of the activities to be conducted)
- ◆ Emergency Actions/Response Training (as described below) as apart of the APP training.

6.1 Site-Specific Work Scope and Health and Safety Training

All workers and subcontractors assigned to the project who enter NWI controlled work areas shall attend initial APP and applicable SSHP training. Prior to entering the work areas, all personnel shall also participate in a daily safety briefing. Visitors will receive project training based on their access requirements to the specific facility area. Visitors requesting access to North Wind controlled areas must have a demonstrated need to access the area and meet all other applicable APP, SSHP, USACE EM 385-1-1, OSHA required training requirements and have objective evidence (training certificates or cards) before entry to controlled areas will be allowed.

6.2 APP Briefing Content

The APP briefing shall include a review of the APP and applicable AHA. The applicable APP and SSHP including AHA, project-specific hazard communication information, and review of applicable Material Safety Data Sheets (MSDSs) for all chemical brought on site, and emergency actions. Additionally, personnel will review PPE requirements and the proper use and limitation of Level D PPE and any specialized equipment and applicable work control and safety procedures such as LO/TO or confined space.

6.3 Attendance Documentation

All attendees of the APP and SSHP training shall sign a training acknowledgment form (Attachment A) verifying their attendance and acknowledging the information that has been presented is understood and will be complied with. This briefing shall be held on or near the site during the mobilization phase of the project and before any work is started. Specialty subcontractors will be briefed prior to the start of their work tasks.

6.4 Daily Safety Briefings

Daily “tailgate” safety briefings shall be used to augment the APP and SSHP briefing and address site-specific concerns and any changes that arise during the course of the project. Prior to initiating project tasks, all personnel shall participate in a daily tailgate safety briefing.

Where separate project sites or activities prohibit all personnel from attending a single safety briefing, each work group will conduct a tailgate safety briefing. Documentation of attendance of the tailgate safety briefing shall be maintained in the FM’s logbook. All personnel and subcontractors are encouraged to contribute suggestions during tailgate safety briefings on how to more effectively and safely complete project tasks based on ongoing lesson learned for the duration of the project.

6.5 Equipment Operator Required Training and Qualifications

Documentation of the training and/or qualifications for equipment operators as required by 29 Code of Federal Regulations (CFR) 1926, Safety and Health Regulations for Construction

shall be provided to the NWI FM or PM as requested. Anticipated training certification or qualifications will be required as follows:

- ◆ Excavation competent person (29 CFR 1926, Subpart P)
- ◆ Crane Operator Competent Person (29 CFR 1926.550, “Cranes, Derricks, Hoists, Elevators, and Conveyors”)
- ◆ Rigger Competent Person (29 CFR 1926.251, “Rigging Equipment for Material Handling,” 29 CFR 1910.184, “Slings”)
- ◆ Heavy equipment operator (training qualification).

6.6 Hazard Communication

To ensure 29 CFR 1910.1200, Hazard Communications (HAZCOM) requirements are met, the following training and information will be provided. General hazard communication training will be provided as part of the applicable SSHP briefing. This will include the requirement for all subcontractors to provide the NWI FM with a copy of MSDSs for any chemical brought on site (**prior to use**), its intended use and potential to impact other project workers and activities, location of MSDS at the site, and PPE requirements for use of chemical products. Chemicals containing recognized carcinogens will not be brought on site or used without the approval of the NWI project safety and health manager. Subcontractors are responsible for providing HAZCOM training to their personnel and to provide the field manager with copies of objective evidence of HAZCOM training.

6.7 Subcontractors and All Site Visitors

All subcontractor personnel requiring unescorted access to NWI controlled work areas shall be briefed on the APP and applicable SSHP relevant daily safety briefing topics. Subcontractors will sign the appropriate APP and SSHP and other required training forms and wear a minimum of Level D PPE at all times or as required by the AHA for the area to be accessed.

Where subcontractors serve as OSHA-competent or qualified persons (OSHA 29 CFR 1926.32 definition) for specialty work (i.e., excavation, fall protection, scaffolds or cranes), the Subcontractor qualified person will provide objective evidence of training and qualifications to the FM and SSHO prior to serving in this capacity. Subcontractors are responsible for

compliance with all applicable USACE EM 385-1-1, OSHA, EPA, state, and federal requirements regardless if they are called out in this SSHP/APP or not.

Visitors will receive an abbreviated APP briefing on the general hazards, associated controls and site requirements, PPE requirements, and emergency actions. PPE training may also be conducted for visitors required to wear hard hats and safety glasses. Visitors who have not met the requirements for unescorted access will be escorted (line of sight) by the FM or designee at all times.

6.8 Emergency Response Training

Emergency Response Training requirements will include review of this APP/SSHP and training on all requirements listed in Section 12.2, “Emergency Response Plan.”

7.0 SAFETY AND HEALTH INSPECTIONS

Site safety and health inspections will be conducted throughout the project to verify compliance with the APP and applicable SSHP. Inspections may be conducted by the SSHO weekly and periodically in conjunction with the FM and PM. A standardized site inspection project form will be used to document the inspection. In addition, personnel assigned as competent persons for specific activities (i.e., excavation, lockout/tagout [LO/TO], or fall protection) will be responsible for conducting inspections in accordance with the applicable regulatory requirement.

Identified safety and health issues and deficiencies, and the actions, timetable, and responsibility for correcting the deficiencies, shall be recorded in inspection reports and reported to the FM, PM and project safety and health manager for tracking purposes. Where deficiencies can be immediately corrected, the SSHO and FM will take necessary actions to correct them. Pertinent information related to any deficiencies found, including the date, description of the deficiency, person responsible for correcting the deficiency, proposed deficiency resolution date, and actual date resolved, shall be documented. Follow-up inspections to ensure correction of any identified deficiencies shall be conducted and documented in a like manner using the same inspection forms.

Objective evidence of the identified competent person's and qualified personnel's training records for these positions will be submitted to the PM prior to initiating project tasks on site. Copies of these training records will be available for review by USACE project personnel.

No external inspections/certifications have been identified for this project.

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8.0 SAFETY AND HEALTH EXPECTATIONS, INCENTIVES PROGRAMS, AND COMPLIANCE

8.1 North Wind Corporate Safety and Health Goals

NWI recognizes that nearly all occupational injuries and illnesses are preventable and that a high level of safety performance provides long-term beneficial returns, including healthy employees and a productive work environment. Therefore, safety will not be compromised. Safety is fully accepted as an integral part of the NWI organization and daily project activities. *NWI's goal is ZERO occupational illnesses, injuries, or environmental releases.*

It is NWI policy to expect the highest degree of professionalism from its employees and subcontractors during the course of all projects. Starting at the hiring and subcontracting process, NWI interviews prospective employees and subcontractors to assess their safety awareness and attitude. This includes review of subcontractor recordable injury and illness/lost workday incidence rates and experience modification rates.

8.2 Safety Incentives

The primary incentive for conducting all work in a safe and healthful manner is continued success of NWI, which directly benefits every employee and subcontractor. Safety awards (e.g., jackets, gift certificates, or spot bonuses) are occasionally given out to highlight exceptional safety awareness or actions. However, excellence in safety performance is considered normal professional conduct and all incentive recommendations are reviewed and approved by the corporate HSD. Incentives are generally only awarded after the completion of a successful project, field season or calendar year after personnel have demonstrated consistently high safety standards and culture.

NWI has established an annual safety award for the NWI division with the best safety record and most innovative proactive safety awareness training and culture for employees and subcontractors. This award is presented to the division manager and PM during the annual NWI Manager's Meeting by the President of NWI.

8.3 Disciplinary Actions for Unsafe Acts

Disciplinary actions will be taken if an employee fails to follow NWI health and safety requirements. Actions range from a written reprimand to termination. Subcontractors who fail to follow APP, SSHP or NWI health and safety requirement are subject to contract termination. *Unsafe acts or environmental negligence will not be tolerated.*

8.4 Accountability for Safety and Health

The NWI *Corporate Health and Safety Program* describes how supervisors and PMs are held accountable for safety. The NWI President is responsible for the overall NWI health and safety program. The NWI Corporate HSD, Alaska Operation Manger, and PM have total accountability to the NWI President to ensure this project is conducted in a safe and complaint manner. This policy is communicated to the assigned FM, SSHO, and subcontractors who have the responsibility for implementing the respective portion of the NWI *Corporate Health and Safety Program* and APP requirements in the field.

All NWI personnel and subcontractors are responsible for their own safety and the safety of other individuals affected by their activities. These responsibilities include making a prompt report of any occupational injury, illness, spill/environmental release, or potential hazardous material exposure to the appropriate PM or FM. The NWI PM is responsible for assuring that employees or subcontractors are not subject to discrimination or reprisal for responsible safety actions.

9.0 ACCIDENT REPORTING

All accidents, no matter how minor, will be reported to the SSHO, FM, PM, HSM, and USACE PM immediately. Depending on the nature of the event, additional notifications and reporting will be required, as described below. The SSHO is responsible for collecting all information related to an on-site accident in accordance with NWI HSP-11-005, “Accident Reporting and Investigation,” including completion of a NWI Incident Report Form (Form 520). The SSHO will take immediate actions to mitigate any accident or medical actions, as described in Section 12. Except for rescue and emergency measures, the accident scene shall not be disturbed until it has been released by the investigating official.

The PM and NWI HSM will also be notified within 1 hour of any accidents on site. Additionally, accidents that appear to have any of the consequences listed below shall be immediately reported to the USACE PM and State of Alaska. These accidents, which will be investigated in depth to identify all causes and to recommend hazard control measures, include:

- ◆ Fatal injury,
- ◆ Permanent totally disabling injury,
- ◆ Permanent partial disabling injury,
- ◆ Three or more persons admitted to a hospital, or
- ◆ Property damage in an amount specified by USACE current accident reporting regulations.

These accidents will be investigated in depth to identify all causes and to recommend hazard control measures including completing an USACE ENG Form 3394, “U.S. Army Corps of Engineers Accident Reporting Form.”

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10.0 MEDICAL SUPPORT

10.1 First-Aid/CPR

At least one person (FM or SSHO) on site shall be first-aid/ cardiopulmonary resuscitation (CPR) trained (American Red Cross course or equivalent) during all active work periods. First aid will be provided on a voluntary basis and only within the level of training of the first aid provider on a voluntary basis. The names of the first-aid/CPR trained personnel will be communicated to all project personnel during the APP/SSHP briefing and to all new personnel during their initial APP briefing. Emergency medical treatment will be handled as described in Section 10.2.

10.2 Emergency Medical Treatment

In the event of a known or suspected injury or illness due to exposure to a hazardous substance, or physical agent, the worker(s) shall be evaluated by a first-aid/CPR trained worker and stabilized for transportation to and treatment at the Fairbanks Memorial Hospital Emergency Department. (See Section 12.4 for direction to the Medical Center.) If it is not safe to move the injured person, then they will be stabilized and treated for shock by a first aid/CPR trained worker until an ambulance arrives. An ambulance will be requested by calling 911. The procedures listed below may also be applied to non-emergency incidents. Injuries and illnesses, including overexposure to contaminants, must be reported to NWI FM, PM, HSD, Human Resources and USACE PM. If there is doubt about whether medical treatment is necessary, or if the injured person is reluctant to accept medical treatment, contact the NWI medical consultant. During non-emergencies, follow these procedures (as appropriate):

- ◆ Notify appropriate emergency response authorities.
- ◆ The SSHO will assume charge during a medical emergency until the ambulance arrives or until the injured person is admitted to the emergency room.
- ◆ Prevent further injury, as possible.
- ◆ Administer first aid (voluntary basis), as necessary. Note: Only those trained in first aid and CPR should administer first aid.
- ◆ Get medical attention for the injured person immediately.

- ◆ Perform decontamination where feasible; however, lifesaving and first aid or medical treatment take priority.
- ◆ Make certain that the injured person is accompanied to the emergency room.
- ◆ When contacting the medical consultant, state that the situation is a NWI matter and give your name and telephone number, the name of the injured person, the extent of the injury or exposure, and the name and location of the medical facility where the injured person was taken.

Report incident as outlined in Section 9.

10.3 Medical Surveillance Requirements

Based on the nature of the work scope at the Stryker Brigade sites, planned activities to be performed, and past exposure monitoring during the 2005 field season, it is not anticipated that any OSHA 29 CFR 1926 or 29 CFR 1910, Subpart Z substance-specific medical surveillance requirements apply. Where use for certain PPE (i.e., respiratory protection) triggers OSHA medical surveillance, all applicable requirements will apply. Specific medical surveillance requirements are provided in the SSHP (Appendix A).

11.0 PERSONAL PROTECTIVE EQUIPMENT

The NWI HSD is responsible for conducting the hazard analysis and for selecting the required PPE requirements for all NWI projects in accordance with NWI HSP-11-001, “Project Hazard Analysis,” 29 CFR 1910.132, *Personal Protective Equipment*, and EM 385-1-1. Selected PPE requirements are documented in the Project AHA(s) and SSHP. Additional PPE-specific requirements for selection, use, and maintenance of respirators, fall protection, etc. are provided in NWI health and safety procedures and in the SSHP. All medical surveillance requirements associated with PPE will be followed in accordance with NWI HSP-11-006, “Medical Surveillance Requirements.”

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12.0 PLANS REQUIRED BY THE SAFETY MANUAL

A cross reference of applicable EM 385-1-1 required plans is provided in Table 4.

Table 4. Safety Manual Required Plans

EM 385-1-1 Section	NWI HSP or SSHP Section Addressing Hazard Area
Layout plans (04.A.01)	Not applicable to this project
Emergency response plans	APP Attachments 3 & 4; SSHP Section 11
Hazard Communication Program (01.B.06)	NWI HSP-11-002; APP Attachment 7; SSHP Section 2
Respiratory protection plan (05.E.03)	NWI HSP-11-007; APP Attachment 11; SSHP Section 2
Health hazard control program (06.A.02)	SSHP Section 2
Lead abatement plan (06.B.05 & specifications)	Not applicable to this project
Asbestos abatement plan (06.B.05 & specifications)	Not applicable to this project
Abrasive blasting (06.H.01)	Not applicable to this project
Confined space (06.I)	Not applicable to this project
Hazardous energy control plan (12.A.07)	NWI HSP-11-012; SSHP Section 2
Critical lift procedures (16.C.18)	Not applicable to this project
Contingency plan for severe weather (19.A.03)	Not applicable to this project
Access and haul road plan (8.D.1)	Not applicable to this project
Demolition plan (engineering and asbestos surveys) (23.A.01)	Not applicable to this project
Emergency rescue (tunneling) (26.A.05)	Not applicable to this project
Underground construction fire prevention and protection plan (26.D.01)	Not applicable to this project
Formwork and shoring erection and removal plans (27.B.02)	Not applicable to this project
Lift slab plans (27.D.01)	Not applicable to this project

Table 4. Safety Manual Required Plans

EM 385-1-1 Section	NWI HSP or SSHP Section Addressing Hazard Area
Blasting plan (29.A.01)	Not applicable to this project
Diving plan (30.A.13)	Not applicable to this project
Plan for Prevention of alcohol and Drug abuse	NWI-HSM
Fall protection plan (Section 21)	APP Attachment 13 (NWI HSP-11-014); SSHP Section 2
Steel erection plan (27.E.01)	Not applicable to this project
Night operations lighting plan (16.C.19.d)	Not applicable to this project
Site sanitation plan (Section 02)	SSHP Section 2
Fire Prevention Plan (09.A.01)	SSHP Section 2

13.0 CONTRACTOR INFORMATION

A cross reference of applicable EM 385-1-1 APP required Sections is provided in Table 5.

Table 5. EM 385-1-1 Accident Prevention Plan Sections (minimum)

EM 385-1-1 Accident Prevention Area Section	NWI HSP or SSHP Section Addressing Hazard Area
Excavations	APP Attachment 12 (NWI HSP-11-011); SSHP Section 2
Scaffolding	Not applicable to this project
Medical and first-aid requirements	APP Attachment 10 (NWI HSP-11-006); SSHP Section 6
Sanitation	APP Attachment 11 (NWI HSP-11-007); SSHP Section 11
PPE	APP Attachment 8 (NWI HSP-11-003); SSHP Section 5
Fire prevention	SSHP Section 2
Machinery and mechanized equipment	SSHP Section 2
Electrical safety	SSHP Section 2
Public safety requirements	SSHP Section 2
Chemical, physical agent, and biological occupational exposure prevention requirements	SSHP Section 2

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14.0 SITE-SPECIFIC HAZARDS AND CONTROLS

A general hazards AHA for the project is provided in Attachment 2. The SSHP in Appendix A contains AHAs specific to these scopes of work.

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15.0 REFERENCES

- 29 CFR 1910.132, 2002, Title 29, “Labor,” Part 1910, “Occupational Safety and Health Administration,” Subpart I, “Personal Protective Equipment,” Section 1910.132, “General Requirements,” *Code of Federal Regulations*, Office of the Federal Register.
- 29 CFR 1910.184. Title 29, “Labor,” Part 1910, “Occupational Safety and Health Standards,” Subpart N, “Materials Handling and Storage,” Section 184, “Slings,” *Code of Federal Regulations*, Office of the Federal Register.
- 29 CFR 1910.1200. Title 29, “Labor,” Part 1910, “Occupational Safety and Health Standards,” Subpart Z, “Toxic and Hazardous Substances,” Section 1200, “Hazard Communication,” *Code of Federal Regulations*, Office of the Federal Register.
- 29 CFR 1910 Subpart Z. Title 29, “Labor,” Part 1910, “Occupational Safety and Health Standards,” Subpart Z, “Toxic and Hazardous Substances,” *Code of Federal Regulations*, Office of the Federal Register.
- 29 CFR 1926.32. Title 29, “Labor,” Part 1926, “Safety and Health Regulations for Construction,” Section 32, “Definitions,” *Code of Federal Regulations*, Office of the Federal Register.
- 29 CFR 1926.251. Title 29, “Labor,” Part 1926, “Safety and Health Regulations for Construction,” Section 251, “Rigging Equipment for Material Handling,” *Code of Federal Regulations*, Office of the Federal Register.
- 29 CFR 1926.550. Title 29, “Labor,” Part 1926, “Safety and Health Regulations for Construction,” Section 550, “Cranes and Derricks,” *Code of Federal Regulations*, Office of the Federal Register.
- 29 CFR 1926, Subpart P. Title 29, “Labor,” Part 1926, “Safety and Health Regulations for Construction,” Subpart P, “Excavations,” *Code of Federal Regulations*, Office of the Federal Register.

USACE, 2000. *Engineering and Design – Ordnance and Explosives Response*, Department of the Army, U.S. Army Corps of Engineers, EP 1110-1-18, April 24, 2000.

USACE, 2003. *Safety – Safety and Health Requirements*, Department of the Army, U.S. Army Corps of Engineers, EM 385-1-1, November 3, 2003.

16.0 ATTACHMENTS

Attachment 1	APP Training Acknowledgement Form
Attachment 2	General Project Activity Hazards Analysis
Attachment 3	Emergency Contacts List
Attachment 4	Emergency Route to the Medical Facility
Attachment 5	NWI Corporate Health and Safety Manual
Attachment 6	NWI Health and Safety Procedure (HSP)-11-001, Project Hazards Analysis
Attachment 7	NWI HSP-11-002, Hazard Communication
Attachment 8	NWI HSP-11-003, Personal Protective Equipment
Attachment 9	NWI HSP-11-005, Accident and Incident Reporting
Attachment 10	NWI-HSP-11-006, Medical Surveillance
Attachment 11	NWI-HSP-11-007, Respiratory Protection
Attachment 12	NWI-HSP-11-011, Excavation
Attachment 13	NWI-HSP-11-012, Control of Hazardous Energy (LO/TO)
Attachment 14	NWI-HSP-11-014, Fall Protection

17.0 APPENDICES

Appendix A	Site-Specific Safety and Health Plan – Delineation and Remediation of Contaminated Soil, Groundwater and Debris at Stryker Brigade Cantonment Areas
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NORTH WIND, INC.
ACCIDENT PREVENTION PLAN
ATTACHMENT 1
TRAINING ACKNOWLEDGEMENT FORM

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NORTH WIND, INC.
ACCIDENT PREVENTION PLAN
ATTACHMENT 2
ACTIVITY HAZARDS ANALYSIS

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JOB SAFETY ANALYSIS

Job Name	FTW Stryker Brigade Cantonment Areas Project	Effective Date	6/10/2006	JSA Number	FTW-STRYKER-2006-001	Revision	0
Job Site	FTW Stryker Brigade Cantonment Areas Project at Ft. Wainwright	Expiration Date	6/10/2008	Approved By	B. Miller, CIH, Project HSM		
				Project Mgr.	A. Armstrong		
				SSO	D. McGauhey or A. Armstrong		
Job Description	FTW Stryker Brigade Cantonment Project APP General Tasks						
Required Training	<p>Ft. Wainwright SSHP</p> <p>This JSA</p> <p>HAZWOPER 40-Hour Training (as required by individual SSHP and as posted)</p> <p>HAZWOPER 24-Hour Training (as required by individual SSHP and as posted)</p> <p>Construction Safety (for specific construction area entered)</p> <p>PPE per 29 CFR 1910.132 for PPE to be worn</p>						
Required PPE	<p>Level D - MINIMUM REQUIREMENT (standard work clothing, sturdy leather boots, safety glasses, and hard hat as posted and where overhead hazards exist)</p> <p>Modified Level D (as required by individual SSHP for specific tasks or when entering contaminated areas, see task-specific PPE)</p> <p>Level C (as required by individual SSHP for specific tasks or when action levels are exceeded, see task-specific PPE)</p> <p>PPE Component Design Standards/Criteria:</p> <ul style="list-style-type: none"> • Eye and Face Protection: 29 CFR 1910.133, ANSI Z87.1-2003 • Foot Protection: 29 CFR 1910.136, ANSI Z41-1991 (minimum requirement - sturdy leather boots above the ankle or equivalent) • Head Protection: 29 CFR 1910.135, ANSI Z89.1-1986 • Hand Protection: 29 CFR 1910.138 • High visibility vest or equivalent (reflective vest if working before or after daylight hours) • Respiratory Protection: 29 CFR 1910.134, (per individual SSHP based on airborne contaminant(s) concentration) <p>This JSA serves a written hazard assessment in accordance with 29 CFR 1910.132.</p>						



JOB SAFETY ANALYSIS

Activity No.	Discrete Activities or Subtask	Potential Hazards	Hazard Control/PPE
1	Fencing Tasks - Installing - Maintaining - Removing	1. Slip and Fall 2. Backstrain 3. Struck-by/Caught-between 4. Overhead hazards 5. Heat/Cold Stress 6. Pinch Points 7. High Noise Levels 8. PCB/Contaminants 9. Underground Utilities	1. Identify slip and fall hazards such as open excavations, uneven slopes and terrain, construction materials and debris on ground surface, observe ground when carrying materials, wear footwear with adequate tread 2. Use mechanical lifting device for post installation and removal where possible, two person lifting if object exceeds 50 pounds or is awkward, do not exceed maximum manual lifting limit of 50 pounds or 1/3 person's body weight (whichever is less), use two persons to pound posts as needed. Do not handle fence sections with fabric in high winds. 3. Use spotter for backing, wear high visibility reflective vests, only the equipment operator near posts to rig for removal, qualified operator, stage/stack fence posts secure configuration. DO NOT position body between bucket/boom and equipment or approach equipment from operator blind spot, avoid swing radius, and maintain communication with operator at all times. 4. Wear hard hat when using around construction equipment (e.g., backhoe) 5. SSHO or lead will check forecast and brief at pre-job briefing, wear adequate clothing including water proof outer garments, take warm-up/cool down breaks as needed, take breaks in temperature conditioned area, stay hydrated, SSHO to monitor workers for signs and symptoms of heat/cold stress 6. Wear leather gloves for material handling tasks, body position awareness, avoid placing hands under or between equipment or loads in motion. 7. Wear hearing protection when operating or near backhoe or similar equipment 8. Obey posted PCB area restrictions and follow SSHP requirements for entry including wearing all required PPE. 9. Obtain utility clearances or locates from Ft. Wainwright and construction contractor before driving posts below 12 inches PPE: Level D: (including leather gloves and hard hat when installing fence or where overhead hazards exist or as posted)
2	General Housekeeping Tasks	1. Slip and Fall 2. Back strain 3. Heat/Cold Stress 4. Pinch points 5. High noise levels 6. PCB/Contaminants	1. Identify slip and fall hazards such as open excavations, uneven slopes and terrain, construction materials and debris on ground surface, observe ground when carrying materials, wear footwear with adequate tread 2. Use mechanical lifting device for post installation and removal where possible, two person lifting if object exceeds 50 pounds or is awkward, do not exceed maximum manual lifting limit of 50 pounds or 1/3 person's body weight (whichever is less), use two persons to pound posts as needed. Do not handle fence sections with fabric in high winds. 3. SSHO or lead will check forecast and brief at pre-job briefing, wear adequate clothing including water proof outer garments, take warm-up/cool down breaks as needed, take breaks in temperature conditioned area, stay hydrated, SSHO to monitor workers for signs and symptoms of heat/cold stress



JOB SAFETY ANALYSIS

Activity No.	Discrete Activities or Subtask	Potential Hazards	Hazard Control/PPE
			4. Wear leather gloves for material handling tasks, body position awareness, avoid placing hands under or between equipment or loads in motion. 5. Wear hearing protection when operating or near operating equipment or noise levels >84 dBA 6. Obey posted PCB area restrictions and follow SSHP requirements for entry including wearing all required PPE. PPE: Level D: (including leather gloves and hard hat when installing fence or where overhead hazards exist or as posted)
3	Mobilizing / Demobilizing - Setting/removing trailers - Offloading/loading equipment and tools - Setting up/taking down site controls - Miscellaneous tasks	1. Slip and Fall 2. Backstrain 3. Heat/Cold Stress 4. Pinch Points/Rotating Parts 5. PCB/Contamination 6. High Noise Levels 7. Underground Utilities 8. Electrical	1. Identify slip and fall hazards such as open excavations, uneven slopes and terrain, construction materials and debris on ground surface, observe ground when carrying materials, wear footwear with adequate tread 2. Use mechanical lifting devices where possible, two person lifting if auger exceeds 50 pounds or is awkward, do not exceed maximum manual lifting limit of 50 pounds or 1/3 person's body weight (whichever is less). 3. Site supervisor or lead will check forecast and brief at pre-job briefing, wear adequate clothing including water proof outer garments, take warm-up breaks as needed, stay hydrated, monitor other workers for signs and symptoms of cold stress in accordance with FTW Soils SSHP 4. Wear leather gloves for material handling tasks, body position awareness. 5. Identify areas of high contamination, avoid direct contact with contaminated soil through use of PPE, keep soil wet to reduce airborne dusts and particulates, monitoring airborne contaminants, use standard decontamination techniques 6. Avoid contact with gasoline mix when fueling auger, let auger cool before filling and remove any ignition sources from area, position body upwind during fueling task 7. Wear hearing protection when operating or near powered hand auger 8. Obtain utility clearances or locates from Ft. Wainwright and construction contractor before driving anchors below 12 inches 9. Use licensed electrician for all utility tie-ins. Coordinate utility work with Ft. Wainwright and USACE personnel. PPE: Level D: (including leather gloves and hard hat when installing fence or where overhead hazards exist or as posted)

NORTH WIND, INC.
ACCIDENT PREVENTION PLAN
ATTACHMENT 3
EMERGENCY CONTACTS

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EMERGENCY CONTACTS

Accident Prevention Plan

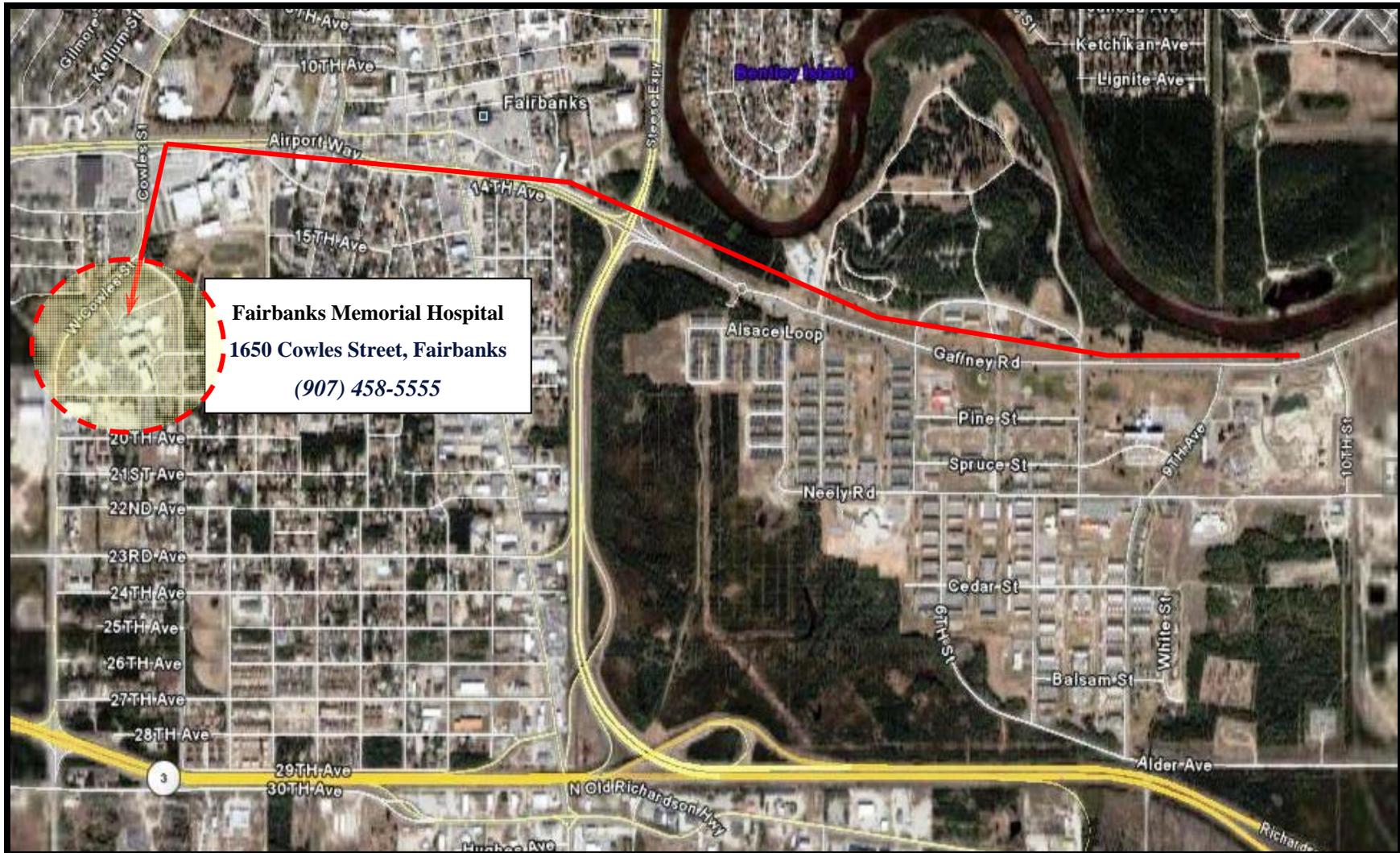
North Wind, Inc.
24-Hour Emergency Telephone Numbers
Day (907)277-5488 — Night (907) 338-9448

Project Name: Ft. Wainwright Stryker Brigade Cantonment Area	Project Number: 2316
Medical/Fire/Spill Emergency : 911	Local Occupational Physician: None
Security & Police – 8-911 353-7889 (non-emergency)	North Wind Health and Safety Director/Project HSM Name: Bruce Miller Phone: (208) 557-7900 Cell: (208) 520-4644 24-hour emergency phone: (208) 520-4644
Utilities Emergency Water: Charles Davenport, 353-7139 Gas: Charles Davenport, 353-7139 Electric: Charles Davenport, 353-7139	Project Manager Name: Aran Armstrong Phone: 907-322-4736
Site Safety & Health Officer (SSHO) Name: Dan McGauhey Phone: (907) 441-7750 Cell: 208-521-9928	Corporate Human Resources Department Name: Tara Gartrell Phone: (208) 557-7912
	Worker's Compensation and Auto Claims Initial Claims: Tara Gartrell Phone: (208) 557-7912 After hours: (208) 522-7953 Report fatalities AND report vehicular accidents involving pedestrians, motorcycles, or more than two cars.
Federal Express Dangerous Goods Shipping Phone: (800) 238-5355 North Wind Emergency Number for Shipping Dangerous Goods Phone: (208) 528-8718	Worker's Compensation and Auto Claims Fremont industrial Indemnity Phone: (907) 762-6700 Report fatalities AND report vehicular accidents involving pedestrians, motorcycles, or more than two cars.
Contact the Project Manager. Generally, the Project Manager will contact relevant government agencies.	
Facility Alarms: -NA	Evacuation Assembly Area(s): On-site and offsite assembly points will be designated before work begins
Facility/Site Evacuation Route(s): Evacuation routes will be designated by the SSHO before work begins.	
Hospital Name/Address: Fairbanks Memorial Hospital	Hospital Phone #: 911 458-5555 (Non-emergency)
Directions to Hospital: Attachment 3 on the following page presents routes to Hospital.	

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NORTH WIND, INC.
ACCIDENT PREVENTION PLAN
ATTACHMENT 4
EMERGENCY ROUTE TO MEDICAL FACILITY
(FAIRBANKS MEMORIAL HOSPITAL)

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Emergency Route from Ft. Wainwright to Fairbanks Memorial Hospital.

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NORTH WIND, INC.
ACCIDENT PREVENTION PLAN
ATTACHMENT 5
NORTH WIND CORPORATE HEALTH AND SAFETY MANUAL

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NWI-HSM

North Wind, Inc. Health and Safety Manual

Revision 1

August 28, 2006

Approved:

Bruce Miller (See letter number 156)
Health and Safety Director

08/21/06
Date

Sylvia Medina (See letter number 156)
President

08/21/06
Date



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DEFINITIONS

None

ACRONYMS

CPR	Cardiopulmonary Resuscitation
DOD	Department of Defense
DOE	Department of Energy
EPA	Environmental Protection Agency
HSP	Health and Safety Plan
HRD	Human Resources Director
HSD	Health and Safety Director
HSM	Health and Safety Manual
MSDS	Material Safety Data Sheet
NRC	Nuclear Regulatory Commission
NWI	North Wind, Inc.
OSHA	Occupational Safety and Health Administration
SSO	Site Safety Officer
THA	Task Hazard Analysis

1. PURPOSE

The purpose of this North Wind, Inc. (NWI) Health and Safety Manual (HSM) is to provide general health and safety guidelines for conducting all work activities. This policy is based on a sincere desire to eliminate personal injuries, occupational illnesses, environmental releases, damage to equipment and property, as well as to protect the general public.

2. SCOPE

Every employee and subcontractor of North Wind is charged with the overall responsibility of preventing incidents and eliminating conditions that can lead to occupational injuries and illnesses. It is the North Wind project manager's responsibility to provide a safe work environment. Likewise, management can only give meaning to the HSM program if it takes positive action to ensure that safety and health rules are adequate, enforced, and that effective training programs are employed.

North Wind recognizes that all occupational injuries and illnesses are preventable, and that a high level of safety performance provides long-term beneficial returns, including healthy employees and a productive work environment. Therefore, safety will not be compromised. It is fully accepted as an integral part of the North Wind organization and daily project activities. *Our goal is ZERO occupational illnesses, injuries or environmental releases.*

3. RESPONSIBILITIES

The North Wind President is responsible for the overall HSM Program and assigns project managers, site safety officers (SSOs), and site supervisors the responsibility for implementing HSM Programs and for maintaining a safe work environment at each project site.

The North Wind president has assigned to the corporate Health and Safety Director (HSD) the responsibility to identify the HSM regulatory requirements; develop programs and procedures to meet these requirements; to interpret HSM requirements (in concert with various technical and medical resources); and to approve variances from these North Wind HSM requirements. Additionally, the North Wind president, corporate HSD, assigned project manager, or supervisor conducts periodic audits (as warranted) to ensure the implementation of HSM Programs.

All North Wind employees are responsible for their own safety and the safety of other individuals affected by their activities. These responsibilities include making a prompt report of any occupational injury, illness, spill/environmental release, or potential hazardous material exposure to the appropriate project manager or site supervisor. North Wind Management is responsible for assuring that employees or subcontractors are not subject to discrimination or reprisal for responsible safety actions.

4. NORTH WIND HEALTH AND SAFETY MANUAL

The North Wind HSM Policy is implemented and administered by Health and Safety Procedures (HSPs). HSPs are based on Occupational Safety and Health Administration (OSHA), Environmental Protection Agency (EPA), Nuclear Regulatory Commission (NRC),

Department of Defense (DOD), and Department of Energy (DOE) regulatory requirements. HSPs are written to ensure all North Wind employees and subcontractors are provided with a safe and healthful workplace and for protection of the environment. The most current version of these HSPs can be viewed on the North Wind Intranet.

4.1 Work Area Jurisdiction

This HSM Program applies to all work areas under the jurisdiction of North Wind, whether or not employees of other organizations are also working in these areas. Likewise, the program applies to North Wind employees working in areas under the jurisdiction of other organizations.

Note: Plant, facility or project sites may have HSM requirements in addition to those in this North Wind HSM Program Manual or a site-specific health and safety plan (HASP) may be written for a particular project site (i.e. hazardous waste operations and emergency response [HAZWOPER] projects). All applicable HSM requirements for each project site will be followed. Where duplicate requirements exist, the more restrictive will generally be followed unless determined inappropriate for a particular project site.

North Wind subcontractors whose employees work in areas under the jurisdiction of North Wind will be required to (1) have effective HSM Programs and/or safety and health plans that have been reviewed by the North Wind project manager and (2) accept HSM program oversight from the North Wind project manager or designated safety and health representative for the work site. These subcontractor conditions are ensured through inclusion in all contracts.

4.2 Safety Awareness and Accident Prevention

North Wind is dedicated to maintaining an internal safety culture by encouraging all employees to submit suggestions on how to improve current procedures and programs and to identify potential hazards. Every employee has stop-work authority if they perceive unsafe work conditions or witness unsafe acts. All site activities will cease until the unsafe condition is abated or a clear understanding of work controls is communicated to all employees. Additionally, the buddy system is implemented at each job site as a secondary mechanism to provide for protective equipment checks, hazard awareness, and foster better communication between all site workers.

All North Wind employees who engage in field projects are trained to the HSM Program Manual and the project-specific HASP to maximize hazard awareness and to ensure the potential for accidents or exposures is minimized. North Wind recognizes that all equipment and every project site has inherent risk but these can be mitigated by expecting all employees to follow and supervisors to enforce established North Wind HSM Program and site requirements while conducting activities.

4.3 Hazard Evaluations

All project tasks are identified prior to commencing site activities to evaluate potential physical, chemical, biological, and radiological hazards. This is accomplished by using project hazard analysis in accordance with HSP-001, Project Hazard Analysis. Project hazard analysis documentation is prepared for each major activity and all high consequence activities for every

project. This documentation is used as a training tool to inform employees of project hazards and controls and also forms the basis for the hazards evaluation section of each project HASP (as required). Additionally, action limits and hold points are identified where work activities are halted. Contingencies for further hazard evaluations, implementation of engineering controls, or the use of personal protective equipment (as a last option) are then determined.

4.4 Employee and Subcontractor Training

All North Wind employees are provided with general, project-specific, and hazard-based specialized health and safety training. General health and safety training consists of North Wind HSM policy and programs training, as well as identifying health and safety professionals within or associated with the company, who are available to answer specific technical questions. North Wind employees are also trained in the recognition, safe use/handling, and protection from all hazardous substances that they may come into contact with. Material safety data sheets (MSDS) are available at each project site for all such substances or materials in accordance with OSHA's Hazard Communication Standard.

Project-specific training for all HAZWOPER field activities is also provided in accordance with individual HASPs and applicable OSHA substance-specific regulatory requirements. This training is conducted prior to commencing field activities, when performing non-routine tasks, and when new hazards are identified and both North Wind employees and subcontractor personnel receive it. It includes ensuring MSDSs are available at the location of storage or use of the materials, along with training personnel in the use of such materials. MSDSs will be made available for all chemicals and hazardous substances, including those brought to the site and hazardous waste or substances present at the project site. Project-specific MSDSs are placed in the MSDS binder at the project site or are included as attachments or appendices to project HASPs (as required). This training is documented for each project.

Finally, hazard-based specialized courses are also taught based on project-specific requirements and to provide project managers/supervisors with enhanced hazard recognition, evaluation and control skills. Courses may include: radiological worker/hazards, confined space entry, competent person training, construction safety, respiratory protection, hazardous waste operations, environmental regulations, first aid/cardiopulmonary resuscitation (CPR), hearing protection, task hazard analysis, and other project related subjects.

4.5 Health and Safety Meetings and Briefings

A site-specific, pre-job health and safety meeting is held prior to initiating project field activities to review the HSP and other requirements. Additionally, daily pre-job safety briefings are conducted to discuss activities, associated hazards, prevention measures, protective equipment, exposure monitoring, emergency actions, and problems/lesson learned from the previous shift or day. Employees are encouraged to submit ideas on how to perform tasks in a safer and more efficient manner. These meetings are documented and all subcontractor personnel and North Wind employees in attendance sign the briefing sheet.

4.6 Health and Safety Inspections and Audits

Inspections to ensure the implementation of North Wind HSM requirements are conducted periodically by the North Wind President, Corporate Health and Safety Manager, SSO, project

manager or site supervisor. Employees also are empowered to continuously identify unsafe conditions or environments and report them to the SSO, project manager or site supervisor. Some of the items inspected include; general site safety, emergency equipment, hazardous materials on site, decontamination equipment, equipment and tools, and personal protective equipment. Compliance with North Wind's HSM requirements, project HASP (if required), and other regulatory requirements are inspected and any discrepancies identified are documented in the project logbook for immediate corrective action. (If an immediate corrective action is not possible, all project personnel are informed of the discrepancy and the project work directly affected by the hazardous condition, is temporally stopped until the hazard has been eliminated, isolated or controlled in some acceptable manner).

4.7 Accident Investigations

The Human Resources Director (HRD) (208-528-8718) will be contacted immediately following any accident, injury or environmental release. An investigation, commensurate with the severity of the event, will be performed for all occurrences (including near misses and first aid cases). HSP-005, Accident and Incident Reporting will be followed. As a minimum, the site supervisor or project manager, and all subcontractor and North Wind employees involved, are required to meet and discuss the incident to determine the root cause and what corrective actions must be taken to prevent future occurrences. Details from the investigation are documented on a North Wind Incident Report Form (HSF-005.1) (available on the North Wind Intranet). The original will be sent to the HRM and a copy kept in the project file. Corrective actions and recommendations following the investigation are discussed with all project personnel (including subcontract personnel) prior to continuing site activities. Drug and alcohol testing will be conducted following all accidents. All injuries or illnesses will be evaluated to determine if it is an OSHA recordable injury or illness and should be entered on the OSHA 300 Log (as required under 29 CFR 1904).

4.8 Incentive and Disciplinary Program

It is the policy of North Wind to expect the highest degree of professionalism from its employees and subcontractors during the course of all projects. Starting at the hiring and subcontracting process, North Wind interviews prospective employees and subcontractors to assess their safety awareness and attitude. This includes review of subcontractor recordable injury and illness/lost workday incidence rates and experience modification rates. The primary incentive for conducting all work in a safe and healthful manner is continued success of North Wind, which directly benefits every employee and subcontractor. Safety awards are occasionally given out to highlight exceptional safety awareness or actions.

North Wind has established an annual Safety Award for the office with the best safety record and most innovative proactive safety awareness training for employees and subcontractors. This award is presented to the winning office manager during the annual North Wind managers meeting by the President of North Wind.

If an employee fails to follow North Wind HSM and project-specific Health and Safety requirements, then disciplinary actions will be taken. Actions will range from a written reprimand to termination. Subcontractors who fail to follow North Wind HSM requirements are subject contract termination. ***Unsafe acts or environmental negligence will not be tolerated.***

4.9 Drug Free Workplace

North Wind is committed to providing the safest practical work environment for its employees. Accordingly, it is the policy of North Wind to maintain a drug-free workplace. North Wind will not hire and or retain employees who use, possess or sell illegal substances. Additionally, North Wind will not tolerate abuse of legal substances that adversely affect work safety, productivity, or an employee's overall performance. North Wind reserves the right to conduct post-accident drug and alcohol testing of all employees.

5. HEALTH AND SAFETY PROCEDURES

The following Health and Safety Procedures (HSPs) implement the North Wind Health and Safety Manual:

- HSP-001, Project Hazard Analysis
- HSP-002, Hazard Communication
- HSP-003, Personal Protective Equipment
- HSP-004, Accident Prevention
- HSP-005, Accident Reporting and Investigation
- HSP-006, Medical Surveillance
- HSP-007, Respiratory Protection
- HSP-008, Hearing Conservation Program
- HSP-010, Confined Space Entry
- HSP-011, Excavation
- HSP-012, Control of Hazardous Energy
- HSP-013, Motor Vehicle and ATV Safety
- HSP-014, Fall Protection

6. RECORDS

The HSD will maintain the following records and all records pertaining to this manual in accordance with QAP-171, Records Control, and all relevant Health and Safety Procedures:

- Material Safety Data Sheet
- HSF-005.1, Incident Report Form

7. REFERENCES

29 CFR 1904

HSF-005.1, Incident Report Form

HSP-001, Project Hazard Analysis

HSP-002, Hazard Communication

HSP-003, Personal Protective Equipment

HSP-004, Accident Prevention

HSP-005, Accident Reporting and Investigation

HSP-006, Medical Surveillance

HSP-007, Respiratory Protection

HSP-008, Hearing Conservation Program

HSP-010, Confined Space Entry

HSP-011, Excavation

HSP-012, Control of Hazardous Energy

HSP-013, Motor Vehicle and ATV Safety

HSP-014, Fall Protection

Material Safety Data Sheet

OSHA 300 Log

QAP-171, Records Control

NORTH WIND, INC.
ACCIDENT PREVENTION PLAN
ATTACHMENT 6
NWI HEALTH AND SAFETY PROCEDURE (HSP)-11-001
PROJECT HAZARDS ANALYSIS

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HSP-001

Project Hazard Analysis

Revision 1

August 28, 2006

Approved:

Bruce Miller (See letter number 156)
Director, Health and Safety

08/21/06
Date

Sylvia Medina (See letter number 156)
President

08/21/06
Date

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DEFINITIONS

Record Written or electronically completed or in-process forms, reports, deliverables, and other information that provides objective evidence that the quality system is followed and is effective.

ACRONYMS

GIS Geographical Information System

HAZWOPER Hazardous Waste Operations and Emergency Response

HSD Health and Safety Director

HSF Health and Safety Form

HSP Health and Safety Plan

JSA Job Safety Analysis

NWI North Wind, Inc.

SS Site Supervisor

SSO Site Safety Officer

THA Task Hazard Analysis

1. PURPOSE

This procedure provides guidance and direction on the process of preparing and approving field and laboratory project hazard analysis documentation for North Wind Inc. (NWI) controlled projects. The purpose for preparing these project hazard analysis documents is to:

- Define the project scope of work
- Identify the associated project hazards
- Evaluate and eliminate these hazards where feasible
- Provide hazard controls where hazards can not be eliminated.

2. SCOPE

This procedure applies to all NWI controlled field and laboratory projects and all personnel (NWI and subcontractors) participating with these projects. The project hazard analysis requirements represent the minimum hazard analysis to be completed for each project. Additional safety and hazard analysis documents may be required in accordance with Federal, State, or client directed requirements.

3. RESPONSIBILITIES

The project manager has the ultimate responsibility for ensuring that an adequate hazard analysis has been completed and approved for each project for which they have control. All hazards analysis documents will specify the appropriate mitigative engineering controls, administrative controls, and personal protective equipment required to minimize identified hazards.

4. PROCEDURE

4.1 Graded Approach to Project Hazard Analysis

A graded approach to project hazard analysis will be used on all NWI projects to adequately analyze the hazards and identify the appropriate mitigative measures. The type of hazard analysis will be based on the complexity of the project, nature of the hazards, and project or client contractual requirements.

Hazard analysis will be developed and documented based on the general criteria listed in Table 1. Contact the NWI Health and Safety Director (HSD) for clarification on what is the appropriate level of hazard analysis for a given project or activity.

Table 1. Hazard analysis general criteria.

Hazard Category	Project Hazard Analysis Documentation
Low Hazard Activities	HSF-001.1, Task Hazard Analysis
Moderate – High Hazard Activities	HSF-001.2, Job Safety Analysis
High Hazard Activities or when required by 29 CFR 1910.120/1926.65 (HAZWOPER)	Site-Specific Health and Safety Plan (HSP)

4.2 Hazard Analysis Document Development and Approval

To the extent possible, hazard recognition, identification, and mitigation will be the responsibility of the project supervisor and personnel performing the work. These individuals should provide input in the development and review process for hazard analysis documents. The hazard analysis will be based on the specific scope of work for each project and may require multiple analyses when a project consists of several phases or evolutions. Based on the graded approach, the individuals listed in Table 2 are responsible for completing and approving the associated hazard analysis documents.

Table 2. Individuals responsible for completing and approving hazard analysis documentation.

Project Hazard Analysis Document	Responsible Person for Document Preparation	Responsible Person for Document Approval
HSF-001.1, Task Hazard Analysis	Site Supervisor (SS)	SS/Project Safety Representative
HSF-001.2, Job Safety Analysis	Site Safety Officer (SSO) or SS	SS/Project Safety Representative
Site-Specific HSP	SSO or Health and Safety Manager	SS/NWI HSD or designee

4.3 Specific Hazard Analysis Documents

4.3.1 Task Hazard Analysis

As a minimum, HSF-001.1, Task Hazard Analysis (THA) will be completed for each field project task or phase where the project scope and activities present low hazards. Examples of these activities may include, but are not limited to, conducting archeological investigations, field geographical information system (GIS) mapping, or preliminary site visits to Hazardous Waste Operations and Emergency Response (HAZWOPER) sites.

NOTE: *THAs do not take the place of other facility or project required permits. See the “work permits” portion section of the “Controls” section of each THA for the required work permits.*

4.3.2 Job Safety Analysis

For moderate to high hazard projects or as required by the client, HSF-001.2, Job Safety Analysis (JSA) will be completed by the SSO or SS. The JSA will identify each task, the associated hazards, and specify the appropriate mitigative measures or controls. Mitigation may include, engineering controls, administrative controls, training, and personal protective equipment. Where projects have multiple phases or activities as part of the scope of work, each phase or activity will be evaluated using a separate JSA. Examples of activities where a JSA would be required may include, but are not limited to, conducting PowerProbe operations at limited petroleum contaminated sites, installation of monitoring wells, industrial operations in uncontaminated areas.

4.3.3 Site-Specific Health and Safety Plans

For projects where a site-specific HSP is required by [29 CFR 1910.120](#)/29 CFR 1926.65, “Hazardous Waste Operations and Emergency Response” a HSP or equivalent document meeting the requirements of the HAZWOPER regulation will be developed and approved prior to commencing field activities.

In addition to meeting the requirements of HAZWOPER, a HSP must also meet other project-specific requirements. An example would include U.S. Army Corps of Engineers Engineering Manual 385-1-1, “Safety and Health Requirements”.

The format for each HSP may differ based on the client requirements; however, all HSPs must meet the minimum requirements of the HAZWOPER standard. The NWI HSD or designee is responsible for approving all HSPs.

5. RECORDS

The Health and Safety Director will maintain the following *records* in accordance with QAP-171, “Records Control:”

- HSF-001.1, Task Hazard Analysis
- HSF-001.2, Job Safety Analysis
- Site-Specific HSP (assigned a document control number)

6. REFERENCES

[29 CFR 1920.120](#), Hazardous Waste Operations and Emergency Response

29 CFR 1926.65, Hazardous Waste Operations and Emergency Response

U.S. Army Corps of Engineers Engineering Manual 385-1-1, Safety and Health Requirements

APPENDIX A, Example of HSF-001.1, Task Hazard Analysis



TASK HAZARD ANALYSIS

NAME OF TASK:		
POTENTIAL HAZARDS (Existing hazards or those resulting from activities, Check all that apply)		
Potential Energy Sources	Physical Hazards	Environmental/Atmospheric Hazards
Energized Systems	Radiation (ionizing/nonionizing)	Confined Space(s)
Pressurized System	Heated Surfaces/Equipment	Oxygen Deficient Atmosphere
Overhead Hazards	Flying Debris/Projectiles	Explosive Atmosphere
High Vehicle Traffic	Pinch Points	Open Excavation/Trenches/Pits
Heavy Equipment	Physical Exertion	High Noise (>85 dBA)
Rotating Machinery	Lifting/Back strain	Heat Stress
Elevated Work (> 6 ft)	Slip/Tripping Hazards	Cold Stress
Cutting/Welding	Other:	Biological (snakes, ticks, plants)
Intrusive Activities	Other:	Chemically Contamination
Flammables/Combustibles	Other:	Radiologically Contamination
Other:	Other:	Other:
Comments/Notes:		
CONTROLS (Administrative, Engineering, PPE)		
Administrative (check all that apply)	Monitoring (check all that apply)	
Pre-job Safety Meetings	Total Volatile Compounds (VOCs)	
Specific Task Training (e.g., sampling)	Explosive atmosphere (LEL/UEL)	
Site Controls (e.g., zones)	Oxygen	
Decontamination (as required)	Wet Bulb Globe Temperature (WBGT)	
<i>Work Permits</i>	Total Dust (<10 uM)	
Safe Work	<i>Radiological</i>	
Construction	Radiation (mR/Hr)	
Hot Work (welding/cutting)	Contamination (cpm or dpm/100cm ²)	
Excavation	<i>Specific Contaminants</i>	
Lockout/Tagout		
Confined Space Entry		
Radiological (RWP)		
Comments/Notes:		

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APPENDIX B, Example of HSF-001.2, Job Safety Analysis



JOB SAFETY ANALYSIS

Job Name	Effective Date	JSA Number	Revision
Job Site	Expiration Date	Approved By	
		Project. Mgr.	
		SSO	
Job Description			
Required Training			
Required PPE			

SAMPLE

PPE Component Design Standards/Criteria:

- Eye and Face Protection: ANSI Z87.1-2003
- Foot Protection: ANSI Z41-1991
- Head Protection: ANSI Z89.1-1986
- Hand Protection: 29 CFR 1910.138

This JSA serves a written hazard assessment in accordance with 29 CFR 1910.132.

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NORTH WIND, INC.
ACCIDENT PREVENTION PLAN
ATTACHMENT 7
NWI HSP-11-002, HAZARD COMMUNICATION

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HSP-002

Hazard Communication

Revision 1

August 28, 2006

Approved:

Bruce Miller (See letter number 156)
Director, Health and Safety

08/21/06
Date

Sylvia Medina (See letter number 156)
President

08/21/06
Date

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DEFINITIONS

<i>Consumer Products</i>	Consumer products are defined as any product that can be purchased in a retail store and is available to the general public for personal or household use. Consumer products are exempt from hazard communication unless the product is used in a manner inconsistent with its intended use or in excessive quantities that create a physical or health hazard. For example, a can of cleanser used to clean the sink in an employee restroom would not be included in the hazard communication program; however, if the same cleanser is used in large quantities to clean process equipment, it should be addressed in the hazard communication program.
<i>Hazardous Chemicals</i>	Hazardous chemicals are defined as any chemical that offers a physical or health hazard. Chemicals presenting physical hazards include flammable and combustible liquids, compressed gases, explosives, organic peroxides, oxidizers, pyrophorics, unstable (reactive) chemicals, and water-reactive chemicals. Chemicals presenting health hazard include carcinogens, toxins, irritants, corrosives, sensitizers, reproductive toxins, and chemicals that have been shown through scientific evidence to cause adverse health effects to target organs such as the liver, kidneys, central nervous system, blood, lungs, skin, eyes or mucous membrane.
<i>Regulated Products</i>	All hazardous chemicals and any consumer product used in a manner inconsistent with its intended use or in excessive quantities that create a physical or health hazard. Products that are specifically exempt from hazard communication include hazardous waste; tobacco products; wood products; and food, drugs, and cosmetics intended for personal consumption or use.

ACRONYMS

CFR	Code of Federal Regulation
HSP	Health and Safety Plan
HSF	Health and Safety Form
MSDS	Material Safety Data Sheet
NWI	North Wind Inc.
OSHA	Occupation Safety and Health Administration
PM	Project Manager
QAP	Quality Assurance Procedure

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SS Site Supervisor

1. PURPOSE

This procedure represents the North Wind Inc. (NWI) written hazard communication program.

2. SCOPE

The NWI hazard communication program applies to all employees who are exposed to *regulated products* in offices, warehouses, laboratories, field projects, and any other location where this potential exists. This includes NWI full-time, part-time, and temporary duty employees, and employment agency and temporary employees hired and supervised by NWI.

The hazard communication program also applies to subcontractors and associates on field projects where NWI is responsible for project safety.

3. RESPONSIBILITIES

3.1 Employees and Subcontractor Personnel

- Reviews this procedure and complies with all requirements.

3.2 Health and Safety Director

- Maintains and updates the hazard communication program, and verifies compliance with the Occupational Health and Safety Administration (OSHA) 29 CFR 1910.1200 [Hazard Communication](#) standard.

3.3 Project Manager and Site Supervisor

- Ensures that a copy of this procedure is accessible to all field projects and that materials safety data sheets (MSDSs) are available for all regulated products at each project site.

4. PROCEDURE

OSHA requires that an employer's written Hazard Communication Program include specific topics. This procedure includes all the required elements, which are:

- A copy of the written program
- Procedures for container labeling
- Procedures for employee training

- Workplace monitoring of employee exposures
- Inventory list of the hazardous agents present in the workplace
- MSDSs for each *hazardous chemical* on the inventory list.

4.1 Covered Materials

Hazardous chemicals that will be included in the inventory and for which MSDSs shall be maintained are those materials included in any of the following:

- [29 CFR 1910, Subpart Z](#)
- Threshold Limit Values and biological exposure indices, American Conference of Governmental Industrial Hygienist, current edition
- Carcinogens identified by National Toxicology Program, International Agency for Research on Cancer, National Institute for Occupational Safety and Health, or 29 CFR 1910, Subpart Z
- Mixtures of chemical and radiological hazards (isotopes in a chemical solution) are covered by this program (if encountered).

Only hazardous chemicals used by NWI employees or subcontractors are included in this program. Other hazardous materials that might be present at the site include materials brought to the site by other contractors or subcontractors. These hazardous materials may include solids, liquids, compressed gases, raw materials to be welded, or other materials listed or identified as a hazardous chemical under the definition above. NWI employees working in areas where subcontractors are using or storing hazardous chemicals need to be informed of hazards and protective measures as outlined in the training section of this procedure.

4.1.1 Exemptions

Materials that are not subject to this program include:

- Hazardous waste
- Tobacco/tobacco products
- Wood/wood products
- Articles
- Retail food, drugs, cosmetics, alcoholic beverages packaged for sale to consumers

- Foods, drugs or cosmetics intended for personal consumption by employees at work
- Any *consumer product* being used at work in the same manner and quantities as normal consumer use (generally this exemption does not apply in an operations or maintenance function)
- Any drug in its solid, final form (pills or capsules)
- Ionizing radiation sources and hazards.

4.1.2 Carcinogens

Whenever possible, non-carcinogenic materials shall be used. Use of carcinogens by NWI employees requires the approval of the NWI Health and Safety Director and Project Manager (PM), or Site Supervisor (SS). As a minimum, [HSF-001.1, Task Hazards Analysis](#) (see Appendix A), includes designated carcinogen use areas, protective equipment, work practices and controls, will be developed and approved prior to carcinogen usage.

4.2 Hazardous Chemical Inventories

4.2.1 North Wind Inc. Operations

A NWI hazardous chemical inventory for each project site will be maintained at the site and includes all hazardous chemicals that NWI employees are potentially exposed to. The inventory will be developed based on chemicals located at the project site (i.e., chemicals present) and hazardous chemicals introduced by NWI employees or subcontractors. The inventory shall be updated to include new hazardous materials that are brought to the site and additional hazardous chemicals that are identified as site activities change. Copies of hazardous material inventories and MSDSs for materials in use at the project site will be maintained in the project field office by the PM or SS.

4.2.2 Subcontractors

Each contractor shall provide to the NWI PM or SS a copy of their hazardous chemical inventory and complete MSDSs, for all chemicals designated as a hazardous chemical prior to bringing hazardous chemicals to the project site. Copies of hazardous material inventories and MSDSs for materials in use at the project site will be maintained in the project field office by the PM or SS.

4.3 Material Safety Data Sheets

4.3.1 North Wind Inc.

The NWI PM or SS shall ensure that a current, complete MSDS is maintained at the project site or accessible on the NWI Intranet (<https://intranet.nwindenv.com/Corporate/HS/default.aspx>) for all hazardous chemicals included on the inventory list. Complete MSDSs contain all the information required by 29 CFR 1910.1200. The Checklist for Material Safety Data Sheet Completeness (see Appendix B) at the end of this procedure may be used in assessing the completeness of a MSDS.

4.3.2 Subcontractors

Subcontractors shall review the MSDSs for each hazardous chemical on their inventory to ensure all are current and complete. Copies of subcontractor MSDSs for materials in use at the project site will be provided to the NWI SS and maintained in the project field office.

4.3.3 Update and Correction of Material Safety Data Sheets

All subcontractors at the project site shall contact the supplier for chemicals that have an incomplete or outdated MSDS to obtain current and complete information. Updated MSDSs shall be supplied to the NWI SS upon receiving the information. Supplemental information for hazardous chemicals (in addition to the information required on MSDSs) may be provided by the NWI SS or health and safety representative, where additional information is requested or will enhance the safety of the employees.

4.4 Container Labels

All hazardous materials in use at project sites are required by OSHA to be labeled. The labels must contain the following information:

- Name of the material (must match that on the MSDS)
- Name and address of the material manufacturer, supplier, or distributor
- Appropriate hazard warnings, including target-organ information.

Any specialized labeling systems in use by subcontractors shall be explained in writing to the NWI PM or SS. A copy of the explanation shall also be forwarded to all other subcontractors at the site and included in site-specific training that is provided to employees.

4.4.1 Secondary Containers

When it is necessary to dispense hazardous chemicals from a properly labeled bulk container into a smaller secondary container, the secondary container shall be labeled with the same information as is required above. Corrosives or other liquids that will degrade the labels and make them unreadable shall be labeled with a tag, placard, label in a sheet protector, or other method that will protect the label from the effects of the material.

4.5 Exposure Monitoring and Hazard Assessment

NWI and all subcontractors shall ensure that air sampling is conducted, when appropriate, to monitor workplace levels of airborne contaminants for comparison with allowable exposure levels. Project hazard analysis will be conducted in accordance with [HSP-001, Project Hazard Analysis](#).

4.6 Training

4.6.1 General Training

All NWI employees whose work involves use of hazardous materials included in this program shall receive training prior to working with hazardous materials and at intervals as necessary to ensure employees have received the required training prior to working with any new materials. Training shall be provided and consist of the following:

- Explanation of the regulatory requirements for this procedure and where to obtain and review these regulations.
- Review of the contents of this procedure, its location(s), and availability.
- Review of the hazardous chemical inventory for the work area, including where specific chemicals are used and why they are hazardous. This shall include a review of the MSDS for each chemical and training on the health hazards and properties for each category (e.g., acids, flammable liquids, irritants, etc.) of chemicals that employees may be exposed to.
- Explanation of how to use an MSDS, and where the MSDSs for chemicals in their work area can be found.
- Explanation of any special labeling systems in use for identifying hazardous materials and communicating hazard information.
- Information about hazardous chemicals in use or being stored at the project site by other contractors, as appropriate.

- General emergency procedures to be followed in the event of a fire, spill, or other incident resulting in release of a hazardous chemical.

4.6.2 Site-Specific Training

NWI and subcontractor employees assigned to work at the project site shall receive site-specific hazard communication training consisting of a review of this procedure to ensure that employees are aware of the hazards posed by possible contaminants at the project site, and the mechanisms that will be used for information exchange between contractors. Additional job-specific training consisting of a review of the Hazard Communication Program shall be provided by subcontractors to supplement this training.

Office and administrative areas at the project site are exempt from the requirements for maintaining an inventory list and MSDSs, as these areas generally do not contain chemicals or other hazardous substances. Employees who work in office and administrative areas are required to receive training on this program and emergency procedures that apply to their work area. These employees will also receive site orientation training to inform them in general about the potential hazards at the project site.

4.6.3 Subcontractors

Subcontractors shall provide documented evidence that their employees have received the training required by the regulation for those hazardous materials that are being used. Proof of training shall be provided to the NWI SS prior to beginning work at the site.

Subcontractors using, storing, or handling hazardous materials shall ensure that other employees working in the same or adjacent areas are made aware of the hazardous materials in use, protective measures that must be taken to prevent overexposure, as well as any special procedures to follow in the event of a spill, release, or other emergency. This information shall be in writing, from one subcontractor to the other, and shall include a description of the activity, approximate dates that the activity will take place, and a list of hazardous material(s) and MSDSs for each that will be used.

The receiving contractor shall ensure that their employees review the information and shall maintain the MSDSs for the materials in a location that is easily accessible to employees until the activities involving the materials cease. The NWI SS shall receive a copy of all correspondence and documentation of training that is conducted to comply with these provisions.

4.7 Non-Routine Activities Involving Chemical Use

Employees who are asked to perform non-routine activities or any work activity that poses a special hazard, such as chemical use in a confined space, shall be informed as to the hazards involved and necessary precautions in accordance with the applicable program. In some cases a special work permit, procedure, or work control document will be required (i.e., HSF-001.1, Task Hazards Analysis). These will be addressed on a case-by-case basis.

5. RECORDS

The PM or SS will maintain the following record in accordance with [QAP-171, Records Control](#):

- HSF-001.1, Task Hazards Analysis.

6. REFERENCES

[29 CFR 1910, Subpart Z, Toxic and Hazardous Substances](#)

[29 CFR 1910.1200, Hazard Communication](#)

[HSP-001, Project Hazard Analysis](#)

QAP-171, Records Control

APPENDIX A, Example of HSF-001.1, Task Hazards Analysis



TASK HAZARD ANALYSIS

NAME OF TASK:		
POTENTIAL HAZARDS (Existing hazards or those resulting from activities, Check all that apply)		
Potential Energy Sources	Physical Hazards	Environmental/Atmospheric Hazards
Energized Systems	Radiation (ionizing/nonionizing)	Confined Space(s)
Pressurized System	Heated Surfaces/Equipment	Oxygen Deficient Atmosphere
Overhead Hazards	Flying Debris/Projectiles	Explosive Atmosphere
High Vehicle Traffic	Pinch Points	Open Excavation/Trenches/Pits
Heavy Equipment	Physical Exertion	High Noise (>85 dBA)
Rotating Machinery	Lifting/Back strain	Heat Stress
Elevated Work (> 6 ft)	Slip/Tripping Hazards	Cold Stress
Cutting/Welding	Other:	Biological (snakes, ticks, plants)
Intrusive Activities	Other:	Chemically Contamination
Flammables/Combustibles	Other:	Radiologically Contamination
Other:	Other:	Other:
Comments/Notes:		
CONTROLS (Administrative, Engineering, PPE)		
Administrative (check all that apply)	Monitoring (check all that apply)	
Pre-job Safety Meetings	Total Volatile Compounds (VOCs)	
Specific Task Training (e.g., sampling)	Explosive atmosphere (LEL/UEL)	
Site Controls (e.g., zones)	Oxygen	
Decontamination (as required)	Wet Bulb Globe Temperature (WBGT)	
Work Permits	Total Dust (<10 uM)	
Safe Work	Radiological	
Construction	Radiation (mR/Hr)	
Hot Work (welding/cutting)	Contamination (cpm or dpm/100cm ²)	
Excavation	Specific Contaminants	
Lockout/Tagout		
Confined Space Entry		
Radiological (RWP)		
Comments/Notes:		

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APPENDIX B, Checklist for Material Safety Data Sheet Completeness

Each MSDS must contain the following information:

- Name of the material (same as on the label).
- Chemical and common name(s) of ingredients that are identified by 29 CFR 1910.1200, Hazard Communication, as hazardous chemicals that are present in the material.
- Physical and chemical characteristics of the chemical, such as flash point, vapor pressure, boiling point, etc.
- Physical hazards posed by the material (e.g., fire, explosion).
- Health hazards including signs and symptoms of overexposure and any medical conditions that are aggravated by exposure to the chemical.
- Primary route of exposure.
- American Conference of Government Industrial Hygienist Threshold Limit Values and the OSHA Personal Exposure Limit, and any other exposure limit used by the manufacturer or preparer of the MSDS.
- Whether the material is listed in the National Toxicology Program annual report on carcinogens, or has been found to be a potential carcinogen in the International Agency for Research on Cancer Monographs, or by OSHA.
- Generally applicable precautions for safe handling and use, including hygienic practices.
- Instructions for clean-up of spills and leaks.
- Recommended control measures including engineering controls, personal protective equipment, and work practices.
- Emergency first aid procedures.
- Date of preparation of the MSDS and any changes to it.

- Name, address, and telephone number of the manufacturer or other responsible party preparing or distributing the MSDS who can provide additional information on the material and appropriate emergency procedures, if necessary.

NOTE: *If any section of the MSDS is blank for any of the above categories, OSHA requires that the section must be marked to indicate that no applicable information was found.*

NORTH WIND, INC.
ACCIDENT PREVENTION PLAN
ATTACHMENT 8
NWI HSP-11-003, PERSONAL PROTECTIVE EQUIPMENT

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HSP-003

Personal Protective Equipment

Revision 1

August 28, 2006

Approved:

Bruce Miller (See letter number 156)
Director, Health and Safety

08/21/06
Date

Sylvia Medina (See letter number 156)
President

08/21/06
Date

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DEFINITIONS

None

ACRONYMS

ALARA	As-Low-As-Reasonably-Achievable
ANSI	American National Standards Institute
HSD	Health and Safety Director
HSP	Health and Safety Plan
HSF	Health and Safety Form
in.	inch
NWI	North Wind Inc.
MSDS	Material Safety Data Sheet
OSHA	Occupation Safety and Health Administration
PAPR	Powered Air Purifying
PPE	Personal Protective Equipment
SCBA	Self-Contained Breathing Apparatus
SS	Site Supervisor
SSO	Site Safety Officer

1. PURPOSE

North Wind Inc. (NWI) is committed to providing a safe working environment for its employees. When actual or potential hazards exist and engineering controls or safe work practices cannot eliminate the hazard, employees shall use personal protective equipment (PPE). This procedure covers eye and face, head, foot, hand, and body protective equipment. Respiratory, hearing, and fall protective equipment are covered in procedures [HSP-007, Respiratory Protection](#), [HSP-008, Hearing Conservation](#), and [HSP-014, Fall Protection](#).

2. SCOPE

This procedure applies to all NWI controlled field and laboratory projects and all personnel (NWI and subcontractors) participating in projects where PPE is required.

3. RESPONSIBILITIES

3.1 Health and Safety Director

- Maintains the NWI PPE procedures
- Determines, with assistance from the Site Supervisor (SS) and Site Safety Officer (SSO), that all feasible engineering controls and safe work practices have been considered before requiring employees to wear PPE
- Assists the SS or SSO in resolving deficiencies noted during PPE procedure self-assessments
- Consults with SSO users to obtain their views of program effectiveness during Health and Safety Director (HSD) audits
- Incorporates lessons learned and improvements into this procedure.

3.2 Personal Protective Equipment Users

- Completes the appropriate training in the proper use of PPE.
- Acquires necessary reusable, disposable, and project-specific PPE from the SS or SSO.
- Uses PPE as required in the project-specific hazard analysis documentation.
- Inspects PPE prior to use and maintains it in a clean and safe condition.
- Does not modify, tamper with, or repair PPE beyond routine maintenance.

- Informs the SS or SSO of equipment that is damaged.
- Informs the SS, SSO, or HSD of equipment that they believe does not adequately protect them from actual or potential hazards.

3.3 Site Safety Officer

- Designates PPE use areas through adequate delineation and posting and certifies that a hazards assessment has been performed in accordance with [HSP-001, Project Hazards Analysis](#).
- Assists the SS in analyzing and evaluating work areas to identify hazards and sources of hazards to workers and completing the appropriate HSP-001, Project Hazards Analysis documentation.
- Selects PPE in accordance with HSP-001, Project Hazards Analysis, the latest OSHA or American National Standards Institute (ANSI) standards, and site-specific hazards.
- Evaluates and approves PPE not in the current inventory for use on project sites and for operations.
- Ensures all appropriate required medical surveillance associated with individual PPE has been completed in accordance with [HSP-006, Medical Surveillance](#).
- Contacts the NWI HSD with questions regarding PPE usage, upgrading, downgrading, chemical compatibility, and limitations when questions arise.

3.4 Site Supervisor

- Ensures all project tasks have been evaluated in accordance with [HSP-001, Project Hazards Analysis](#). This hazard analysis meets the requirements of Occupational Safety and Health Administration's (OSHA's) [29 CFR 1910.132\(d\)](#), Hazard Assessment.
- Ensures project personnel are trained to use PPE in accordance with Section 4.1 of this procedure.
- Ensures project personnel wear required PPE at the project site and enforces site requirements for subcontractors and visitors.
- Posts warning signs or otherwise identifies areas, equipment, tools, and jobs that require the use of PPE.
- Contacts the NWI SSO or HSD with questions related to PPE usage and limitations.

4. PROCEDURE

It is the policy of NWI to provide and require the use of PPE to protect against actual or potential hazards that cannot be eliminated through engineering controls, safe work practices, or other means. PPE requirements for specific jobs will be included in project hazard analysis documents (such as project-specific Task Hazard Analysis, Job Safety Analysis, or Health and Safety Plan [HSP]) and entrances to controlled areas will be posted with PPE requirements.

4.1 Acquiring Personal Protective Equipment

Reusable PPE may be funded by the project, regional cost center or through corporate, while disposable and project-specific PPE is funded by the project. Regardless of the funding source, employees should not have difficulty in getting the PPE they need to safely do their work. The SS or SSO should be contacted if problems are encountered in getting the necessary equipment.

Project sites will be stocked with items of PPE, including gloves, face shields, respirators, safety glasses, hard hats, and hearing protection, etc. New safety equipment will be approved by the SSO in conjunction with the HSD (as required) before procurement. When required PPE is not readily available, the affected employee(s) will immediately notify the SS. Employees will not begin work that requires PPE if such equipment is not available. PPE that is furnished by the employee must be approved by the SSO before it can be used while performing work at NWI job sites.

4.2 Inspecting, Using, and Maintaining Personal Protective Equipment

Users of PPE shall inspect the equipment prior to use and after any occurrence that could effect the equipment's integrity. Damaged PPE shall be discarded and not used. Users shall not modify, tamper with, or repair PPE beyond routine maintenance. Any contaminated item that may contact the skin of the wearer will be disinfected before being reissued.

4.3 Training

OSHA requires each PPE user to receive training on the proper care, maintenance, limitations, and instructions on how to wear and adjust PPE. Personnel working on hazardous waste projects are required to complete the 40-hour Hazardous Waste Operations Training that includes a module on PPE that meets the OSHA requirements. Personnel working on non-hazardous waste projects are required to complete the NWI computer-based [PPE training module](#).

The proper use of PPE shall also be included in project safety briefings and toolbox meetings.

4.4 Types of Personal Protective Equipment

4.4.1 Eye and Face Protection

Eye and face protection requirements are outlined in OSHA Standard [29 CFR 1910.133](#), Eye and Face Protection. Eye and face protection must meet ANSI Z87.1-2003, Occupational and Educational Eye and Face Protective Devices, criteria. Eye and face protection is generally required for protection from flying particles, molten metal, liquid chemicals, acids or caustic liquids, chemical gases or vapors, or potentially injurious light radiation.

Eye and face protection should be comfortable and clean. They should be positioned so as to give the widest possible field of vision. Eye and face protection includes safety glasses; prescription safety glasses with side shields and respirator glass inserts; goggles; face shields; and welding goggles or helmets.

4.4.1.1 Safety Glasses

Safety glasses are the basic form of eye protection and are required where general eye hazards are present. Only safety glasses having an ANSI Z87.1 label shall be used. Tinted or shaded safety glasses may be used for protection from glare when working in bright environments.

NOTE: *ANSI has approved ANSI Z87.1-2003, Occupational and Educational Eye and Face Protective Devices standard. There are several changes and minor alterations to the old standard. Eye protectors are now classified as either **basic** or **high impact**. High impact removable lenses require the manufacturer's mark or logo and a "+". For more information on the new standard contact the NWI HSD.*

4.4.1.2 Prescription Safety Glasses

Safety glasses or goggles can be worn over prescription glasses to provide adequate eye protection, but are not as comfortable as prescription safety glasses. Most optometrists have standard safety glass frames in stock from which employees can choose. Side shields are required for prescription safety glasses.

Prescription glass inserts may be used for full-face respirators. The regional equipment specialist supplies the correct spectacle kit, while an optometrist supplies the appropriate lenses.

4.4.1.3 Goggles

Goggles are recommended when conducting activities that generate flying particles or when handling chemicals so as to protect from splashes and vapors.

4.4.1.4 Face Shields

Face shields, in combination with safety glasses, shall be used when the potential for exposure to the following occurs: chemical splashes, acid or caustic handling, extreme heat, or flying particles or sparks.

Care should be taken when flipping up a face shield, because material that has accumulated on the lenses may fall onto the face and into the eyes. Use cleaning and defogging solutions often to keep lenses clean and free from fogging. Vision through dirty or fogged lenses can cause eye fatigue and may result in an accident. Scratched or pitted lenses can also reduce visibility and must be replaced.

Unless used to protect against welding flash, tinted-lens safety glasses should not be worn inside buildings. Contact lenses are not considered protective devices and shall not be worn when chemical exposure can cause reactions with these lenses. All eye protection must provide side protection. Detachable side shields meeting ANSI Z87.1 requirements are acceptable. Never use face shields without wearing safety glasses or goggles underneath the shield.

4.4.1.5 Welding Goggles or Helmets

Welder's eyes are subject to damage from radiant energies, as well as hot metal fragments chips, etc. The filtering properties of filter lenses have been established by the National Bureau of Standards. The percent transmission of radiant energies is established in 16 different filter lens shades. Welders are required to use filters meeting the requirements of [29 CFR 1926.102](#), Table E-2, Filter Lens Shade Numbers for Protection Radiant Energy, as applicable. Further guidance is outlined in Table 1.

Table 1. Welding filter shade selection guide

Welding Operation	Shade Number
Shielded metal-arc welding 1/16-, 3/32-, 1/8-, 5/32-in. diameter electrodes	10
Gas-shielded arc welding (nonferrous) 1/16-, 3/32-, 1/8-, 5/32-in. diameter electrodes	11
Gas-shielded arc welding (ferrous) 1/16-, 3/32-, 1/8-, 5/32-in. diameter electrodes	12
Shielded metal-arc welding 3/16-, 7/32-, 1/4-in. diameter electrodes	12
5/16-, 3/8-in. diameter electrodes	14
Atomic hydrogen welding	10–14
Carbon-arc welding	14
Soldering	2

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Welding Operation	Shade Number
Torch brazing	3 or 4
Light cutting, up to 1 in.	3 or 4
Heavy cutting, 1–6 in.	5 or 6
Gas welding (light), up to 1/8-in.	4 or 5
Gas Welding (medium), 1/8–1/2-in.	5 or 6
Gas welding (heavy), over 1/2-in.	6 or 8

4.5 Head Protection

Head protection requirements are outlined in OSHA Standard [29 CFR 1910.135](#), Head Protection. Head protection is generally required for protection from impact and penetration hazards caused by falling objects, and when exposed to electrical hazards. NWI’s policy is to require hard hats where overhead hazards are present, and when working at project field sites in designated hard hat areas. This requirement may not be in effect when working in offices, control rooms, or other similar areas, unless an overhead hazard is also present or unless these areas are also designated as a hard hat area.

Three classifications of hard hats exist: (1) Class A, (2) Class B, and (3) Class C. All classes provide protection from impact and penetration; however, only Class A and B hard hats also provide protection from electrical hazards.

Hard hats shall be worn with the bill of the helmet facing forward. Hard hats shall be equipped with properly attached suspensions that are designed to absorb the force of an impact. This suspension must be kept a minimum of 1-1/4 in. below the inside of the hard hat. In order to ensure that adequate clearance is maintained, never carry objects inside the hard hat.

Before each use, always inspect the hard hat for cracks, signs of impact or rough treatment, and wear that might reduce its structural integrity. Hard hats that show signs of damage should not be used and must be discarded. Suspensions should be inspected for loose or torn cradle straps, broken sewing lines, loose rivets, and other defects. Suspensions should be replaced if damage is found.

Prolonged exposure to ultraviolet rays (sunlight) and heat can damage thermoplastic helmets, so these helmets should not be stored on the rear window shelf of vehicles. Removal of tar, paint, and other materials may require the use of solvents, but some solvents can damage a plastic helmet’s shell, so follow the specific manufacturer’s recommendations when cleaning. Before painting or applying adhesives (such as stickers

or decals) to hard hats, consult the manufacturer to ensure that the material will not reduce the dielectric properties or attack and soften the shell material.

Hard hats shall meet ANSI Z89.1-2003, Industrial Head Protection, criteria. Class A hard hats have limited voltage resistance and should be used for general service, while Class B hats are designed for high-voltage protection. Class C hard hats are typically made from conductive aluminum that should never be used around electrical hazards. No specifications exist that cover bump caps so they should only be used for bumping hazards.

4.6 Foot Protection

Foot protection requirements are outlined in OSHA Standard [29 CFR 1910.136](#), Occupational Foot Protection. Foot protection is generally required for protection from falling or rolling objects, objects that could pierce the sole of the foot, and for protection from electrical or chemical hazards. Standard safety-toed boots or sturdy leather boots above the ankle (construction hazards only) are required where foot hazards are present.

Toe reinforcement and sole shanks of protective footwear are often made of steel, but Kevlar is better for cold environments since it is a better thermal insulator than steel. Metal-free shoes or boots are also required when working around exposed electrical equipment.

Specific boot or shoe covers may be required if working around hazardous chemicals (consult the applicable Material Safety Data Sheets [MSDS] for the proper type recommended). Avoid leather shoes or boots when working around chemicals. Instead, rubber or synthetic footwear or protective over boots should be used.

Foot protection must meet compression and impact resistance requirements of ANSI Z41.1. Approved foot wear carries an ANSI Z41.1 label attached to the inside of the shoe or boot.

4.7 Hand Protection

Hand protection requirements are outlined in OSHA Standard [29 CFR 1910.138](#), Hand Protection. Gloves are generally required for protection from severe cuts or abrasions, punctures, skin absorption of harmful substances, chemical burns, thermal burns, and harmful temperature extremes.

A wide variety of gloves exist for almost every condition; however, no one glove is good for all situations. When working with chemicals, consult the MSDS for the recommended type of hand protection. Vinyl or neoprene gloves suffice when working with most dilute chemicals. Leak-proof synthetic gloves are necessary when working with petroleum-based materials. Leather gloves protect against sparks, rough surfaces, and

scraping objects. Metal mesh gloves protect hands from knives, blades, and other sharp objects. Electrically insulated gloves offer protection from electrical shock and burns.

Only properly sized gloves should be worn. Gloves that are too small can fatigue the hands, while gloves that are too large can be clumsy and could get caught in moving machinery, which could pull the hand into the equipment. When working with chemicals, gloves should be taped at the top or folded with a cuff to prevent liquids from running inside the glove.

Before each use, inspect gloves for rips, abrasions, holes, and other deformities. Defective gloves should not be used and must be discarded. Some gloves may be laundered to remove contaminants and prolong their useful life. Always follow manufacturer's guidelines.

Proper selection of hand protection will depend on the hazard to be manipulated, its concentration, and the exposure duration. If the project hazard analysis documentation does not identify the specific type of gloves for a particular chemical or hazard, contact the SSO or NWI HSD for guidance. Consult the glove manufacturer's guidelines to determine the limitations for each situation.

4.8 Body Protection

Body protection includes chemical-protective clothing, flotation gear, fire-resistant coveralls, physical protection, and cooling garments.

Chemical-protective clothing may be fully encapsulating or non-encapsulating. Some fully encapsulated suits are vapor tight. Aprons, leggings, and sleeve protectors are also available. The Environmental Protection Agency system for classifying protective clothing is called "the level of protection". Originally designed for hazardous waste work, this system is now broadly applied to general work environments. Basic Levels of PPE (see Appendix A) lists the typical equipment for each level of protection.

Flotation gear is used to add buoyancy to personnel working around water. If hazardous chemicals are present, the flotation device should be protected from exposure to materials that could damage it.

Fire resistant materials include Nomex, PBI[®], and brominated cotton. If there is a risk of fire or extremely high temperature, then synthetic fibers that melt with high heat must not be worn.

Cooling garments remove excess heat generated by worker activity, equipment, or the environment. Some cooling devices circulate cool dry air throughout the garment while others circulate cool water or a high-heat-capacity gel through tubes to remove excess heat. Also available are vests with pockets for inserting packets of ice.

4.9 Radiological Protection

Employees who work with radiation require special PPE and must have specialized training and follow specific procedures to assure their exposures radiation sources and radiological contamination follow As-Low-As-Reasonably-Achievable (ALARA) principles. Specific radiological PPE requirements will be determined on a project-by-project basis in accordance with the project hazard analysis documentation, radiological work permits, and based on project ALARA reviews for the use of shielding.

5. RECORDS

The Health and Safety Director shall maintain the following records in accordance with QAP-171, Records Control:

- None

6. REFERENCES

29 CFR 1910.132, Personal Protective Equipment

29 CFR 1910.133, Eye and Face Protection

29 CFR 1910.135, Head Protection

29 CFR 1910.136, Occupational Foot Protection

29 CFR 1910.138, Hand Protection

29 CFR 1926, Safety and Health Regulations for Construction

ANSI Z41.1-1991, American National Standard for Personal Protection-Protective Footwear

ANSI Z87.1-2003, Occupational and Educational Personal Eye and Face Protective Devices

ANSI Z89.1, Industrial Head Protection

HSP-001, Project Hazards Analysis

HSP-006, Medical Surveillance

HSP-007, Respiratory Protection

HSP-008, Hearing Conservation

HSP-014, Fall Protection

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APPENDIX A, Basic Levels of Personal Protective Equipment

The following table provides the basic levels of PPE generally used for hazardous waste operations and emergency response actions. Modification to each PPE Level are allowed, as long as the minimum protective clothing and respiratory protection are not compromised. The project-specific hazard analysis in conjunction with applicable work permits will define the appropriate level of PPE for each project activity.

PPE Level	Minimum PPE Required	Comments
D	<ul style="list-style-type: none"> • Normal work clothing • Hard hat (head protection) • Safety-toed boots (foot protection) • Gloves (hand protection) • Safety glasses (eye protection) 	Additional safety equipment such as high visibility reflective vests, face shield, chemical resistant coveralls and booties, and hearing protection may also be required based on the project-specific hazards.
C	<p><u>Level D PPE with the addition of:</u></p> <ul style="list-style-type: none"> • Air-purifying respirator (half-face, full-face, or powered air-purifying [PAPR]) equipped with the appropriate chemical and/or particulate cartridge • Chemical resistant protective clothing 	<p>Respiratory protection selection is based on the required protection factor and contaminant(s) of concern.</p> <p>Protective clothing materials selection is based on the contaminant(s) of concern.</p>
B	<p><u>Level C PPE with the following respiratory protection:</u></p> <ul style="list-style-type: none"> • Air-supplied respiratory protection 	Air-supplied respiratory protection may be 1) air-line with and escape cartridge or air-supply bottle or 2) a self-contained breathing apparatus
A	<ul style="list-style-type: none"> • Chemical-resistant encapsulating suit • Self-contained breathing apparatus (SCBA) • Chemically-resistant gloves and boots 	Protective clothing materials selection is based on the contaminant(s) of concern.

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NORTH WIND, INC.
ACCIDENT PREVENTION PLAN
ATTACHMENT 9
NWI HSP-11-005, ACCIDENT AND INCIDENT REPORTING

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HSP-005

Accident Reporting and Investigation

Revision 1

August 28, 2006

Approved:

Bruce Miller (See letter number 156)
Director, Health and Safety

08/21/06
Date

Sylvia Medina (See letter number 156)
President

08/21/06
Date

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DEFINITIONS

None

ACRONYMS

CFR	Code of Federal Regulations
HSD	Health and Safety Director
HSP	Health and Safety Plan
HSF	Health and Safety Form
NWI	North Wind Inc.
OSHA	Occupation Safety and Health Administration
SS	Site Supervisor
SSO	Site Safety Officer

1. PURPOSE

The purpose of this accident and injury reporting program is to ensure all injuries, illnesses, and workplace incidents are reported and documented in a standardized manner and recorded in accordance with Occupational Safety and Health Administration (OSHA) requirements. The primary purpose of accident investigation is to determine the causes to prevent further similar occurrences. The secondary purpose is to allow evaluation of other system elements to preclude like occurrences.

2. SCOPE

This North Wind Inc. (NWI) injury and illness reporting program applies to all NWI personnel, subcontractors, and visitors who sustain a work-related injury or illness at a NWI controlled project area. This Program provides specific guidelines for accessing, completing, updating, and reviewing the [HSF-005.1, Incident Report Form](#) (see Appendix A).

3. RESPONSIBILITIES

3.1 Human Resources Director

- Notifies NWI's insurance carrier of the accident and provides claim data (e.g., information on the accident, injury status, and medical provider, and any other pertinent information). The reporting service will provide a confirmation case number; fax a report to the insurance carrier on the same day the accident is reported, and mail a copy of the report to NWI and the insurance carrier. Additional notifications may also be required to the Industrial Commission of the State in which NWI is operating. In addition, Human Resources Director:
- Determines, in consultation with the NWI Health and Safety Director (HSD), if the accident is recordable in accordance with [29 CFR 1904](#), Subpart C, Recordkeeping Forms and Recording Criteria. If the accident is considered to be OSHA recordable, the injury/illness will be entered on the OSHA 300 Form, Log of Work-Related Injuries and Illnesses, within six (6) days of this determination, as applicable.
- Maintains a complete file of the accident information and provides copies of reports for inclusion into the employee's medical file.
- Requests the Site Supervisor (SS) escort the person(s) involved in the incident to submit to a post-incident drug and alcohol substance screening test where deemed appropriate (based on direction from the HSD).

3.2 North Wind Inc. Health and Safety Director

- Assists in the investigation of each accident and when requested by the NWI President, leads the investigation following the initial notification based on the significance of the event
- Reviews all HSF-005.1, Incident Report Form and determine immediate cause.
- Determines the root-cause and contributing factors of the incident based on the investigation and additional analysis.
- Takes corrective actions where deemed appropriate to eliminate the hazards, modify equipment, procedures, project safety analysis documentation, and work practices, conduct training/retraining, and develop a lesson learned incident report.
- Provides a summary of the investigation, root-cause, contributing factors and recommended corrective actions to NWI Senior Management.
- Distributes the lessons learned incident report.

3.3 Project Manager

- Ensures any corrective actions related to the incident are implemented.
- Provides the lessons learned to the SS and project personnel.
- Interfaces with the client and/or subcontractor to collect and submit required information following the incident.

3.4 Site Supervisor

- Ensures immediate medical care is arranged.
- Follows the initial medical or emergency response actions, the SS with support of witnesses and the Site Safety Officer (SSO) (if assigned) will complete HSF-005.1, Incident Report Form and makes required NWI notifications as described below.
- Notifies Human Resources Director (208) 528-8718 and Project Manager of the event including giving the location and nature of the accident, a quick verbal status of the injury/illness, and verbal assessment of the causes of the incident.

4. PROCEDURE

4.1 Responding to On-Site Incidents

Once notified of the incident, the SS will perform the following:

- Gather basic information about the incident including but not limited to:
 - Nature (e.g., injury, fire, spill, etc) and exact location of the incident
 - Individuals injured or having symptoms
 - What actions have been taken
 - What emergency resources are required in order to respond.
- Request emergency response resources (e.g., fire, ambulance, police, etc) based on the nature of the incident.
- Make required client and NWI notifications.
- Obtain a copy of HSF-005.1, Incident Report Form and complete the form.
- Ensure the individual(s) involved in the incident submit a urine sample to the identified laboratory as part of the post-incident investigation where deemed appropriate by the NWI HSD and Human Resources.

4.2 Completing HSF-003, Incident Report Form

NOTE: *It is critical to accurately record the facts surrounding any incident at the project site. As soon as practical a copy of HSF-005.1, Incident Report Form will be completed by the SS. Where an injury or accident (e.g., automobile, equipment, or similar) has occurred, the scene of the incident should be secured to protect evidence until properly investigated.*

The SS, with participation from the SSO (if assigned) and other witnesses of the incident, shall gather information necessary to complete HSF-005.1 Incident Report Form. The Fact Finding Flow Chart provided in Appendix B can be utilized to gather and document facts and information related to the incident.

HSF-005.1, Incident Report Form shall be completed and submitted to Human Resources **within four (4) hours** if one of the following circumstances occurs:

- The injury or illness results in death, lost time beyond the day of injury, days of restricted work activity, or medical treatment beyond First Aid.

- The nature of the accident indicates that a recurrence could result in further, repeated, or more serious injuries or damage.
- A spill or environmental release to the environment of any hazardous substance above the reportable quantity.
- Property damage occurs and reporting is required by terms of the contract.
- A “near miss” incident occurs that could have resulted in one of the aforementioned occurrences.

HSF-005.1, Incident Report Form will be completed and faxed to Human Resources Director within eight (8) hours for all other incidents.

Results from this investigation will be reported to all site personnel at the next pre-job meeting following final determination of the incident and will be used as a “lessons learned” event and to prevent future occurrences.

5. RECORDS

The H&SD along with the Human Resource Director will maintain the following records in accordance with QAP-10-171, Records Control.

- HSF-005.1, Incident Report Form.
- OSHA 300 Form = Human Resources Director

6. REFERENCES

29 CFR 1904, Subpart C, Recordkeeping Forms and Recording Criteria

QAP-10-171, Records Control

APPENDIX A, Example f HSF-005.1, Incident Report Form



Incident Report Form

Injured Employee Information Section

Employee Name: _____ Employee Number: _____
 Project Name: _____ Project Number: _____
 Job Assignment: _____ Business Group: _____
 Preparer's Name: _____ Preparer's Employee Number: _____

Injury Specific Information Section

Date of Injury: _____ Time of Injury: _____ A.M./P.M.

Injury Type

- | | | | | |
|--|---|--|--|---|
| <input type="checkbox"/> Amputation | <input type="checkbox"/> Cancer | <input type="checkbox"/> Dislocation | <input type="checkbox"/> Hearing Loss | <input type="checkbox"/> Poisoning (Systemic) |
| <input type="checkbox"/> Asphyxia | <input type="checkbox"/> Carpal Tunnel | <input type="checkbox"/> Electric Shock | <input type="checkbox"/> Heat Exhaustion | <input type="checkbox"/> Puncture |
| <input type="checkbox"/> Bruise/Contusion/Abrasion | <input type="checkbox"/> Concussion | <input type="checkbox"/> Foreign Body in Eye | <input type="checkbox"/> Hemia | <input type="checkbox"/> Radiation Effects |
| <input type="checkbox"/> Burn (Chemical) | <input type="checkbox"/> Cut/Laceration | <input type="checkbox"/> Fracture | <input type="checkbox"/> Other (Specify) _____ | <input type="checkbox"/> Strain/Sprain |
| <input type="checkbox"/> Burn/Scald (Heat) | <input type="checkbox"/> Dermatitis | <input type="checkbox"/> Freezing/Frost Bite | | |

Injured Body Part

- | | | | | |
|--------------------------------------|--|--|--|---------------------------------------|
| <input type="checkbox"/> Abdomen | <input type="checkbox"/> Elbow(s) | <input type="checkbox"/> Hip(s) | <input type="checkbox"/> Lung | <input type="checkbox"/> Shoulder(s) |
| <input type="checkbox"/> Arm(s) | <input type="checkbox"/> Eye(s) | <input checked="" type="checkbox"/> Kidney | <input type="checkbox"/> Multiple | <input type="checkbox"/> Upper Arm(s) |
| <input type="checkbox"/> Back | <input type="checkbox"/> Face | <input type="checkbox"/> Knee(s) | <input type="checkbox"/> Neck | <input type="checkbox"/> Upper Leg(s) |
| <input type="checkbox"/> Blood | <input type="checkbox"/> Finger(s) | <input type="checkbox"/> Leg(s) | <input type="checkbox"/> Nervous System | <input type="checkbox"/> Wrist(s) |
| <input type="checkbox"/> Body System | <input type="checkbox"/> Foot/Feet/Toe(s)/Ankle(s) | <input type="checkbox"/> Liver | <input type="checkbox"/> Other (Specify) _____ | |
| <input type="checkbox"/> Chest | <input type="checkbox"/> Hand(s) | <input type="checkbox"/> Lower Arm(s) | | |
| <input type="checkbox"/> Ear(s) | <input type="checkbox"/> Head | <input type="checkbox"/> Lower Leg(s) | <input type="checkbox"/> Reproductive System | |

How did the injury occur? _____

Type of Activity

- | | | |
|--|--|--|
| <input type="checkbox"/> Asbestos Work | <input type="checkbox"/> Excavation Trench – Haz Waste | <input type="checkbox"/> Other (Specify) _____ |
| <input type="checkbox"/> Confined Space Entry | <input type="checkbox"/> Excavation Trench – Non-Haz Waste | |
| <input type="checkbox"/> Construction Management – Haz Waste | <input type="checkbox"/> Facility Walk Through | <input type="checkbox"/> Process Safety Management |
| <input type="checkbox"/> Construction Management – Non-Haz Waste | <input type="checkbox"/> General Office Work | <input type="checkbox"/> Tunneling |
| <input type="checkbox"/> Demolition | <input type="checkbox"/> Keyboard Work | <input type="checkbox"/> Welding |
| <input type="checkbox"/> Drilling – Haz Waste | <input type="checkbox"/> Laboratory | <input type="checkbox"/> Wetlands Survey |
| <input type="checkbox"/> Drilling – Non-Haz Waste | <input type="checkbox"/> Lead Abatement | <input type="checkbox"/> Working from Heights |
| <input type="checkbox"/> Drum Handling | <input type="checkbox"/> Motor Vehicle Operation | <input type="checkbox"/> Working in Roadways |
| <input type="checkbox"/> Electrical Work | <input type="checkbox"/> Moving Heavy Object | <input type="checkbox"/> WWTP Operation |

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Incident Report Form

Nature of Injury

- | | | |
|---|--|---|
| <input type="checkbox"/> Absorption | <input type="checkbox"/> Ingestion | <input type="checkbox"/> Repeated Motion/Pressure |
| <input type="checkbox"/> Bite/Sting/Scratch | <input type="checkbox"/> Inhalation | <input type="checkbox"/> Rubbed/Abraded |
| <input type="checkbox"/> Cardio-Vascular/Respiratory System Failure | <input type="checkbox"/> Lifting | <input type="checkbox"/> Shock |
| <input type="checkbox"/> Caught In or Between | <input type="checkbox"/> Other (Specify) _____ | <input type="checkbox"/> Struck Against |
| <input type="checkbox"/> Fall (From Elevation) | <input type="checkbox"/> Overexertion | <input type="checkbox"/> Stuck By |
| <input type="checkbox"/> Fall (Same Level) | | |

Where did the injury occur?

- Company Premises Field In Transit Other (Specify) _____

Address where the injury occurred: _____

Equipment Malfunction: Yes No Activity was a Routine Task: Yes No

Describe any property damage.

Describe how you may have prevented this accident.

Medical Treatment Information Section

Initial Diagnosis/Treatment Date: _____

Physician Information

Hospital Information

Name _____
Address _____
City _____
State _____ Zip Code _____
Phone () _____

Name _____
Address _____
City _____
State _____ Zip Code _____
Phone () _____

Emergency Room Information

Name _____
Address _____
City _____
State _____ Zip Code _____
Phone () _____



Incident Report Form

Witness Information (First Witness)

Name _____
Employee Number _____
Address _____
City _____
State _____ Zip Code _____
Phone () _____

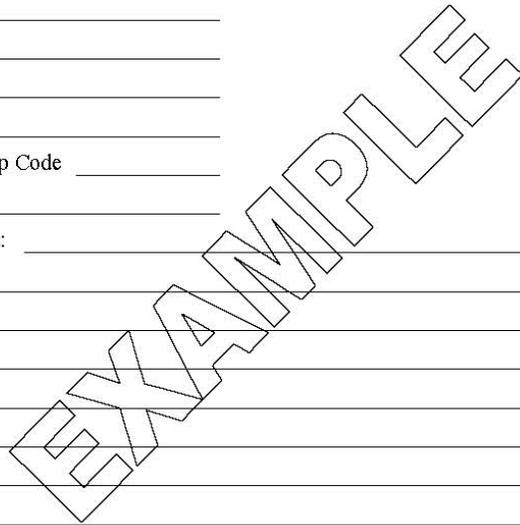
Witness Information (Second Witness)

Name _____
Employee Number _____
Address _____
City _____
State _____ Zip Code _____
Phone () _____

Witness Information (Third Witness)

Name _____
Employee Number _____
Address _____
City _____
State _____ Zip Code _____
Phone () _____

Additional information or comments: _____



Please do not write on this page.

OSHA Information Section *(This section to be completed by North Wind, Inc. Health and Safety Officer)*

Type of Treatment

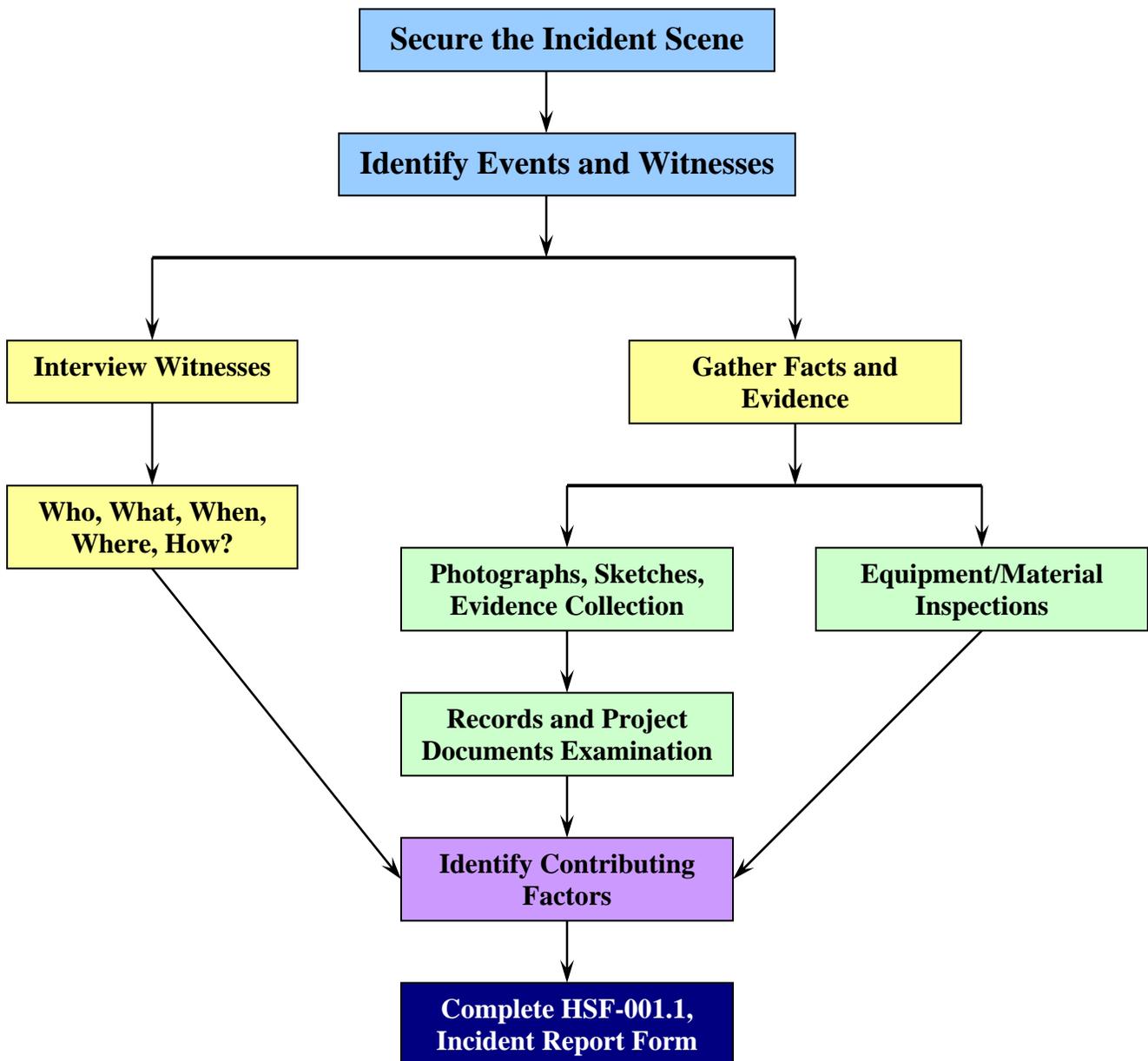
- | | |
|---|---|
| <input type="checkbox"/> Admission to Hospital/Medical Facility | <input type="checkbox"/> Removal of Foreign Bodies |
| <input type="checkbox"/> Application of Bandages | <input type="checkbox"/> Skin Removal |
| <input type="checkbox"/> Cold/Heat Compression – Multiple Treatment | <input type="checkbox"/> Soaking Therapy – Multiple Treatment |
| <input type="checkbox"/> Cold/Heat Compression – Single Treatment | <input type="checkbox"/> Soaking Therapy – Single Treatment |
| <input type="checkbox"/> First Degree Burn Treatment | <input type="checkbox"/> Stitches/Sutures |
| <input type="checkbox"/> Heat Therapy – Multiple Treatment | <input type="checkbox"/> Tetanus |
| <input type="checkbox"/> Heat Therapy – Single Treatment | <input type="checkbox"/> Treatment for Infection |
| <input type="checkbox"/> Non-Prescriptive Medicine | <input type="checkbox"/> Treatment of 2 nd /3 rd Degree Burns |
| <input type="checkbox"/> None | <input type="checkbox"/> Use of Antiseptics – Multiple Treatment |
| <input type="checkbox"/> Observation | <input type="checkbox"/> Use of Antiseptics – Single Treatment |
| <input type="checkbox"/> Other (Specify) _____ | <input type="checkbox"/> Whirlpool Bath Therapy – Multiple Treatment |
| | <input type="checkbox"/> Whirlpool Bath Therapy – Single Treatment |
| <input type="checkbox"/> Prescription – Multiple Dose | <input type="checkbox"/> X-rays negative |
| <input type="checkbox"/> Prescription – Single Dose | <input type="checkbox"/> X-rays Positive/Treatment of Fracture |

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APPENDIX B, Fact Finding Flow Chart



NORTH WIND, INC.
ACCIDENT PREVENTION PLAN
ATTACHMENT 10
NWI HSP-11-006, MEDICAL SURVEILLANCE

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HSP-006

Medical Surveillance

Revision 2

August 28, 2006

Approved:

Bruce Miller (See letter number 156)
Director, Health and Safety

08/21/06
Date

Sylvia Medina (See letter number 156)
President

08/21/06
Date

REVISION HISTORY

Revision No.	Effective Date	Sections Affected	Description
0	11/20/05	All	This document supersedes ESH-006, Medical Surveillance, Revision 2.
1	12/05/05	All	Reformatted and revised.
2	08/28/06	All	Revised document numbers for corporate plans, policies, procedures, and forms, and corrected references to these documents, to reflect the number changes per Letter NW-2006-156. Also made minor formatting changes (i.e., moved definitions and acronyms to the front of the document and changed page numbers) per QAP-061_Rev 2.

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Appendix H, Example of HSF-006.4, Employee Vaccination25

DEFINITIONS

<i>Hazardous Waste Operations</i>	<p>Hazardous waste operations include :</p> <p>Cleanup operations required by a governmental body, whether federal, state, local, or other, involving hazardous substances that are conducted at uncontrolled hazardous waste sites (including, but not limited to, the EPA's National Priority Site List, state priority site lists, sites recommended for the EPA's National Priority Site List, and initial investigations of government identified sites which are conducted before the presence or absence of hazardous substances has been ascertained)</p> <p>Corrective actions involving cleanup operations at sites covered by the Resource</p> <p>Conservation and Recovery Act of 1976 (RCRA) as amended (42 U.S.C. 6901 et seq)</p> <p>Voluntary cleanup operations at sites recognized by federal, state, local, or other governmental bodies as uncontrolled hazardous waste sites</p> <p>Operations involving hazardous waste that are conducted at treatment, storage, and disposal facilities regulated by 40 CFR Parts 264 and 265 pursuant to RCRA; or by agencies under agreement with the U.S. EPA to implement RCRA regulations</p> <p>Emergency response operation for actual or threatened releases of hazardous wastes or substances regulated under the National Contingency Plan.</p>
<i>Medical Examination or Testing</i>	<p>Medical examinations or testing can include baseline, periodic, or exit hazardous waste examinations; biological monitoring tests; vaccinations; respirator questionnaire review; or drug testing.</p>
<i>Medical Provider</i>	<p>Medical provider refers to the physician that North Wind contracts with to provide medical exams for employees. A contract is established with a medical provider to serve each North Wind office or project location. The HSD and HRD establish new contracts with medical providers as necessary.</p>
<i>Physician</i>	<p>Here, physician refers to the doctor performing the medical exam.</p>

ACRONYMS

ADA	Americans with Disabilities Act
CDC	Centers for Disease Control
CPT	Cross Product Team

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EPA	Environmental Protection Agency
HRD	Human Resources Director
HRF	Human Resources Form
HSD	Health and Safety Director
HSP	Health and Safety Procedure
HSF	Health and Safety Form
MSP	Medical Surveillance Program
OSHA	Occupation Safety and Health Administration
PFT	Pulmonary Function Test
PM	Project Manager
SS	Site Supervisor
RCRA	Resource Conservation and Recovery Act

1. PURPOSE

This procedure represents North Wind's written medical surveillance program (MSP). This MSP has been prepared to address medical surveillance requirements covered under numerous regulatory requirements.

2. SCOPE

The North Wind MSP applies to all employees who do the following:

- Work at hazardous waste projects
- Handle potentially contaminated materials (blood borne pathogens)
- Perform laboratory work in laboratories, offices, field projects, and any other facilities
- Receive exposure to regulated substances covered by specific OSHA standards (for example, asbestos, lead, or cadmium)
- Use respirators
- Receive exposure to certain viruses (such as Hepatitis A, Hepatitis B, or Lyme's Disease)

North Wind subcontractors performing work at project sites where medical surveillance is required are responsible for developing their own medical surveillance program in compliance with applicable regulatory requirements and providing North Wind a copy of this program upon request.

3. RESPONSIBILITIES

3.1 Corporate Health and Safety Director

The Corporate Health and Safety Director (HSD) is responsible for:

- Managing the North Wind MSP and interfacing with the MSP occupational physicians to determine the requirements for occupational medical exams, including the content, frequency and specialized exams consistent with occupational exposures
- Reviewing project-specific documentation and determining appropriate medical surveillance requirements and applicable substance or regulatory-specific medical surveillance requirements, including reviewing project monitoring data to determine if action or trigger levels for medical surveillance applies
- Verifying that the medical provider, Human Resources Director (HRD), and MSP Coordinator have the appropriate information to implement the MSP

- Auditing and evaluating the MSP to ensure compliance with applicable regulatory medical surveillance requirements, to determine if changes in physical exam requirements are needed, and to determine if trends are noted with respect to exposures or exam requirements
- Interfacing with the medical provider on MSP or occupational medical issues or questions.

3.2 Human Resources Director

The HRD is responsible for notifying the HSD and MSP Coordinator about newly hired or terminating employees so that required MSP exams or test can be scheduled and maintaining North Wind employee files. The HRD is also responsible for providing the HSD with a copy of medical surveillance exam results for review and addressing American with Disabilities Act (ADA) issues.

3.3 Project Manager

The project manager (PM) is responsible for implementation of the MSP for each field project under their direction. They area also responsible for identifying staff who require medical examinations, approving such staff to receive examinations, scheduling employees for medical surveillance appointments at remote project locations or North Wind field offices, and notifying the HRD of new or terminating employees so that they can be enrolled in the MSP or exited from the program upon leaving the North Wind. PMs are also responsible for working with HRD regarding employee medical restrictions and addressing ADA issues.

3.4 Site Supervisor

The Site Supervisor (SS) is responsible for implementation of the MSP for each field project under their direction. The SS is also responsible for verifying implementation of the medical monitoring program for each project site or area under their control, including ensuring all employees have a current medical clearance (Fitness for Duty) form on file at North Wind. They are also required to notify the HRD and PM of any employee with medical restrictions. The SS is responsible for ensuring that North Wind subcontractors provide requested subcontractor medical surveillance information.

3.5 Medical Surveillance Program Coordinator

The North Wind MSP Coordinator is responsible for facilitating approval of MSP paperwork by the HSD for employees needing medical exams, working with the local and regional medical providers to schedule medical examinations, and inputting approved medical authorization forms and results into the MSP database.

3.6 Medical Provider

Medical provider refers to the local or regional physicians North Wind contracts with to provide medical exams for employees. A contract is established with a medical provider to serve each North Wind office or project location. The HSD and MSP Coordinator establish new contracts with medical providers as necessary. The medical provider is responsible for:

- Supporting the North Wind HSD to determine whether an employee is required to have annual, biennial, or exit exams based on the employee's submitted records and previous exams
- Scheduling examinations with the North Wind MSP Coordinator
- Reviewing the medical history provided by the employee at the time of their exam
- Conducting the medical exams and tests based on the North Wind provided MSP protocol (HSF-006.1, Authorization for Medical Exam) and based on specific medical exam findings
- Reviewing the medical results received from the exam, determining employee status, and completing HSF-006.2, Fitness for Duty or HSF-006.3, General Fitness for Duty, based on the nature of the medical exam.
- Maintaining North Wind employee (patient) medical records in accordance with applicable regulations.

4. PROCEDURE

4.1 Medical Examinations

Medical examinations are given to employees who conduct work at hazardous waste operations, work with potentially contaminated materials, work in laboratories, wear respirators, or work with OSHA regulated substances. The protocol consists of initial, annual, and exit examinations as described below. The protocol can range from completing a questionnaire (for example, periodic respirator clearance) to a medical examination with a medical history, physical examination and biologic testing (for example, periodic hazardous waste examination). The specific testing requirements are determined by the HSD based on the information provided by the employee. See Appendix A for specific medical examination protocols.

Although the frequency of the examinations varies (see Appendix B), all approvals expire at the end of the interval (such as 6 months, 1 year, or 2 years) from the date of the original examination.

4.1.1 Initial Examination

The purpose of the initial examination is to identify conditions that could place an employee at increased risk of health impairment as a result of the performance of their job, to identify work restrictions, and to establish a baseline for future comparisons. An employee should receive their initial exam prior to conducting the activity that requires medical monitoring. If training is associated with the activity (for example, 40-hour initial hazardous waste training), the medical clearance should be received before attending the training course. This precludes employees who have a condition that would prevent them from doing a certain job function (such as inability to wear a respirator) from taking training they will not be able to use. If the employee has a condition that precludes them from performing a certain job function, the supervisor or PM will contact the HRD and the HSD. If no concerns are raised by the medical examination, the employee can proceed with the health and safety training required for their job.

If an employee joins North Wind and has received a medical examination from their previous employer within the last six months, they should request that their previous medical provider send a copy of the results to the HRD to be forwarded to the HSD to determine if the exam meets North Wind's requirements for initial or baseline exams.

4.1.2 Periodic Examination

The purpose of the periodic examinations is the same as for the initial examination, except that they are also used to detect potential occupational exposures or illnesses that may have developed since the initial examination. Regulatory requirements, potential exposures, risk factors as identified by the employee, client requirements, and risk-based HSD decisions are used to determine the frequency of periodic examinations and type of testing. The HSD in conjunction with the medical provider will determine the type and frequency of the medical examination and testing based on the project safety analysis documentation. Typical frequencies are summarized in Appendix B; the various types of tests can be found in Appendix C (OSHA regulated substances) and Appendix A (includes the medical examination protocols).

4.1.3 Exit Medical Examination

The exit examination is for employees who have worked at sites with potential health and safety hazards since their last medical examination and who subsequently terminate employment or are no longer doing work that requires medical monitoring. The purpose is to document health status at the time of termination or exit. The elements of the examination are similar to the annual examination.

4.1.4 Vaccinations

Employees who are potentially exposed to certain viruses are eligible for vaccinations. See Appendix A for additional information on available vaccinations and medical examination protocols.

4.1.5 Drug and Alcohol Testing

North Wind employees are required to be drug and alcohol tested when contractually or legally obligated to have a drug-free workplace, or when good business practice would dictate as described below. See HRF-001.5, Drug/Alcohol Testing, for additional information.

4.2 MSP Implementation

4.2.1 Authorization

4.2.1.1 *Medical Examinations, Testing and Clearance*

The need for medical monitoring may be initiated in a number of ways including by the employee, the employee's supervisor, or the HSD (via the site-specific written safety plan). However the need is identified, when an employee starts doing work that requires a medical examination or testing, the supervisor completes the HSF-006.1, Authorization for Medical Exam, and submits it to the HSD for approval. HSD will then forward it to the MSP Coordinator to schedule the medical examination or tests. (Note: pre-employment drug screening will be performed in accordance with HRF-001.5, Drug/Alcohol Testing). The employee is then required to complete the medical questionnaire provided by the medical provider. The medical provider will then conduct the necessary physical exam and other occupational testing based on the medical exam protocol for type of medical clearance. The medical provider will document the medical clearance on a North Wind HSF-006.2, Fitness for Duty or HSF-006.3, General Fitness for Duty, depending on the specific protocol.

Employees who are enrolled in a MSP and that leave North Wind or no longer conduct work that requires medical surveillance will be exited from the MSP. If the employee has not been on site, in an exposure situation, or does not exhibit symptoms of exposure, the last periodic examination can be used as the exit examination. If the HSD determines that the employee cannot use their last periodic examination as their exit examination, the project safety analysis documentation will be evaluated and used to authorize the examination. If an employee has left the company without completing a required exit examination, the HRD is responsible for contacting the individual and requesting they report to the medical provider for an exit medical examination or test. If the employee does not respond to the HRD's requests by a required date, then the employee will be exited from the MSP without a medical exam. This will be documented by the HRD and HSD in the employee's personnel file.

4.2.1.2 *Respiratory Clearance*

When it is determined that an employee requires stand-alone respirator clearance (not conducted in conjunction with an occupation medical exam), the employee's supervisor is required to complete a HSF-06.1, Authorization for Medical Exam, and return it to the MSP Coordinator. The MSP Coordinator will then forward it to the HSD for approval and schedule the exam with the medical provider. The employee is then required to complete the respirator user questionnaire provided by the medical provider. The medical provider will then conduct the necessary

pulmonary function test(s) (PFT) for the respirator clearance. The medical provider will document the respirator clearance on a North Wind HSF-006.2, Fitness for Duty.

Respiratory clearance expires one year after the initial clearance date. The MSP Coordinator will contact the employee and schedule a PFT with the medical provider. When respiratory clearance is no longer needed, the employee's supervisor contacts the MSP Coordinator. The MSP Coordinator will notify the HSD when the employee no longer requires a respirator clearance. No exit examination or testing is required.

4.2.1.3 Vaccinations

When it is determined that an employee requires vaccinations to ensure health while performing their work, the employee's supervisor is required to complete HSF-006.1, Authorization for Medical Exam, requesting the vaccinations. The supervisor returns the form to the MSP Coordinator, who forwards it to the HSD for authorization for the vaccinations. The MSP Coordinator will then contact the employee to schedule the vaccinations. The frequency of the follow up vaccinations varies depending on the type of vaccination required. The MSP Coordinator tracks the vaccinations to ensure that any additional follow up vaccinations are scheduled. Common vaccinations North Wind may require can be found in Appendix B. If an employee refuses the initial or follow up vaccinations, a release form must be completed by the employee (Appendix D).

4.2.1.4 Drug and Alcohol Testing

Pre-employment drug and alcohol testing and testing where there is reasonable suspicion of alcohol or drug use on the job is conducted in accordance with HRF-001.5, Drug/Alcohol Testing. Where project related drug and alcohol testing based on reasonable suspicion is required, the employee's supervisor will notify the HRD for authorization. The employee will then be required to report to the medical provider and provide a urine specimen. If an employee refuses to provide a urine specimen, this constitutes grounds for termination and the supervisor will contact the HRD for further actions. The medical provider will report the testing results to the HRD, who will in turn, notify the supervisor and HSD. The HRD will place the testing results in the employees file and take other administrative actions on a case-by-case basis. No exit examination or testing is required.

4.2.2 Scheduling

4.2.2.1 Employee

Once the MSP Coordinator receives approval to schedule an examination, vaccination, or testing, they contact the employee and coordinate an appointment with the medical provider. As confirmation the appointment has been scheduled, the MSP Coordinator will send the employee an e-mail with the appointment information. The employee's supervisor will provide the employee with the appropriate project charge number to use for the medical exam. It is the employee's responsibility to report to the medical provider's location at the specified appointment time. Failure to cancel or missing a scheduled appointment without notifying a supervisor or the

MSP Coordinator so the appointment can be rescheduled will lead to administrative or disciplinary actions.

4.2.2.2 Medical Provider

Prior to the examination, vaccination, or drug and alcohol testing, the MSP Coordinator will fax a copy of the HSF-006.1, Authorization for Medical Exam with the testing protocol to the medical provider. This protocol informs the medical provider of the tests to be performed.

4.2.3 Analysis of Results

The medical provider will submit the results of the medical exam or testing to the North Wind HRD as authorized by the Form 501 release. The HRD will then submit the results to the HSD for review. Centralizing the review of the data is required to ensure consistency. Where abnormal or medical results require additional medical surveillance, the HSD will inform the MSP Coordinator to schedule the appropriate appointments. The HSD may consult with the medical provider based on the results.

4.3 Notification of Results and Recordkeeping

The medical provider provides a “physician’s written opinion” by completing and signing a North Wind’s HSF-006.2, Fitness for Duty or HSF-006.3, General Fitness for Duty. If medical restrictions are placed on the employee, they will be documented on the HSF-006.2 or HSF-006.3. A copy of the physician signed HSF-006.2 or HSF-006.3 will be scanned and entered into the North Wind document control system by the MSP Coordinator. All other medical record will be submitted by the medical provider to the HRD for filing in the employee’s personnel file.

Additionally, each employee receives directly from the medical provider, at their home address, a written summary of the medical examination that includes the examination results, the findings related to the employee's ability to work, any medical conditions that require further treatment or examination, and diagnoses or recommendations not related to the employee's work assignment. This summary typically arrives within four weeks of the medical exam. This written summary may vary depending on the medical provider.

5. RECORDS

The following records shall be maintained by the Health and Safety Director in accordance with QAP-171, Records Control:

- HSF-006.1, Authorization for Medical Exam
- HSF-006.2, Fitness for Duty
- HSF-006.3, General Fitness for Duty
- HSF-006.4, Employee Vaccination Delineation

- Medical Provider physical exam or testing results

6. REFERENCES

HRF-001.5, Drug/Alcohol Testing

HSF-006.1, Authorization for Medical Exam

HSF-006.2, Fitness for Duty

HSF-006.3, General Fitness for Duty

HSF-006.4. Employee Vaccination Delineation

29 CFR 1910.120, “Hazardous Waste Operations and Emergency Response”

APPENDIX A, Medical Exam Protocols

Initial	Annual/Exit	Hazardous Waste Medical Examination Protocol Physical Examination and Standard Tests	
		Exam/Test	Protocol
x	x	History and Physical Exam	Use North Wind Provided Forms unless not available
x	*	EKG	Resting, 12 lead
x	x	Spirometry	Limited to standard flow rates; includes FVC, FEV ₁ , FEV ₁ /FVC
x	x	Audiometry	0.5K to 8K (29 CFR 1910.95)
x	x	Visual Acuity	Standard visual screen, including standard Snellen chart for acuity and color blindness
x	x	CBC	With differential and platelet evaluation
x	x	Routine Urinalysis	With Microscope
x	x	Blood Chemistries	Chem 24 or equivalent
*	*	OSHA Substance Standard Testing	In accordance with OSHA substance specific biological monitoring or as directed by the occupational physician.
*	*	Chest x-ray	Performed at initial exam. <ul style="list-style-type: none"> - Annual exam under age 40 not included - Ages 45-50 every 5 years. - Over 50 years every 2 years - PA view only (explain on examination form)
*	*	Treadmill EKG or Stress Test	Only if medically indicated (explain on examination form)
*	*	Tetanus Immunization	As Needed

* As needed

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Initial	Annual/Exit	Biological Monitoring Tests	
		Agent	CPT or Protocol
	*	Arsenic	CPT Code 82175 (whole blood) or in conjunction with other heavy metal profile (heavy metal profile I – arsenic, lead, mercury; heavy metal profile II – arsenic, cadmium, lead, mercury) or as directed by the occupational physician
	*	Cadmium	CPT Code 82300 (whole blood) or in conjunction with other heavy metal profile II – arsenic, cadmium, lead, mercury) or as directed by the occupational physician
	*	Chrome VI	CPT Code 82495 (plasma) or CPT Code 82570 (urine); BEI total chromium in urine (25 µg/l end of shift, 10 µg/l increase during shift)
	*	Lead Absorption Profile	CPT Code 83655, (lead/ZPP standard profile) or in conjunction with other heavy metal profile (heavy metal profile I – arsenic, lead, mercury; heavy metal profile II – arsenic, cadmium, lead, mercury) or per occupational physician
	*	Mercury	CPT Code 83825 (whole blood) or in conjunction with other heavy metal profile (heavy metal profile I – arsenic, lead, mercury; heavy metal profile II – arsenic, cadmium, lead, mercury) or as directed by the occupational physician
	*	PCBs	CPT Code 82441 (serum or plasma) or as directed by the occupation physician
	*	RBC Cholinesterse	CPT Code 82482 (serum or plasma RBC) or as directed by the occupation physician
	*	Pesticide Screen	CPT Code 82441 (serum or plasma) or based on the specific pesticide/biological indicator as directed by an occupational physician
	*	Carbon Monoxide	CPT Code 82375 (whole blood) carboxyhemoglobin; BEI (3.5% of hemoglobin or carbon monoxide in end-exhaled air (20 ppm)

* As needed

CPT = *Current Procedural Terminology*, a publication of the American Medical Association.

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Initial	Annual/Exit	Vaccination	Protocol
*		Hepatitis A	Series of 2 injections. Initial dose 2-4 weeks prior to departure. Second dose 6-12 months after initial
*		Hepatitis B	Series of 3 injections. Initial dose, 1 month and 6 months from the date of the 1st injection
*		Tetanus	Every 10 years
*		Typhoid	Oral or injectable, single dose
*		Yellow Fever	Single dose injectable. Booster every ten years
*		Measles, Mumps, Rubella	Adults receive one booster
*		Polio	Booster if received previous immunization. If not, 3 dose series 4 weeks apart
*		Other	Other vaccinations are available and recommended in accordance to the destination and current public health issues of the country to be visited. CDC/Travel recommendations should be reviewed prior to departure. Most immunizations need 2-4 weeks to become effective

* As needed based on occupational physician and CDC recommendations

Initial	Annual/Exit	Respirator	
x	x	Questionnaire	Respirator questionnaire completed and submitted to the medical provider. Initial and annually reviewed for changes. No exit is required
x	x	PFT	Limited to standard flow rates; includes FVC, FEV ₁ , FEV ₁ /FVC. No exit is required.

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Initial	Annual/Exit	Drug and Alcohol Screening/Testing	
		Drug Screening/Testing	Screening 10 panel, NIDA cutoffs CPT Code 80100 (urine) HHS/DOT guidelines
x	x	Alcohol Screening/Testing	Screening (breathalyzer) CPT Code 82055 (whole blood)

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APPENDIX B, Typical Examination, Vaccination, and Testing Frequency

Typical Examination, Vaccination, and Testing Frequency									
Examination Type	Initial	Periodic							Exit
		Every 6 mo	Annually	Every 2 yrs	Other Scheduled Interval	Random	Post-exposure	Post-incident	
Hazardous waste	x		2	3			6		8
OSHA regulated substances	x	1					6		x
Respirator user	x	1	x				6		
Laboratory worker	x		2				6		
Field personnel (non Hazardous waste)	x								
Vaccinations	x				4		7		
Drug & alcohol screening/testing	x				5	5		x	

- 1 – As required by OSHA substance-specific standard
- 2 – If more than 30 days/yr onsite, potential exposures identified by project safety analysis, or more than 23 months since last medical examination
- 3 – If less than 30 days/yr onsite, no potential exposures identified by project safety analysis, and most recent medical examination within 12 months
- 4 – Based on potential for exposure (bloodborne pathogens) and Appendix A
- 5 – Based on 10 CFR 707 requirements
- 6 - If test is available for substance employee was exposed to and as recommended by occupation physician
- 7 - (bloodborne pathogens) Hepatitis B if employee not previously vaccinated
- 8 – If last annual medical examination was not within last 6 months or as recommended by occupation physician.

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APPENDIX E, Specific OSHA Regulated Substances Medical Testing Protocol

OSHA has specific medical monitoring requirements for employees who are exposed to specific substances. This table summarizes the OSHA regulated compounds that North Wind commonly encounters. Employees who are potentially exposed above the action level as indicated must be medically monitored for the compound. The need for this type of medical monitoring will be identified in the site-specific written safety plan and accomplished as described in Section 4.1.2.

Regulated Substance	Exposure Limits (Permissible Exposure Limit (PEL), Action Level (AL), Short Term Exposure Limit (STEL) or Excursion Limit	Criteria for Testing
Asbestos 29 CFR 1910.1001 29 CFR 1926.1101	PEL: 0.1 fibers/cc Excursion Limit: 1f/cc (30 minutes)	Exposure at or above the PEL or excursion limit
Inorganic Arsenic 29 CFR 1910.1018	AL: 5 µg/m ³	Exposure above the AL for 30 days or more per year
Benzene 29 CFR 1910.1028	PEL: 1.0 ppm AL: 0.5 ppm STEL: 5 ppm	Exposures at or above the AL for 30 days or more per year and exposure at or above PEL for 10 days or more per year
Cadmium 29 CFR 1910.1027	PEL: 5 µg/m ³ AL: 2.5 µg/m ³	Exposure at or above AL for 30 days or more per year
Lead 29 CFR 1910.1025 29 CFR 1926.62	PEL: 50 µg/m ³ AL: 30 µg/m ³	<u>1910</u> : Exposure above AL for 30 days or more per year. <u>1926</u> : Make available if exposure at or above AL on any day. Institute if exposure at or above AL for 30 days or more per year
Formaldehyde 29 CFR 1910.1048	PEL: 0.75 ppm AL: 0.5 ppm STEL: 2 ppm	Make available if signs and symptoms of exposure develop. Institute if exposures at or above AL or above STEL on any day.
Vinyl Chloride 29 CFR 1910.1017	PEL: 1 ppm AL: 0.5 ppm STEL: 5 ppm	Exposure above AL on any day

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Regulated Substance	Exposure Limits (Permissible Exposure Limit (PEL), Action Level (AL), Short Term Exposure Limit (STEL) or Excursion Limit	Criteria for Testing
Methylene Chloride 29 CFR 1910.1052	PEL: 1 ppm AL: 0.5 ppm STEL: 5 ppm	Exposure at or above AL for 30 days or more per year. Exposures above PEL or STEL for 10 days or more per year. Exposures above PEL or STEL on any day and identified as being at risk due to cardiac disease.
Noise 29 CFR 1910.95	AL: 85 dBA	Exposure at or above the 8- hour AL on any day



APPENDIX F, Example of HSF-006.1, Authorization for Medical Examination



AUTHORIZATION FOR MEDICAL EXAMINATION

EMPLOYEE COMPLETES:

NAME _____ OFFICE: _____
(LAST) (FIRST) (MIDDLE)

SS# NO. _____ BIRTHDATE _____ BADGE# _____ (as applicable)

ADDRESS: _____

I consent to this examination and authorize the release of the medical lab results and exam summary to the North Wind Health and Safety Officer or his/her designee.

Employee Signature _____ Date _____

THE NORTH WIND HEALTH AND SAFETY DIRECTOR (HSD) OR DESIGNEE COMPLETES:

EXAM TYPE: Initial Periodic Exit Executive Exposure Evaluation Site-Specific Periodic

COMPONENTS REQUIRED FOR THIS EXAM:

INITIAL HAZWOPER & RESPIRATOR:

- Review personal and occupational health history
- Physical Exam/Visual acuity
- Spirometry (FEV, FVC)
- Audiometry (0.5K to 8K)
- Resting EKG (12 Lead)
- Blood workup*
- Chest x-ray (PA & lateral view)
- Urinalysis
- *Blood Chemistry (26 profile) and CBC with differential & platelets

PERIODIC/EXIT HAZWOPER:

- Review personal and occupational health history
- Physical Exam/Visual acuity
- Resting EKG (12 Lead) (as deemed appropriate)
- Blood workup*
- Urinalysis

EXECUTIVE PHYSICAL:

- Review personal history
- Physical Exam
- Resting EKG (12 Lead) (as deemed appropriate)
- Blood workup*
- Urinalysis

ADDITIONAL AUTHORIZATION INSTRUCTION

- ___ (Periodic) Audiometry (0.5K to 8K) for periodic if enrolled in Hearing Conservation Program
- ___ (Periodic) Spirometry (FEV, FVC) if respirator qualification required
- ___ (Periodic) Urine Drug Screen Collection (NIDA 5 Panel or equivalent)
- ___ PCB/Pesticide Screen Collection (blood)
- ___ Urine Heavy Metals Collection (Request specific target metals)
- ___ Electrocardiogram (12 lead)
- ___ Periodic Chest x-ray (PA & Lateral View)
- ___ Blood Lead/ZPP
- ___ Other _____

****FOLLOW LAB-SUPPLIED PROTOCOLS FOR ALL REQUESTED SPECIMEN COLLECTIONS****

The North Wind HSD or designee authorizes those exam components listed above:

PRINTED NAME: _____ SIGNATURE: _____ DATE: _____

NORTH WIND CHARGE CODE: _____

EXAM DATE: _____ CLINIC: _____

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APPENDIX G, Example of HSF-006.2, Fitness for Duty



FITNESS FOR DUTY

NORTH WIND, INC.
Corporate Office
P.O. BOX 51174
1425 Higham St. Idaho Falls, ID 83405
Phone (208) 528-8718 Fax (208) 528-8714

NAME	POSITION	DATE OF EXAM	SS#
EXAM TYPE	<input type="checkbox"/> BASELINE/INITIAL	<input type="checkbox"/> PERIODIC/ANNUAL	<input type="checkbox"/> TERMINATION

RESPIRATORY PROTECTION EQUIPMENT USAGE 29 CFR 1910.134

- UNLIMITED** - Persons with medical history, physical examination and spirometry that present no significant concern for the ability to perform work duties while wearing respiratory protection.
- LIMITED** - Persons with findings on medical history, physical examination, spirometry or testing that present moderate concern for the ability to perform work duties while wearing respiratory protection. Worker may wear respiratory protection but must be observed while doing so.
- RESTRICTED** - Persons with abnormal spirometry and/or cardiovascular or medical conditions are restricted to positive pressure-demand respirators only.
- DISQUALIFIED DUE TO** - _____

FITNESS FOR DUTY 29 CFR 1910.120 and 1910.20

I have examined this worker and do not find any medical condition that would place this individual at increased risk of health impairment from engaging in Hazardous Waste Operations work, Emergency Response or assigned duties associated with the position listed above. This includes the use of all required personal protective equipment.

Worker is medically qualified for Confined Space Entry work (no identifiable risk of sudden incapacitation).

Worker has treatable limitations that restrict full participation in hazardous waste operations work, emergency response, confined space entry, wearing of required personal protective equipment or performance of assigned duties as indicated below:

1. Work function limitations: _____
2. Duration of restrictions: _____

Worker is **NOT** medically qualified to perform the hazardous waste operations, emergency response, confined space entry or required work duties due to: _____

Additional Comments: _____

In accordance with OSHA requirements, I have informed the above named individual of the results of his/her medical examination and of any medical condition that may result from his/her exposure to physical hazards and/or hazardous materials associated with assigned duties.

PHYSICIAN _____ ADDRESS _____
PRINT

SIGNATURE _____ DATE _____

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APPENDIX H, Example of HSF-006.3, General Fitness for Duty



GENERAL FITNESS FOR DUTY

North Wind, Inc.
Corporate Office
P.O. BOX 51174, Idaho Falls, ID 83405
Phone (208) 528-8718 Fax (208) 528-8714

NAME	POSITION TITLE	DATE OF PHYSICAL EXAM	SSN#

Position Description: (list duties and physical requirements for the position such as lifting, walking or hiking, standing for extended periods, carrying equipment, working outdoors in summer or winter, etc.)

GENERAL PHYSICAL FITNESS FOR DUTY

Check the appropriate box based on the physical examination findings, laboratory tests, medical history review, and patient statements. (As Applicable)

- I have conducted a physical examination on this worker, reviewed their medical history, and do not find any medical condition that would place this individual at increased risk of health impairment from engaging in the position listed and duties described above. This includes the use of required personal protective equipment such as a hard hat, safety glasses, safety-toed boots, and work clothing.
- Worker has treatable limitations that restrict full participation in the position duties as described above, wearing of required personal protective equipment or performance of assigned duties as indicated below:
1. Work function Limitations: _____
 2. Duration of restrictions: _____
- Worker is **NOT** medically qualified to perform the work duties described above.

Additional
Comments: _____

PHYSICIAN _____ ADDRESS _____
Print

SIGNATURE _____ DATE _____

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**APPENDIX H, Example of HSF-006.4, Employee Vaccination
Delineation**



EMPLOYEE VACCINATION DELINEATION

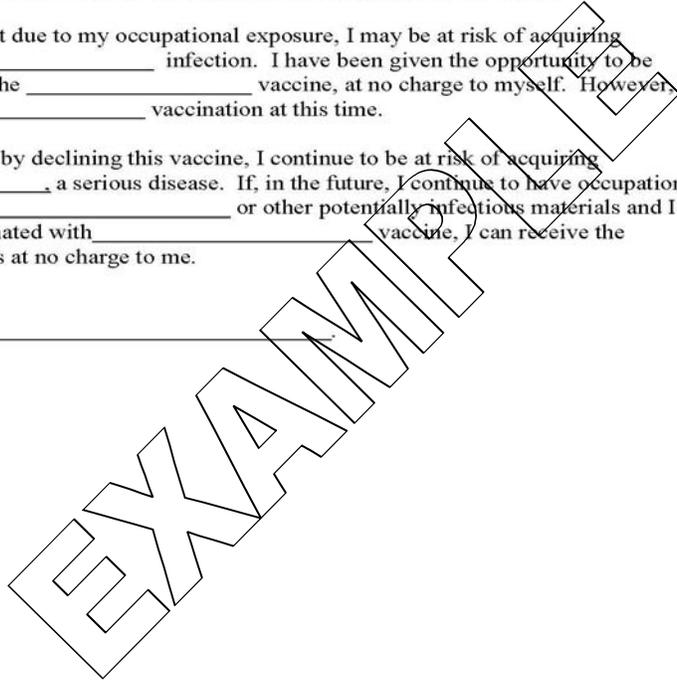
Vaccination Delineation

The Occupational Safety and Health Administration requires the following declination form to be signed in the event an employee declines the above vaccination.

"I understand that due to my occupational exposure, I may be at risk of acquiring _____ infection. I have been given the opportunity to be vaccinated with the _____ vaccine, at no charge to myself. However, I decline _____ vaccination at this time.

I understand that by declining this vaccine, I continue to be at risk of acquiring _____, a serious disease. If, in the future, I continue to have occupational exposure to _____ or other potentially infectious materials and I want to be vaccinated with _____ vaccine, I can receive the vaccination series at no charge to me.

Signed _____



NORTH WIND, INC.
ACCIDENT PREVENTION PLAN
ATTACHMENT 11
NWI HSP-11-007, RESPIRATORY PROTECTION

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HSP-007

Respiratory Protection

Revision 1

August 28, 2006

Approved:

Bruce Miller (See letter number 156)
Director, Health and Safety

08/21/06
Date

Sylvia Medina (See letter number 156)
President

08/21/06
Date

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1. PURPOSE

The purpose of this program is to ensure the protection of all employees from respiratory hazards, through proper use of respirators. North Wind will control, as far as feasible, occupational exposure to air contaminated with harmful dusts, fibers, fogs, fumes, mists, smokes, sprays, gases, or vapors by instituting accepted engineering control measures. Respiratory protection may only be used when engineering controls are not feasible, are ineffective in reducing exposure to an acceptable level, or while they are being instituted.

2. SCOPE

This program applies to all North Wind and subcontractor employees who potentially may be required to wear respiratory protection while at North Wind controlled project areas. Respiratory protection includes half-face and full-face air-purifying respirators (APR), powered air-purifying respirators (PAPR), supplied-air respirators (SAR), and self-contained breathing apparatus (SCBA).

Some elements of this Program may also apply to employees who voluntarily wear respiratory protection for comfort or nuisance protection or for the use of filtering face piece respirators (dust masks) (Appendix I, "Use of Respirators When not Required Under 29 CFR 1910.134, Respiratory Protection Standard."

The North Wind Corporate Health and Safety Director (HSD) will administer the Respiratory Protection Program and will serve as the Respiratory Protection Program Administrator.

3. RESPONSIBILITIES

3.1 Corporate Health and Safety Director

The HSD is responsible for:

- Determining, with assistance from the site supervisor (SS) and site safety officer (SSO), that all feasible engineering controls have been considered before requiring employees to wear respiratory protection
- Determining the appropriate respiratory protection to be used and specifying in the project hazard analysis documentation
- Developing a cartridge and canister change-out schedule for APR use and specifying it in the project hazard analysis documentation
- Making appropriate changes to the respiratory protection selection process and cartridge and canister change-out schedule as necessary
- Assisting the SSO to resolve deficiencies noted during self-assessments

- Consulting with respirator users to obtain their views of program effectiveness during project health and safety audits
- Informing the Respiratory Protection Program Administrator of any deficiencies noted during a audits, SSO or SS self-assessment, or any complaints or concerns raised by individual employees
- Reviewing a subcontractor's respiratory protection procedures as specified in Section 5.12 of this Program.

3.2 Site Safety Officer

The SSO or SS (if serving in the SSO capacity) is responsible for:

- Determining, with assistance from the HSD, that all feasible engineering controls have been considered before requiring employees to wear respiratory protection
- Verifying respirator users meet the provisions of this procedure regarding training, medical evaluations, and fit testing
- Performing fit testing, as necessary, and sending records to the Medical Surveillance Program Administrator (HSD)
- Distributing "Use of Respirators When not Required Under 29 CFR 1910.134, *Respiratory Protection Standard*" (Appendix I) to employees using respirators voluntarily
- Obtaining appropriate respiratory protection as specified in the project hazard analysis documentation
- Monitoring respirator use, inspection, cleaning, storage, and repair performed by respirator users
- Verifying cartridge and canister are replaced according to the change-out schedule specified in the project hazard analysis documentation
- Verifying that monthly inspections of emergency respirators are conducted and documented
- Sending defective respirators to the equipment manager for repair
- Routinely evaluating respirator use and notifying the HSD of any changes from the expected site conditions that could affect respirator effectiveness
- Notifying the HSD of any gas or vapor breakthrough events

- Verifying cylinders and compressors supplying breathing air meet the provisions of this procedure
- Resolving any and all deficiencies noted during self-assessments, with assistance from the HSD.

3.3 Respirator Users

Respirator users are responsible for:

- Completing appropriate respirator training before initial use and annually thereafter
- Completing the respirator medical evaluation process and limiting respirator use to those who are deemed medically qualified by a physician
- Completing respirator fit testing before initial use and annually thereafter if required to wear a respirator
- Limiting respirator use to those situations identified in the project hazard analysis documentation
- Being clean shaven when using tight-fitting face piece respirator (no facial hair that will interfere with the face-to-face piece sealing surface)
- Inspecting respirators before each use and during cleaning
- Removing defective respirators from service and notifying the SSO or SS
- Performing user seal check before each use of a tight-fitting face piece respirator
- Replacing cartridges and canisters according to change-out schedule specified in the project hazard analysis documentation
- Leaving the respirator area immediately and notifying the SSO or SS if a gas or vapor breakthrough is detected
- Cleaning and disinfecting respirators to ensure their clean and sanitary condition
- Storing respirators to protect them against contamination and deformation
- Making only routine repairs to respirators and informing the SSO or SS of respirators that are defective beyond routine repair
- Not entering immediately dangerous to life or health (IDLH) atmospheres until a standby person is established with appropriate equipment

- Reporting to the SSO (who will in turn report to the North Wind HSD any medical sign or symptom related to respirator use, or changes in workplace that result in substantial increase in physiological burden.

3.4 Medical Provider

Medical provider refers to the local or regional physicians North Wind contracts with to provide medical exams for employees. A contract is established with a medical provider to serve each North Wind office or project location as described in North Wind [HSP--006](#), *Medical Surveillance Program*.

4. PROCEDURE

This procedure constitutes a written program for respirator selection and use at North Wind project sites for employees. This program shall be adhered to and may not be changed without written approval of the HSD.

To comply with OSHA regulation 1910.134, *Respiratory Protection*, the following elements are required to be part of a written respiratory protection program:

- Respirator training (Section 4.1)
- Medical evaluations (Section 4.2)
- Fit testing procedures (Section 4.3)
- Procedures for selecting respirators (Section 4.4)
- Procedures for proper respirator use (Section 4.5)
- Procedures for inspecting respirators (Section 4.6)
- Procedures for cleaning and disinfecting respirators (Section 4.7)
- Procedures for storing respirators (Section 4.8)
- Procedures for repairs and maintenance of respirators (Section 4.9)
- Procedures to ensure adequate air quality for atmosphere-supplying respirators (Section 4.10)
- Procedures for regularly evaluating the effectiveness of the program (Section 4.11)
- Provisions for evaluation of a subcontractor's program (Section 4.12)

10 CFR 835, *Occupational Radiation Protection* provides additional requirements for respirators use to be worn in Radiologically Controlled Areas. No entry into a Radiological Contamination or Airborne Radioactivity Area is permitted without authorization by the North Wind SSO or SS in consultation with the HSD and proper radiological work control documents (i.e. radiological work permit) in accordance with 10 CFR 835 and North Wind [HSP-001](#), *Project Safety Analysis*.

All North Wind personnel who wear a respirator shall participate in and adhere to the provisions of this procedure.

4.1 Training

Employees who are required to wear respiratory protection shall successfully complete appropriate respirator training before initial respirator use and annually thereafter.

Retraining shall be provided when changes in the workplace or type of respirator used render previous training obsolete. Retraining shall also be provided when inadequacies in the user's knowledge about or use of a respirator indicates that they have not retained the requisite understanding or skill in respirator use.

Employees who use respirators when they are not required (volunteer use) are not required to complete respirator training, but are required to follow the requirements identified in Appendix I "Use of Respirators When not Required Under 29 CFR 1910.134, "Respiratory Protection" Standard.". The SSO or SS shall ensure Supplement 1 is read and signed requesting to wear respiratory protection when employees are not required to under the 29 CFR 1910.134, *Respiratory Protection* standard.

Training shall address the following:

- Why the respirator is necessary and how improper fit, usage, or maintenance can compromise the protective effect of the respirator
- What the limitations and capabilities of the respirator are
- How to inspect, put on and remove, use, and check the seals of the respirator
- What the procedures are for maintenance and storage of the respirator
- How to recognize medical signs and symptoms that may limit or prevent the effective use of respirators
- Instruction on how to deal with emergency situations involving respirator use as well as respirator malfunction
- A review of OSHA regulation 1910.134, *Respiratory Protection*, as well as the contents of this written program and its location and availability.

NOTE: *Additional training regarding respirator use in radiologically controlled areas is required prior to entry into airborne radioactivity areas in accordance with 10 CFR 835, Occupational Radiation Control and applicable facility-specific supplemental procedures.*

4.2 Medical Evaluations

Employees who are required to wear respiratory protection shall have a medical evaluation completed before the respirator fit test or prior to using a respirator when fit testing is not required. Medical evaluation is also required when an employee voluntarily uses a negative pressure APR. Medical evaluation is not required when an employee voluntarily uses a filtering face piece respirator (dust mask).

Employees assigned to tasks requiring the use of respirators shall be identified by their project manager or SS and evaluated medically for respirator use. Employees will be evaluated by a licensed physician to determine their ability to wear a respirator during their assigned job duties per North Wind [HSP-006](#), *Medical Surveillance Program* and 29 CFR 1910.134, Respiratory Protection. A short summary of the medical evaluation requirements is provided below:

- A physician shall perform a medical evaluation through the use of the OSHA 29 CFR 1910.134, *Respiratory Protection*, Appendix C Medical Questionnaire.
- A follow-up examination may be required based on the results of the questionnaire or initial exam.
- The consulting physician shall provide a written recommendation or opinion regarding an employee's ability to use respiratory protection including any limitations. This written opinion will be documented on a HSF-006.2, *Fitness for Duty* as described in HSP-006.

If, after using respiratory protection, an employee experiences any medical signs or symptoms that may be related to their ability to use a respirator or changes in the workplace result in a substantial increase in the physiological burden placed on the employee, the employee shall contact the SSO who will contact the HSD to discuss this information. The employee shall be removed from duties requiring respiratory protection until the HSD informs the consulting physician of this information and can determine the necessary changes to the original fitness for duty declaration and any subsequent medical restrictions.

4.3 Respiratory Fit Testing

After receiving a medical clearance (authorization by a physician via the HSF-006.2, *Fitness for Duty*), employees using a tight-fitting respirator facepiece (negative or positive pressure) shall pass an appropriate fit test before initial use and annually thereafter. Additional fit testing shall be conducted for the following reasons:

- Changes occur in the employee's physical condition that could affect the fit of the facepiece (that is, facial scarring, cosmetic surgery, dental changes, or an obvious change in body weight).
- The facepiece to be worn is different in size, style or model, than the facepiece used during the fit test.
- After passing a fit test, the employee determines the facepiece fit to be unacceptable.

Fit testing is not required when an employee voluntarily uses a filtering facepiece respirator (dust mask).

The fit test shall be conducted using the same size, style, and model of respirator facepiece that will actually be used by the employee. Qualitative (QLFT) or quantitative (QNFT) fit tests shall be administered using an OSHA-accepted protocol listed in Attachment 2. A QLFT may be used for all positive pressure respirators and for negative pressure APR that must have a protection factor of 10 or less. A QNFT shall be used for SAR and SCBA used in negative pressure mode (demand mode) or full-face APR which require a protection factor greater than 10.

Employees shall contact their North Wind Training Coordinator (TC) to schedule a respirator fit test before initial respirator use, annually, and when additional fit testing is required. Only individuals trained in fit testing protocols shall be allowed to perform respirator fit testing. All fit test records shall be sent to and maintained by the North Wind TC.

4.4 Respirator Selection

Air contaminated with harmful dusts, fibers, fogs, fumes, mists, smokes, sprays, gases, or vapors shall be controlled, as far as feasible, by accepted engineering control measures. Respiratory protection shall be used only when engineering controls are not feasible, are ineffective in reducing exposure to an acceptable level, or while they are being instituted. The HSD and SSO or SS shall determine that all feasible engineering controls have been considered before requiring employees to wear respiratory protection.

Selection of appropriate respiratory protection for field activities is by necessity a dynamic process reflecting the way conditions can change and the numerous selection variables. Therefore, selection cannot be based on static decision logic, no matter how well defined. Instead, selection must be based on a site-specific evaluation as well as on the professional judgment of the HSD and SSO or SS.

A selection guideline is provided in Appendix C to assist the HSD in determining the appropriate respiratory protection. The HSD shall identify the selected respiratory protection and any limitations of their use in the project safety analysis documentation.

If an APR without an end-of-service-life indicator (ESLI) will be used, the HSD shall be contacted to develop a cartridge and canister change-out schedule using the guidelines provided in Appendix E and provide this schedule in the project safety analysis documentation.

The SSO or SS, with assistance from the Project Manager, shall obtain appropriate HSD approved respiratory protection

4.5 Respirator Use

Respirator use shall be limited to those identified in the project safety analysis documentation and shall be used within their limitations. The SSO or SS must routinely evaluate respirator use to verify proper use and effectiveness. The SSO or SS shall notify the HSD of any change from the expected site conditions that may alter the effectiveness (performance and reliability) of the selected respiratory protection. The HSD shall then make appropriate changes to the selection process. Some examples of changes in site conditions that may affect respiratory protection selection include the following:

- Exposure to additional contaminants
- Higher than expected exposure levels
- Engineering controls not as efficient as expected
- Changes in Environmental conditions (temperature and humidity) and work practice (higher work load demand)
- Respirator user comments or complaints on respirator effectiveness.

Respirator users shall inspect their respirators, as outlined in Section 4.6, to ensure that they are good working order and are in clean and sanitary condition.

No respirator user with a tight-fitting respirator facepiece shall have facial hair or any other condition that interferes with the facepiece seal or value function. The user shall perform a user seal check, as outlined in Appendix E, before each use.

Contact lenses may be worn with respiratory protection, provided they do not interfere with the function of the respirator.

Respirator cartridges and canisters shall be labeled and color coded with a National Institute for Occupational Safety and Health (NIOSH) approval label and this label shall not be removed or made illegible. The SSO or SS shall verify that cartridges and canisters are replaced according to the change-out schedule provided in the project safety analysis documentation. Respirator users shall notify the SSO or SS of any detection of vapor or gas breakthrough. The SSO or SS shall report any breakthrough events to the HSD for schedule upgrade.

Employees shall be allowed to leave the respirator use area for the following reasons:

- To wash their face and respirator facepiece as necessary to prevent eye or skin irritation

- If they detect vapor or gas breakthrough, changes in breathing resistance, or leakage of the facepiece
- To replace the respirator filter, cartridge, or canister elements.

In immediately dangerous to life or health (IDLH) atmospheres, at least one employee shall be located outside the IDLH area (the standby person). The standby person shall be responsible for the following:

- Maintain communication with the employee inside the IDLH area
- Have sufficient training to provide effective emergency rescue
- Have the necessary retrieval equipment and an SCBA or positive pressure SAR with auxiliary self-contained air supply
- Notify the SSO or SS before entering the IDLH area for rescue purposes.

4.6 Respirator Inspection

The SSO or SS shall, in conjunction with the wearer, inspect respirators before they are sent to the field. Respirators in regular use shall be inspected by the wearer before each use and during cleaning of the respirator.

Where required, emergency response respirators shall be inspected monthly and shall be checked for proper function before and after each use. Documentation of the monthly inspection shall be kept with the emergency respirators. Inspection procedures for the different types of respiratory protection are outlined in Attachment F.

Respirators found to be defective during the inspection shall be taken out of service or repaired, as outlined in Section 4.9.

4.7 Respirator Cleaning and Disinfecting

Respirators in regular use shall be cleaned and disinfected as often as necessary to ensure they are maintained in a clean and sanitary condition. Emergency respirators and respirators that will be transferred or used by other employees must be cleaned and disinfected after every use. Procedures for cleaning and disinfecting respirators are presented in Attachment G.

4.8 Respirator Storage

Respirators shall be properly stored to protect against contamination, dust, extreme temperatures, excessive moisture, damaging chemicals, and direct sunlight. They shall be packed or stored to prevent deformation of the facepiece and exhalation valve. Store respirators in their original carton or carrying case if possible.

Respirators stored for emergency use must be accessible to the work area. Compartments must be clearly marked indicating that emergency respirators are inside.

4.9 Respirator Repairs and Maintenance

Respirators found to be defective during inspection, user seal check, cleaning, or operation must be removed from service until repaired.

Repairs and maintenance to respirators beyond regular cleaning and other routine tasks such as replacement of worn straps, exhalation and inhalation valves, and lens covers, must be performed by an individual certified by the manufacturer. Respirator users shall notify the SSO or SS of respirators that are defective beyond routine repair. The SSO or SS shall initiate non-routine repairs by sending the respirator to a factory-certified equipment specialist. The factory-certified equipment specialist shall ensure respirators are properly repaired and inspected before reuse. Repairs not carried out by the manufacturer or by a factory-certified equipment specialist will generally void the respirator's NIOSH approval.

4.10 Respirator Breathing Air Quality and Use

Compressed breathing air used with SCBA or SAR shall meet or exceed the Compressed Gas Association requirements for Grade "D" air. Grade D air specifications include the following:

- Oxygen content of 19.5 to 23.5 percent by volume
- Condensed hydrocarbons of 5 milligrams per cubic meter (mg/m³) or less
- Carbon monoxide (CO) content of 10 ppm or less
- Carbon dioxide (CO₂) content of 1,000 ppm or less
- Lack of noticeable odor.

All breathing air couplings must be incompatible with those of non-respirable air, or other gases used at the site, to prevent inadvertent servicing of supplied-air respirators with nonrespirable gases or oxygen.

Compressed or liquid oxygen shall not be used with SCBA or SAR.

4.10.1 Breathing Air Supplied by Cylinders

The cylinder shall be marked with a NIOSH approval label.

The supplier of breathing air cylinders shall provide a certificate of analysis stating that the air meets Grade D air requirements and has a moisture content that does not exceed a dew point of – 50° F at 1 atmosphere pressure. The SSO or SS shall verify that the certificate of analysis meets Grade D air requirements and that the certificate is kept onsite.

4.10.2 Breathing Air Supplied by Compressors

The SSO or SS shall verify that compressors supplying breathing air meet the provisions listed below.

Breathing air supplied by compressors shall meet Grade D air requirements and minimize moisture content so that the dew point at 1 atmosphere pressure is 10° F below ambient temperature. Compressors shall be constructed and maintained as follows:

- The compressor intake shall be located in a manner that prevents contaminated air from entering the air-supply system. The intake shall be located away from combustion exhaust gases from nearby vehicles or the compressor itself, or by other exhaust gases ventilated from plant processes.
- The compressor shall be provided with suitable in-line air-purifying sorbent beds or filters to further ensure breathing air quality. Sorbent beds or filters shall be maintained and replaced following the compressor manufacturer's instructions.
- A tag shall be maintained on the compressor indicating the most recent sorbent bed or filter change date and the signature of the person that performed the change.

Oil-lubricated compressors shall be provided with a high-temperature or carbon monoxide alarm, or both, to monitor carbon monoxide levels. If a high-temperature alarm alone is used, the air supply shall be monitored at intervals sufficient to prevent carbon monoxide in the breathing air from exceeding 10 ppm. If a carbon monoxide alarm is used, the alarm shall be loud enough to alert the breathing air users or another person who knows to alert any users.

Non oil-lubricated compressors do not require a high-temperature or carbon monoxide alarm. However, the compressor user shall take practical measures to ensure that carbon monoxide levels in the breathing air do not exceed 10 ppm. These measures include placing the air intake for the compressor in an area that is free from contaminants, monitoring frequently or continuously for carbon monoxide in the breathing air supply, using carbon monoxide filters, or using a high temperature alarm or shut off device.

4.11 Evaluation of the Respiratory Protection Program

North Wind's respiratory protection program shall be evaluated by the SSO or SS during H&S self-assessments and by the HSD during field audits.

Appendix A provides a respiratory protection self-assessment checklist that shall be used to verify effective implementation of this Program. This checklist shall be completed by the SSO or SS at least once during projects requiring the use of respiratory protection by North Wind personnel. Any deficiencies noted during the self-assessment shall be brought to the attention of the HSD.

The SSO, in completing a health and safety field audit that requires employees to use respiratory protection, shall consult respirator users to obtain their views on the effectiveness of the written program and to identify any concerns. Factors to be assessed during the audit include the following:

- Are respirators properly fitted?
- Is respirator use interfering with effective workplace performance?
- Are appropriate respirators correctly selected for the hazards encountered?
- Are respirators being worn when necessary?
- Are respirators being used and maintained properly?

The SSO shall notify the Respiratory Protection Program Administrator (HSD) of any deficiencies noted during a health and safety audit or self-assessment, or of any complaints or concerns raised by individual employees. The Program Administrator (HSD) shall take all appropriate action to ensure the effectiveness of the respiratory protection program.

4.12 Evaluating Subcontractor's Respiratory Protection Program

Appendix H provides the minimum criteria for subcontractor respiratory protection procedures. These criteria shall be used by the HSD in reviewing submitted subcontractor procedures when North Wind subcontractors request to use their own respiratory protection program or as required by contract.

The self-assessment checklist found in Appendix A shall also be used to evaluate subcontractor compliance with their own respirator protection program. The SSO or SS shall determine the frequency in which this checklist shall be completed for subcontractor oversight.

5. RECORDS

The Health and Safety Director shall maintain the following *records* in accordance with QAP-171, Records Control:

- HSF-006.2, Fitness for Duty

6. REFERENCES

10 CFR 835, "Occupational Radiation Protection"

29 CFR 1910.134, "Respiratory Protection"

HSP-001, "Project Safety Analysis"

HSP-006, "Medical Surveillance Program"

APPENDIX A, H&S Self-Assessment Checklist–Respiratory Protection

This checklist is provided as a method of verifying compliance with the OSHA respiratory protection standard. It shall be used at locations where North Wind personnel are using respiratory protection, or are required to perform oversight of a subcontractor using respiratory protection, or both.

North Wind staff shall not direct the means and methods of subcontractor use of respiratory protection nor direct the details of corrective actions. The subcontractor must determine how to correct deficiencies and North Wind staff must carefully rely on their expertise. Items considered to be imminently dangerous (possibility of serious injury or death) must be corrected immediately or all exposed personnel must be removed from the hazard until corrected.

Completed checklists must be sent to the appropriate regional health and safety program manager for review.



H&S SELF-ASSESSMENT CHECKLIST-RESPIRATORY PROTECTION

Project Name: _____ Project No.: _____
 Location: _____ PM: _____
 Auditor: _____ Title: _____ Date: _____

This specific checklist has been completed to (check only one of the boxes below):
 Evaluate North Wind compliance with its respiratory protection program (HSP-11-007)
 Evaluate a North Wind subcontractor's compliance with its respiratory protection program
 Subcontractor's Name: _____

Check "Yes" if an assessment item is complete or correct.
 Check "No" if an item is incomplete or deficient. Section 2 must be completed for all items checked "No."
 Check "N/A" if an item is not applicable.
 Check "N/O" if an item is applicable but was not observed during the assessment.

Numbers in parentheses indicate where a description of this assessment item can be found in North Wind HSP-11-007.

PROCEDURE AREA		Yes	No	N/A	N/O
Training (4.1)					
1	Respirator users have completed appropriate training on the respirator to be used?				
2	Training is current within the past 12 months?				
3	HSP-11-007 distributed and completed by employees using respirators voluntarily?				
Medical Evaluation (4.2)					
4	Respirator users completed medical evaluation protocol?				
5	Respirator use does not exceed any physician's written recommendation limitations?				
6	Respirator users know to report any medical signs or symptoms related to respirator use?				
Fit Testing (4.3)					
7	Respirator users of tight-fitting face pieces have passed a fit test?				
8	Fit test is current within the past 12 months?				
9	Respirator users know to have new fit test performed if any change affects respirator fit?				
Respirator Selection (4.4)					
10	All feasible engineering controls have been considered in reducing exposure levels?				
11	Appropriate respiratory protection and limitations are specified in project safety analysis documentation?				
12	Cartridge or canister change-out schedule is specified in project safety analysis documentation?				
Respirator Use (4.5)					
13	Respirator use is limited to those specified in project safety analysis documentation?				
14	HSD notified of changes in site conditions that may alter effectiveness of specified respirators?				
15	Respirator users of tight-fitting face pieces are cleanly shaven (face-facepiece seal)?				
16	Respirator users of tight-fitting face pieces perform user seal check before each use?				
17	Cartridges or canisters replaced according to change-out schedule in project safety analysis documentation?				
18	Respirator users informed to report any gas or vapor breakthrough to SSO/SS?				
19	SSO/SS knows to report any gas or vapor breakthrough to HSD?				
20	Personnel not entering IDLH areas until standby-person established with appropriate equipment?				
Respirator Inspection (4.6)					

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APPENDIX B, Qualitative and Quantitative Fit Testing Protocols

The following protocols are provided to assist individuals conducting respirator fit tests. Only individuals trained in fit testing protocols (fit testers) shall be permitted to perform respirator fit testing. Individuals being fit tested (test subjects) shall follow all instructions provided by the fit tester. These protocols are mandated by the Occupational Safety and Health Administration Respiratory Protection standard (29 CR 1910.134, Appendix A) and any deviation shall void test results.

1.1. General Requirements

Respirator fit testing is required for tight-fitting respirator face pieces and must be done as follows:

- Before initial respirator use
- Annually
- When there are changes in an employee's physical condition that could affect the fit of the facepiece (that is, facial scarring, cosmetic surgery, dental changes, or an obvious change in body weight)
- When the facepiece to be worn is different in size, style or model, than the facepiece used during a fit test
- After passing a fit test, an employee determines the facepiece fit to be unacceptable.

Fit testing is not required for the use of a filtering facepiece respirator (dust mask). The fit tester shall verify that a medical evaluation has been conducted and a written recommendation has been received from the consulting physician. Fit testing shall only be performed for respirators the consulting physician has approved for use.

A qualitative fit test (QLFT) may be used for all positive pressure respirators and for negative pressure air-purifying respirators (APR) that must have a protection factor of 10 or less. Positive pressure respirators shall be fit tested in the negative pressure mode.

A quantitative fit test (QNFT) shall be used for supplied-air respirators (SAR) and self-contained breathing apparatus (SCBA) used in negative pressure mode (demand mode) and full-face APR which require a protection factor greater than 10.

1.2 Choosing a Respirator

- Provide a sufficient number of respirator models and sizes to allow the test subject to pick a respirator that is comfortable and fits correctly. The fit test shall be conducted using the same size, style, and model of respirator facepiece that will be used in the field by the test subject.

- Instruct the test subject on how to put on a respirator, how it should be positioned on the face, how to set strap tension, and how to determine an acceptable fit. A mirror shall be available to assist the test subject in evaluating the fit and positioning of the respirator.
- Inform the test subject that he or she is being asked to select the respirator that provides the most acceptable fit. Each respirator represents a different size and shape, and if fitted and used properly, will provide adequate protection.
- Instruct the test subject to hold each chosen facepiece up to the face and eliminate those that obviously do not give an acceptable fit.
- The more acceptable face pieces shall be noted in case the one selected proves unacceptable; the most comfortable mask shall be donned and worn at least five minutes to assess comfort.
- Assistance in assessing comfort can be given by discussing the points in item 6 (below). If the test subject is not familiar with using a particular respirator, the test subject shall don the mask several times and adjust the straps each time to become adept at setting proper tension on the straps.
- Assessment of comfort shall include a review of the following points with the test subject, and allowing the test subject adequate time to determine the comfort of the respirator:
 - Position of the mask on the nose
 - Room for eye protection
 - Room to talk
 - Position of mask on face and cheeks
- The following criteria shall be used to help determine the adequacy of the respirator fit:
 - Chin properly placed
 - Adequate strap tension, not overly tightened
 - Fit across nose bridge
 - Respirator of proper size to span distance from nose to chin
 - Tendency of respirator to slip
 - Self-observation in mirror to evaluate fit and respirator position
- A fit test shall not be conducted if there is any hair growth between the skin and the facepiece sealing surface, such as stubble beard growth, beard, mustache or sideburns which cross the respirator sealing surface. Any type of apparel which interferes with a satisfactory fit shall be altered or removed.

- If a test subject exhibits difficulty in breathing during the tests, they shall be referred to the consulting physician, to determine whether this test subject can wear a respirator while performing their duties.
- If the test subject finds the fit of the respirator unacceptable, they shall be given the opportunity to select a different respirator and to be re-tested.
- Prior to the fit test, the test subject shall be given a description of the fit test and their responsibilities during the test protocol. The description of the process shall include a description of the test exercises that the test subject will be performing. The respirator to be tested shall be worn for at least 5 minutes before the start of the fit test.
- The fit test shall be performed while the test subject is wearing any applicable safety equipment that may be worn during actual respirator use which could interfere with respirator fit.

1.3 Test Exercises

Each of the following test exercises shall be performed for one minute except for the grimace exercise which shall be performed for 15 seconds. Question the test subject with regard to the comfort of the respirator upon completion of the test exercises.

- Normal Breathing. In a normal standing position, without talking, the subject shall breathe normally.
- Deep breathing. In a normal standing position, the subject shall breathe slowly and deeply, taking caution so as not to hyperventilate.
- Turning head side to side. Standing in place, the subject shall slowly turn their head from side to side between the extreme positions on each side. The head shall be held at each extreme momentarily so the subject can inhale at each side.
- Moving head up and down. Standing in place, the subject shall slowly move their head up and down. The subject shall be instructed to inhale in the up position (that is, when looking toward the ceiling).
- Talking. The test subject shall read the following passage slowly and loudly enough so as to be heard clearly by the fir tester: “When the sunlight strikes raindrops in the air, they act like a prism and form a rainbow. The rainbow is a division of white light into many beautiful colors. These take the shape of a long round arch, with its path high above, and its two ends apparently beyond the horizon. There is, according to legend, a boiling pot of gold at one end. People look, but no one ever finds it. When a man looks for something beyond reach, his friends say he is looking for the pot of gold at the end of the rainbow.”
- Grimace. The test subject shall grimace by smiling or frowning. (This applies only to QNFT testing, it is not performed for QLFT)

- Bending over. The test subject shall bend at the waist as if they were to touch their toes. Jogging in place shall be substituted for this exercise in those test environments such as shroud type QNFT or QLFT units that do not permit bending over at the waist.
- Normal breathing. Same as exercise 1.

1.4 Isoamyl Acetate Qualitative Fit Test (QLFT) Protocol

1.4.1 Isoamyl Acetate Odor Threshold Screening

Odor threshold screening, performed without wearing a respirator, is intended to determine if the test subject can detect the odor of isoamyl acetate (IAA), also known as isopentyl acetate, at low levels.

- Three 1 liter glass jars with metal lids are required.
- Odor-free water (distilled or spring water) shall be used for the solutions.
- The mixtures used in the IAA odor detection test shall be prepared in an area separate from where the screening test is performed, in order to prevent olfactory fatigue in the subject.
- The screening test shall be conducted in a room separate from the room used for actual fit testing. The two rooms shall be well-ventilated to prevent the odor of IAA from becoming evident in the general room air where testing takes place.
- Prepare a stock solution of IAA by adding 1 milliliter (ml) of pure IAA to 800 ml of odor-free water in a 1 liter jar, closing the lid and shaking for 30 seconds. A new solution shall be prepared at least weekly.
- Prepare an odor test solution in a second jar by placing 0.4 ml of the stock solution into 500 ml of odor-free water using a clean dropper or pipette. The solution shall be shaken for 30 seconds and allowed to stand for two to three minutes so that the IAA concentration above the liquid may reach equilibrium. This solution shall be used for only one day.
- Prepare a test blank in a third jar by adding 500 ml of odor-free water.
- Label the odor test and test blank jar lids for jar identification (1 and 2). Labels shall be placed on the lids so that they can be peeled off periodically and switched to maintain the integrity of the test.
- Place the following instructions on the table in front of the two test jars:
 - “The purpose of this test is to determine if you can smell banana oil at a low concentration. The two bottles in front of you contain water. One of these bottles also contains a small amount of banana oil. Be sure the covers are on tight, then shake each bottle for two seconds.
 - Unscrew the lid of each bottle, one at a time, and sniff at the mouth of the bottle. Indicate to the fit tester which bottle contains banana oil.”

- If the test subject is unable to correctly identify the jar containing the odor test solution, the IAA qualitative fit test shall not be performed.
- If the test subject correctly identifies the jar containing the odor test solution, the test subject may proceed to IAA fit testing.

1.4.2 Isoamyl Acetate Fit Test

- The fit test chamber shall be a clear 55-gallon drum liner suspended inverted over a 2-foot diameter frame so that the top of the chamber is about 6 inches above the test subject's head. If no drum liner is available, a similar chamber shall be constructed using plastic sheeting. The inside top center of the chamber shall have a small hook attached.
- Verify that each respirator used for the fitting and fit testing is equipped with organic vapor cartridges.
- After the test subject has donned and properly adjusted the respirator, instruct the test subject to perform a user seal check, as described in Attachment 5 of the North Winds's Respiratory Protection Program (ESH-007). If a user seal check cannot be passed a different respirator size or model shall be tried. If it fit becomes unacceptable, another model of respirator shall be tried. The respirator shall not be adjusted once the fit test exercises begin. Any adjustment voids the test, and the fit test must be repeated.
- Upon entering the test chamber, the test subject shall be given a 6-inch by 5-inch piece of paper towel, or other porous, absorbent, single-ply material, folded in half and wetted with 0.75 ml of pure IAA. Instruct the test subject to hang the wet towel on the hook at the top of the chamber. An IAA test swab or ampule may be substituted for the paper towel provided it has been demonstrated that the alternative IAA source will generate an IAA test atmosphere with a concentration equivalent to that generated by the paper towel method.
- Allow two minutes for the IAA test concentration to stabilize before starting the fit test exercises. This would be an appropriate time to talk with the test subject; to explain the fit test, the importance of their cooperation, and the purpose for the test exercises; or to demonstrate some of the exercises.
- Instruct the test subject to perform the test exercises as identified in Section 3.0 of this Attachment. A copy of the test exercises shall be provided or taped to the inside of the test chamber.
- If at any time during the test, the test subject detects the banana-like odor of IAA, the test is failed. The test subject shall quickly exit from the test chamber and leave the test area to avoid olfactory fatigue.
- If the test is failed, the test subject shall return to the selection room and remove the respirator. The test subject shall repeat the odor sensitivity test, select and put on another respirator, return to the test area and again begin the fit test protocol (1) through (7) above. The process continues until a respirator that fits well has been found. Should the test subject fail the odor sensitivity test, they shall wait at least 5 minutes before retesting. Odor sensitivity will usually have returned by this time.

- If the test subject passes the test, the efficiency of the test protocol shall be demonstrated by having the test subject break the respirator face seal and take a breath before exiting the chamber.
- Instruct the test subject to remove the saturated towel so that there is no significant IAA concentration buildup in the chamber during subsequent tests. The used towels shall be kept in a self-sealed plastic bag to keep the test area from being contaminated.
- Complete the Qualitative Respirator Fit Test Worksheet, provided at the end of this attachment, and send to the North Wind Human Resources Administrator for retention.

1.5 Irritant Smoke (Stannic Chloride) Qualitative Fit Test (QLFT) Protocol

1.5.1 General Requirements and Precautions

- Verify the respirator to be tested is equipped with high efficiency particulate air (HEPA) or P100 series filter(s).
- Only stannic chloride smoke tubes shall be used for this protocol.
- No form of test enclosure or hood for the test subject shall be used.
- The smoke can be irritating to the eyes, lungs, and nasal passages. Take precautions to minimize the test subject's exposure to irritant smoke. Sensitivity varies, and certain individuals may respond to a greater degree to irritant smoke. When performing the sensitivity screening checks that determine whether the test subject can detect irritant smoke, care shall be taken to use only the minimum amount of smoke necessary to elicit a response from the test subject.
- The fit test shall be performed in an area with adequate ventilation to prevent exposure of the fit tester or the build-up of irritant smoke in the general atmosphere.

1.5.2 Irritant Smoke Sensitivity Screening Check

The test subject must demonstrate their ability to detect a weak concentration of the irritant smoke.

- Break both ends of a ventilation smoke tube containing stannic chloride, and attach one end of the smoke tube to a low flow air pump set to deliver 200 milliliters per minute, or an aspirator squeeze bulb. Cover the other end of the smoke tube with a short piece of tubing to prevent potential injury from the jagged end of the smoke tube.
- Advise the test subject that the smoke can be irritating to the eyes, lungs, and nasal passages and instruct the test subject to keep his or her eyes closed while the test is performed.
- The test subject shall be allowed to smell a weak concentration of the irritant smoke before the respirator is donned to become familiar with its irritating properties and to determine if they can detect the irritating properties of the smoke. Carefully direct a small amount of the irritant smoke in the test subject's direction to determine that he or she can detect it. If the test subject is unable of detecting the irritant smoke, this fit test protocol may not be used

1.5.3 Irritant Smoke Fit Test Protocol

- After the test subject has donned and properly adjusted the respirator, instruct the test subject to perform a user seal check, as described in Attachment 5 of North Wind's Respiratory Protection

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Program (ESH-007). If a user seal check cannot be passed, a different respirator size or model shall be tried. If it fit becomes unacceptable, another model of respirator shall be tried. The respirator shall not be adjusted once the fit test exercises begin. Any adjustment voids the test, and the fit test must be repeated.

- Instruct the test subject to keep his or her eyes closed.
- Direct the stream of irritant smoke from the smoke tube toward the face seal area of the test subject, using the low flow pump or the squeeze bulb. Begin at least 12 inches from the facepiece and move the smoke stream around the whole perimeter of the mask. Gradually make two more passes around the perimeter of the mask, moving to within six inches of the respirator.
- If the test subject has not had an involuntary response or detected the irritant smoke, proceed with the test exercises. Instead of having the test subject read the “rainbow passage” in step 5, instruct the test subject to talk for 1 minute.
- Instruct the test subject to perform the test exercises identified in Section 3.0 of this attachment while the respirator seal is being continually challenged by the smoke, directed around the perimeter of the respirator at a distance of six inches.
- If the test subject detects the irritant smoke at any time, the test is failed. Test subjects being retested must repeat the entire sensitivity check and fit test protocol.
- Each test subject passing the irritant smoke test without evidence of a response (involuntary cough, irritation) shall be given a second sensitivity screening check, with the smoke from the same smoke tube used during the fit test once the respirator has been removed, to determine whether he or she still reacts to the smoke. Failure to evoke a response shall void the fit test.
- If a response is produced during this second sensitivity check, then the fit test is passed.
- Complete the Qualitative Respirator Fit Test Worksheet or equivalent, provided at the end of this attachment, and send to the North Wind Human Resources Administrator for retention.

1.6 Portacount Quantitative Fit Test (QNFT) Protocol

- A probed respirator is required for each make, style, model, and size that the test subject may use.
- Check the respirator to make sure the sampling probe and line are properly attached to the facepiece and that the respirator is fitted with a high efficiency particulate air (HEPA) or P100 series filter(s).
- Instruct the test subject to don the respirator for five minutes before the fit test starts. This purges the ambient particles trapped inside the respirator and permits the test subject to make certain the respirator is comfortable.
- Check the following conditions for the adequacy of the respirator fit: chin properly placed; adequate strap tension, not overly tightened; fit across nose bridge; respirator of proper size to span distance from nose to chin; tendency of the respirator to slip; and self-observation in a mirror to evaluate fit and respirator position.

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- Instruct the test subject to perform a user seal check, as described in Attachment 5 of North Wind's Respiratory Protection Program (ESH-007). If a user seal check cannot be passed, a different respirator size or model shall be tried. If its fit becomes unacceptable, another model of respirator shall be tried. The respirator shall not be adjusted once the fit test exercises begin. Any adjustment voids the test, and the fit test must be repeated.
- Follow the Portacount operating instructions as presented in the Portacount training and proceed with the test.
- Instruct the test subject to perform the test exercises in Section 3.0 of this attachment.
- After the test exercises, question the test subject regarding the comfort of the respirator. If the fit has become unacceptable, another model of respirator shall be tried.
- The Portacount will automatically stop and calculate the overall fit factor for the entire set of exercises. The overall fit factor is what determines the success of the fit test. The Pass or Fail message will indicate whether or not the test was successful. If the test was a Pass, the fit test is over.
- Since the pass or fail criteria of the Portacount are user programmable, verify that the pass or fail criteria meet the requirements for minimum respirator performance. A minimum fit factor pass level of at least 100 is necessary for a half-face respirator and a minimum fit factor pass level of at least 500 is required for a full-face respirator.
- Print a record of the fit test or equivalent and send to the North Wind Human Resources Administrator for retention.

APPENDIX C, Respirator Selection Guideline

The selection of appropriate respiratory protection for field activities is a complex process that must be based on numerous variables. The information in this guideline is provided to assist the HSD in selecting appropriate respiratory protection.

1. General Selection Procedure

The following steps shall be taken by the HSD in selecting appropriate respiratory protection:

- Identify hazardous airborne contaminants
- Estimate exposure levels
- Consider workplace and user factors
- Select appropriate respiratory protection

2. Identifying Hazardous Airborne Contaminants

The HSD shall use all available information in identifying potential hazardous airborne contaminants. This includes using the information provided in the project safety analysis documentation and discussing the site conditions with the project manager and SSO or SS. The HSD shall also determine the contaminants physical form and chemical state. The physical form refers to whether the air contaminant is a gas, vapor, mist, fume, dust, fiber, biological hazard, radiological hazard, or some combination. The physical form may dictate which filter element will offer adequate protection. The chemical state refers to the contaminants valence state. For example, chromium must be identified by its valence state (chemical compound) since chromium VI compounds have much lower exposure limits than chromium metal, chromium II or chromium III compounds.

3. Estimate Exposure Levels

Once the potential airborne contaminants and nature of the hazards have been identified, the HSM shall evaluate the magnitude of the hazards by determining the potential exposure levels. A reasonable estimate of exposure shall be made using one or more of the following methods:

- Personal air sampling—the respiratory protection standard does not explicitly required air sampling, but this is the most reliable and accurate method of determining exposure levels. Some OSHA substance-specific standards require air sampling.
- Area sampling or short duration sampling—a reasonable estimate of exposure may be determined using these methods; however, measurements must be taken during worst-case conditions
- Objective data—objective data may include previous exposure measurements, data obtained from industry studies, trade associations, or from product manufacturers. The objective data must represent the highest exposure likely to occur under reasonably foreseeable conditions. To make estimates from objective data, the measurements must have been taken from conditions that are similar to those in the workplace

- Mathematical modeling—data from the physical and chemical properties of the contaminant combined with room (workplace) dimensions, air exchange rates, release rates, exposure patterns, work practice, and other pertinent data may be used to estimate the maximum anticipated exposure levels. This method should be limited to situations where the workplace factors such as contaminant release rates are fairly constant or predictable.

Since site conditions and exposure levels can vary from day to day, the HSD shall take a conservative approach when estimating exposure levels and shall incorporate an additional safety factor. The SSO or SS is responsible for routinely evaluating respirator use and notifying the HSD of any change from the expected site conditions that may alter the effectiveness (performance and reliability) of the selected respiratory protection. The HSD shall make necessary corrections to the selection based on this information.

4. Workplace and User Factors

The HSM shall also consider the following workplace and user factors when determining specific respiratory protection effectiveness:

- Size and configuration of the workplace—are employees able to work in tight or enclosed areas with the required respiratory protection
- Worker communication—will the respiratory protection limit the ability of users to communicate with one another, as necessary
- Work rate of the activity—will a heavy work rate deplete air supply quickly; will a combination of respiratory protection and work rate cause stressful conditions; are more comfortable respirators appropriate for long duration use
- Temperature and humidity—will environmental conditions affect filter elements or cause stressful conditions for users of certain respiratory protection
- Workplace conditions and location—will mobility be limited; is moving machinery posing entanglement hazards to breathing air supply lines.

5. Select Appropriate Respiratory Protection

Only NIOSH-certified respiratory protection shall be selected and shall be used within the limitations of the certification.

OSHA substance-specific standards have specific requirements for using respiratory protection. Refer to individual Procedures for these requirements. The substance-specific requirements supersede the general requirements of this Program. For example, only atmospheric-supplied respirators are permitted for protection against methylene chloride.

Atmospheres that are not or cannot be reasonably estimated must be treated as IDLH environments.

6.1 Protection Factors

OSHA did not provide protection factors in the new respiratory protection standard; however, OSHA has stated that the protection factors established by NIOSH shall be used when substance-specific standards do not provide such information.

The following NIOSH protection factors (PF) shall be used for the listed respiratory protection:

PF	Respiratory Protection
10	Half-face air-purifying respirator (APR)
50	Full-face APR* and powered air-purifying respirator (PAPR)
1,000	Half-face pressure demand supplied-air respirator (SAR)
2,000	Full-face pressure demand SAR
10,000	Pressure demand self-contained breathing apparatus (SCBA)
10,000	Pressure demand SAR in combination with an auxiliary pressure demand SCBA

Note: Individuals using full-face APRs in which they have only received a qualitative fit test (QLFT), may only take a PF of 10.

6.2 Respiratory Protection for Gas and Vapor Atmospheres

The following respirators shall be used for protection against gases and vapors:

- Atmosphere-supplying respirator OR APR with one of the following:
 - 1 A cartridge and canister end-of-service-life indicator (ESLI) certified by NIOSH for the contaminant
 - 2 A schedule for cartridge and canister change-out
 - 3 If an APR without an ESLI will be used, the HSD shall develop a cartridge and canister change-out schedule using the guidelines provided in Appendix D.

6.3 Respiratory Protection for Particulate Atmospheres

One of the following respirators shall be used for protection against particulates:

- An atmosphere-supplying respirator
- An APR equipped with one of the following:
 - A NIOSH-certified high efficiency particulate air (HEPA) filter or NIOSH-certified particulate filter (filter series N, R, and P)
 - Any NIOSH-certified particulate filter if the particles have mass median aerodynamic diameters (MMAD) of at least 2 micrometers (filter series DM and DFM).

If an OSHA substance-specific standard specifically requires a HEPA filter, the only allowable filters are a NIOSH-certified HEPA filters or filter series N100, R100, and P100.

When oil aerosols are present in the atmosphere, the preferred filter is a filter series “P” (Oil Proof) which may be used for more than one work shift. Filter series “R” (Oil Resistant) may be used for

only one work shift and filter series “N” (Non-Oil Resistant) shall not to be used in atmospheres containing oil aerosols.

6.4 Respiratory Protection for IDLH atmospheres

One of the following respirators shall be used for protection in IDLH atmospheres:

- Combination full facepiece pressure demand SAR with auxiliary self-contained air supply
- Full facepiece pressure demand SCBA certified by NIOSH for a minimum service life of thirty minutes.

Respirators provided for escape from IDLH atmospheres only, shall be NIOSH-certified for escape from the atmosphere in which they will be used.

6.5 Other Considerations

Eye and face irritants. Some contaminants may irritate the eyes and face or have an exposure pathway through the eyes. For these contaminants only full-face respiratory protection shall be used.

PAPR requirement. Some substance-specific standards (asbestos, arsenic, benzene, cadmium, lead, etc.) allow employees to choose a PAPR over an APR when a PAPR offers adequate protection.

Medical evaluation limitations. The consulting physician’s written recommendation may limit the type of respiratory protection an employee can use.

APPENDIX D, Cartridge or Canister Change-Out Schedules

1 General

The OSHA Respiratory Protection standard (29 CFR 1910.134) requires that a cartridge or canister change-out schedule be established and implemented when air-purifying respirators (APR) without cartridge or canister end-of-service-life indicators (ESLI) appropriate for the workplace conditions are used for protection against gases and vapors. Since NIOSH currently has approved ESLI for only four cartridges or canisters (mercury vapor, carbon monoxide, ethylene oxide, and hydrogen sulfide), a change-out schedule will probably be required for APR use against gases and vapors. The following guidelines are provided to assist the HSD in developing change-out schedules.

2 Objective

The objective of the change-out schedule is to ensure that APRs are not used in situations where a chemical cartridge or canister becomes saturated such that the gas or vapor contaminant can “breakthrough” the filter’s sorbent element and enter the respirator.

2.1 Warning Properties

The new standard prohibits the use of warning properties as the sole basis for determining change-out schedules. However, respirator users have been trained to understand that abnormal odor or irritation is evidence that respirator cartridges and canisters need to be replaced and to inform the SSO or SS of such an occurrence. The SSO or SS is required to contact the HSD to discuss changes to the schedule. Where an effective change-out schedule is implemented, APR respirators may be used for gases and vapors having few or no warning properties.

2.2 Factors Influencing Cartridge or Canister Service Life

The following is a partial list of the factors that can influence the service life of a cartridge or canister, followed by established “rules of thumb”:

- Contaminant's chemical properties—for chemicals with boiling points greater than 70° C and a concentration less than 200 ppm, a service life of 8 hours at normal work rate can be expected (OSHA has not approved this rule and therefore, should not be used as the primary determining factor).
- Contaminants concentration—reducing the concentration by a factor of 10 increases service life by factor of 5.
- Temperature—high temperatures can directly affect the performance of the activated carbon filters.
- Humidity—humidity greater than 85 percent, reduces service life by 50 percent.
- Work rate (breathing rate) of the respirator user—service life is inversely proportional to work rate
- Variability of respirator cartridges between manufacturers
- Presence of multiple contaminants—see change-out schedule for mixtures in Section 7.2

3 OSHA Substance-Specific Change-Out Schedules

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OSHA has already developed change-out schedules in the following substance-specific standards:

Contaminant	Standard Reference	Change-Out Schedule
Acrylonitrile	1910.1045(h)(2)(ii)	End-of-service life or end of shift (whichever occurs first)
Benzene	1910.1028(g)(2)(ii)	End-of-service life or end of shift (whichever occurs first)
Butadiene	1910.1051(h)(2)(ii)	After 4 hours for concentrations up to 5 ppm, After 3 hours for concentrations between 5 and 10 ppm, After 2 hours for concentrations between 10 and 25 ppm, After 1 hour for concentrations up to 50 ppm.
Formaldehyde	1910.1048(g)(2)(ii)	Cartridges: end-of-service life or after 3 hours (whichever occurs first) Canisters: end-of-service life or after 4 hours for concentrations up to 7.5 ppm (whichever occurs first) Industrial Canisters: end-of-service life or after 2 hours for concentrations up to 75 ppm (whichever occurs first)
Vinyl Chloride	1910.1017(g)(3)(ii)	End-of-service life or end of shift (whichever occurs first)
Methylene Chloride	1910.1052(g)(2)(ii)	Canisters may only be used for emergency escape and must be replaced after use

4. Developing Change-Out Schedules

Development of the change-out schedule must be based on reliable information on the service life of the cartridge or canister. Such information may include breakthrough test data or use recommendations from respirator manufacturers or chemical suppliers.

4.1 Breakthrough Test Data

The HSD shall determine if there is objective breakthrough test data available for the make and model of respirator cartridge or canister to be used and whether the test data is sufficient to develop the change-out schedule. Sources of breakthrough test data include:

- Respiratory manufacturers objective data—see MSA Web site at (<http://www.msanet.com/safetyproducts/resptest/index.html>)
- Experimental breakthrough-time data from industry organizations, trade associations, professional societies, academic institutes, and laboratory tests
- Mathematical predictive modeling—complex calculations requiring proprietary information from cartridge manufacturer (not likely to present acceptable results).

Since numerous influencing factors (Section 4.0) must be considered, the HSD shall take a conservative approach in developing change-out schedules by basing the schedule on worst-case conditions found in the workplace. To the extent that change schedules are based on breakthrough

test data that were not obtained under similar worst-case conditions, the HSM shall provide an additional margin of safety to ensure that breakthrough is not likely to occur during respirator use.

4.1 Recommendations from Respiratory Manufacturers

If breakthrough data are not available, the HSM shall seek other information on which to base a reliable cartridge or canister change-out schedule. The most readily available alternative is to rely on recommendations of the respirator manufacturer. To be reliable, such recommendations shall consider workplace-specific influencing factors (Section 2.2) that are likely to affect cartridge or canister service life.

5 Other Considerations

5.1 Analogous Chemical Structures

When breakthrough test data or other information are not available for the contaminant under evaluation, the HSD may rely on service life values from other chemicals having analogous chemical structures. In some cases a chemical with known migration may reasonably be anticipated to act as a surrogate for a similar chemical that would have less rapid migration. The HSD could assume that a heavier, less volatile compound than another in the same chemical series that had been tested for breakthrough would breakthrough no faster than the latter compound, such as benzene versus toluene. This method may be used as long as objective data or information for lower molecular weight compounds is used to predict the breakthrough times for higher molecular weight analogues containing only additional methyl or phenyl groups. Data from higher molecular weight groups should not be used to predict the behavior of analogous substances with lower molecular weight. This approach relies heavily on experimental data and expert analysis. This method may be less accurate than others and should be used only when better information is not available.

5.2 Change-Out Schedules for Multiple Contaminants (Mixtures)

Establishing cartridge or canister service life for mixtures of contaminants is a complex task and one that requires considerable professional judgment to create a reasonable change-out schedule.

The change-out schedule for a mixture should be based on reasonable assumptions that include a margin of safety. Where the individual compounds in the mixture have similar breakthrough times (within one order of magnitude), service life of the cartridge should be established assuming the mixture stream behaves as a pure system of the most rapidly migrating component or compound with the shortest breakthrough time (sum up the concentration of the components). Where the individual compounds in the mixture vary by 2 orders of magnitude or greater, the service life may be based on the contaminant with the shortest breakthrough time.

5.3 Chemical Contaminant Migration

Some contaminants have a tendency to migrate through cartridge or canister sorbent material during periods of storage or non-use. This is characteristic of the contaminant-carbon bed interaction for organic chemicals with boiling points below 65° C and would predictably shorten breakthrough times. In cases where respirators are used for multiple days, this could present an additional exposure to the respirator user. Where contaminant migration is possible, respirator cartridges or canisters should be changed after every work shift where exposure occurs unless

specific objective data to the contrary (desorption studies) shows the performance of the cartridge in the conditions and schedule of use and non-use found in the workplace.

6 Implementing the Change-Out Schedule

The HSD shall provide the change-out schedule and document the information relied upon (summary of objective data or recommendations) for establishing the schedule in the personal protective equipment section of the site-specific written plan or other project safety analysis documentation.

Since actual site conditions may differ or change from the criteria used to develop the schedule, the HSD shall also include the assumptions made regarding the influencing factors (Section 2.2). This will allow the SSO or SS to determine when the schedule may need to be revised. The HSD may choose to include alternatives to the schedule based on changing conditions (that is, change-out every 4 hours for concentrations up to 100 ppm, 2 hours for 200 ppm).

Respirator users shall be instructed to strictly follow the requirements of the change-out schedule and to report any gas or vapor breakthrough.

APPENDIX E, Respirator User Seal Check Procedure

Individuals who use tight-fitting respirator face pieces are required to perform a user seal check each time the respirator facepiece is put on to ensure that an adequate seal is achieved. Either the positive or negative pressure checks listed below may be used.

Positive Pressure Check

Close off the exhalation valve and exhale gently into the facepiece. The face fit is considered satisfactory if you can build up a slight positive pressure inside the facepiece without any evidence of outward leakage of air at the seal. For most respirators this method of leak testing requires you to first remove the exhalation valve cover before closing off the exhalation valve and then carefully replacing it after the test.

Negative Pressure Check

Close off the inlet opening of the canister or cartridge(s) by covering it (them) with the palm of the hand(s) or by replacing the filter seal(s), inhale gently so that the facepiece collapses slightly, and hold your breath for ten seconds. If the design of the inlet opening of some cartridges cannot be effectively covered with the palm of your hand, the test can be performed by covering the inlet opening of the cartridge with a thin latex or nitrile glove. If the facepiece remains in its slightly collapsed condition and you detect no inward leakage of air, the tightness of the respirator is satisfactory.

APPENDIX F, Respirator Inspection Procedures

Respirators in regular use shall be inspected by the wearer before each use and during respirator cleaning. The inspection shall include an examination of all respirator components for obvious damage or defects and a check of all rubber components for pliability and signs of deterioration.

Respirators found to be damaged or defective during the inspection shall be taken out of service or repaired, as outlined in Section 4.9 of the North Wind Respiratory Protection Program (HSP-007).

The following instructions are provided as minimum inspection criteria. Respirator manufacturer's guidelines shall be followed when they provide more specific inspection criteria.

1 Tight-Fitting Respirator Facepiece

1.1 Facepiece

- Excessive dirt, paint, grime or other material that would interfere with face seal or respirator operation
- Cracks, tears, holes, rough edges, excessive wear, or physical deformity
- Inflexibility of rubber components and signs of deterioration
- Head straps or head harness, inspect for the following:
 - Cuts, warping, or other damage
 - Loss of elasticity or excessive wear
 - Broken or malfunctioning buckles and attachments
- Lens (full-facepiece), inspect for the following:
 - Cracked, warped, or badly scratched lenses
 - Incorrect mounting, broken or missing retaining clips or clamps
- Inhalation and exhalation valves, inspect for the following:
 - Foreign material such as detergent residue, dirt, or hair under the valve seat
 - Cracks, tears, or distortion in the valve material
 - Cracks, breaks, or chips in the facepiece valve body
 - Improper seating of the valve to the valve sealing surface
 - Improper installation of the valve
 - Missing or defective valve cover

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- Speaking diaphragm
- Verify that the speaking diaphragm retainer ring is hand tight

2 Loose-Fitting Respirators

2.1 Hoods, helmet, blouse, or full suit respirators shall be inspected for the following:

- Tears, holes, and seam integrity
- Cracks, breaks, or impaired vision to face shield
- Air-Purifying Respirators (APR)
- Air-purifying elements and connections, inspect for the following:
 - Cracked or broken air-purifying element holder(s), or badly worn threads
 - Missing or damaged gasket(s)
 - Loose connections or cross threading
 - Incorrect cartridge or canister for the hazard (This information is provided in the HSP or THA)
 - Expired shelf life of cartridge or canister
 - Cracks or dents to cartridge or canister

3 Powered Air-Purifying Respirators (PAPR)

3.1 Air-purifying elements and connections

- Follow inspection criteria covered in APR above

3.2 Breathing tube and connections, inspect for the following:

- Missing or deteriorated gaskets and O-rings
- Missing or loose hose clamps
- Loose connections or worn threads
- Cracks, holes, or deterioration of breathing tube (stretch out while inspecting)

3.3 Battery Check

- Connect the PAPR battery to the charger to check that the battery is fully charged. If not fully charged, recharge the battery in a non-explosive atmosphere.

3.4 Flow Check

- With a cartridge installed in the filter assembly, turn the respirator on and check for operation. Place the facepiece into contact with your chin. A steady flow of air should fill the facepiece creating a slight positive pressure.

4 Supplied-Air Respirator (SAR)

4.1 Air Supply Lines

- Missing or deteriorated gaskets and O-rings
- Missing or loose hose clamps
- Loose connections or worn threads
- Cracks, holes, or deterioration of hoses
- Correct operation and condition of regulators, valves and other air-flow regulators

5 Self-contained breathing apparatus (SCBA)

SCBAs for emergency use only shall be inspected monthly. Documentation of the monthly inspection shall **be kept with the SCBA.**

5.1 Straps and Buckles

- Visually inspect for complete set of straps and for frayed or damaged straps that may break during use. Be sure that the screws holding straps together are present.
- Visually inspect mating ends of buckle and check locking function.

5.2 Cylinder and Backplate

- Remove the cylinder and visually inspect the backplate for cracks and missing rivets or screws.
- Verify that the cylinder is charged to at least 90 percent of full pressure. If below 90 percent, have the cylinder recharged.
- Visually determine that the cylinder valve lock is present and inspect the cylinder gauge for condition of its face, needle, and lens.
- Verify that the hydrostatic test date is current and inspect the cylinder for large dents or gouges in metal.
- Engage the cylinder lock and check that the cylinder is tightly fastened to the backplate.
- Check that the high pressure hose connector is tightly secured on the cylinder fitting.
- Cylinder Head and Valve Assembly
- Check that the high pressure hose connector is tightly secured on the cylinder fitting.
- Check that the mainline and bypass valves close properly. Close the valves.
- Make sure the regulator outlet is not covered or obstructed.
- Open the cylinder valve and listen or feel for leakage around the packing. (If leakage is noted, do not use the SCBA until it is repaired.) Check for proper functioning of the valve lock.

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5.3 High Pressure Hose and Connector

- Listen or feel for leakage in the hose (air line) or at hose-to-cylinder connector. (A bubble in the outer hose covering may be caused by seepage of air through the hose when stored under pressure. This does not necessarily indicate a faulty hose.)

5.4 Regulator and Low Pressure Alarm

- Cover the outlet of the regulator with the palm of your hand. Open the mainline valve and read the regulator gauge; it should agree with the cylinder gauge.
- Close the cylinder valve and slowly move your hand from the regulator outlet to allow a slow flow of air. A low pressure alarm should sound when the pressure falls to about 550 psi.
- Place your mouth on or over regulator outlet and blow lightly. A positive pressure should be created and maintained for 5 to 10 seconds without any loss of air. Next suck the regulator to create a slightly negative pressure and hold it for 5 to 10 seconds. Vacuum should remain constant. This tests the integrity of the diaphragm. Any loss of pressure or vacuum during this test indicates a leak that must be repaired.
- Open the cylinder valve.
- Place your hand over the regulator outlet and open the mainline valve. Remove your hand from the outlet and rapidly replace it again. Repeat this twice. Air should escape when your hand is removed each time, indicating a positive pressure in the chamber. Close the mainline valve and remove your hand from the outlet.
- Verify that no obstruction is in or over the regulator outlet. Open and close the bypass valve momentarily to assure that there is a flow of air through the bypass system.

5.5 Breathing tube and connections

- Stretch the breathing tube and inspect for cracks, holes, or deterioration.
- Inspect the connector to determine the condition of its threads and for presence and proper condition of the O-ring or rubber gasket.

APPENDIX G, Respirator Cleaning and Disinfecting Procedures

(Reference 29 CFR 1910.134, Appendix B-2 *Respirator Cleaning Procedures*)

- Remove filters, cartridges, or canisters. Disassemble face pieces by removing speaking diaphragms, demand and pressure-demand valve assemblies, hoses, or any components recommended by the manufacturer. Discard or repair any defective parts.
- Wash components in warm (110° F maximum) water with a mild detergent or with a cleaner recommended by the manufacturer. A stiff bristle (not wire) brush may be used to facilitate the removal of dirt.
- Rinse components thoroughly in clean, warm (110° F maximum), preferably running water. Drain.
- When the cleaner used does not contain a disinfecting agent, respirator components should be immersed for two minutes in one of the following:
 - Hypochlorite solution (50 ppm of chlorine) made by adding approximately one milliliter of laundry bleach to one liter of water at 110° F
 - Aqueous solution of iodine (50 ppm iodine) made by adding approximately 0.8 milliliters of tincture of iodine (6-8 grams ammonium or potassium iodide per 100 cc of 45 percent alcohol) to one liter of water at 110° F
 - Other commercially available cleansers of equivalent disinfectant quality when used as directed, if their use is recommended or approved by the respirator manufacturer
- Rinse components thoroughly in clean, warm (110° F maximum), preferably running water. Drain. The importance of thorough rinsing cannot be overemphasized.
- Detergents or disinfectants that dry on face pieces may result in dermatitis. In addition some disinfectants may cause deterioration of rubber or corrosion of metal parts if not completely removed.
- Components should be hand-dried with a clean lint-free cloth or air-dried.
- Reassemble face piece, replacing filters, cartridges, and canisters where necessary.
- Test the respirator to ensure that all components work properly.

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APPENDIX H, Subcontractor Safety Procedure Criteria–Respiratory Protection

The following criteria are not intended to be all inclusive, but are provided as a tool to facilitate development and review of subcontractor safety procedures. Subcontractors are expected to address the following items in their safety procedures.

Minimum Acceptable Criteria for Subcontractor Respiratory Protection Safety Procedures:

- Provide name and qualifications of the “program administrator” responsible for overseeing your respiratory protection program (years and type of experience, training background, etc.).
- Describe training requirements for respirator users.
- Describe medical evaluation requirements for respirator users.
- Describe fit testing requirements for respirator users.
- Describe methods used in the respirator selection process such as estimating exposure level.
- Provide types of respiratory protection to be used, in known.
- If air-purifying respirators will be used for protection against gases, or vapors, or both, describe methods used to determine cartridge or canister change-out schedules.
- Describe respirator procedures to include respirator use, inspection, cleaning and disinfecting, storage, and repair.
- If atmosphere-supplying respirators will be used, describe methods used in providing and maintaining Grade D breathing air.
- Describe methods to be used to evaluate the effectiveness of your respiratory protection program on this project.

APPENDIX I, Use Of Respirators When Not Required Under 29 CFR 1910.134, “Respiratory Protection” Standard

The following information is provided to supplement North Wind Respirator Protection Program (HSP-007) for use of respirators when not required. It is North Wind policy that if respirators are not required under the 29 CFR 1910.134 standard they may only be worn if they don't by their use create an additional hazard. Beyond this issue, respirators worn on a voluntary basis will follow mandatory 29 CFR 1910.134 requirements outlined below (with the exception of the use of filtering face pieces (dust masks) in addition to Appendix D requirements provided.

- 1. All personnel who wear a respirator (required or not required under the standard) shall be medically qualified in accordance with 29 CFR 1910.134(e).**

This will be evidenced by a current fitness for duty certificate or medical clearance for the use of respiratory protection. In addition, if the wearer experiences any difficult breathing or discomfort related to respiratory use, they shall remove the respirator and report the problem to the site health and safety representative or site supervisor (if the health and safety representative is not available).

- 2. Respirators worn will be selected based on the “potential” airborne hazard in accordance with 29 CFR 1910.134(d).**

Potential contaminants of concern will be documented to determine the proper selection. This should take the form of a site-specific safety and health plan, task hazard analysis, or equivalent documentation in accordance with HSP-001, *Project Safety Analysis*.

- 3. Respirators will be cleaned, stored, and maintained so that its use does not present a health hazard to the user in accordance with 29 CFR 1910.134(h).**

- 4. Since there will likely be little documented contaminant of concern concentration data available, general guidelines for cartridge change out shall be observed:**

- Change out cartridges whenever breathing resistance is experienced
- Change out cartridges if breakthrough of contaminants is noted
- Change out cartridges weekly during use if none of these conditions are met

- 5. If any condition exists where requirements of 29 CFR 1910.134 requirements are invoked, then all 29 CFR 1910.134 and HSP-007 requirements must be met.**

- 6. All personnel who use respirators when not required under the 29 CFR 1910.134 standard shall read and understand the information contained in this supplement and the 29 CFR 1910.134 Appendix D information below.**

Respirators are an effective method of protection against designated hazards when properly selected and worn. Respirator use is encouraged, even when exposures are below the exposure limit, to provide an additional level of comfort and protection for workers. However, if a respirator is used

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improperly or not kept clean, the respirator itself can become a hazard to the worker. Sometimes, workers may wear respirators to avoid exposures to hazards, even if the amount of hazardous substance does not exceed the limits set by OSHA standards. If your employer provides respirators for your voluntary use, or if you provide your own respirator, you need to take certain precautions to be sure that the respirator itself does not present a hazard.

You should do the following:

1. Read and heed all instructions provided by the manufacturer on use, maintenance, cleaning and care, and warnings regarding the respirators limitations.
2. Choose respirators certified for use to protect against the contaminant of concern. NIOSH, the National Institute for Occupational Safety and Health of the U.S. Department of Health and Human Services, certifies respirators. A label or statement of certification should appear on the respirator or respirator packaging. It will tell you what the respirator is designed for and how much it will protect you.
3. Do not wear your respirator into atmospheres containing contaminants for which your respirator is not designed to protect against. For example, a respirator designed to filter dust particles will not protect you against gases, vapors, or very small solid particles of fumes or smoke.
4. Keep track of your respirator so that you do not mistakenly use someone else's respirator.

NORTH WIND, INC.
ACCIDENT PREVENTION PLAN
ATTACHMENT 12
NWI HSP-11-011, EXCAVATIONS

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HSP-011

Excavations

Revision 1

August 28, 2006

Approved:

Bruce Miller (See letter number 156)

Director, Health and Safety

08/21/06

Date

Sylvia Medina (See letter number 156)

President

08/21/06

Date

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DEFINITIONS

<i>Benching</i>	A method of protecting personnel from cave-ins by excavating the sides of an excavation to form one or a series of horizontal levels or steps, usually with vertical or near-vertical surfaces between levels.
<i>Competent Person</i>	One who is capable of identifying existing and predictable hazards in the surroundings, or working conditions which are unsanitary, hazardous, or dangerous to employees, and who has authorization to take prompt corrective measures to eliminate them.
<i>Excavation</i>	Any man-made cut, cavity, trench, or depression in an earth surface, formed by earth removal.
<i>Hazardous Atmosphere</i>	An atmosphere that by reason of being explosive, flammable, poisonous, corrosive, oxidizing, irritating, oxygen deficient, toxic, or otherwise harmful, may cause death, illness, or injury.

Some specific examples of hazardous atmospheres are provided below.

- Oxygen-deficient atmospheres contain less than 19.5 percent oxygen and can result in a range of disorders from dizziness to unconsciousness and even death at extreme low levels. Normal atmospheres contain 21 percent oxygen (at sea level).
- Oxygen-enriched atmospheres contain greater than 23.5 percent oxygen and can increase the flammability of combustible materials.
- Explosive atmospheres contain flammable gases that exceed 10 percent of the lower explosive limit (LEL).
- Carbon monoxide from the exhausts of earthmoving equipment can collect in excavations. Carbon monoxide causes oxygen starvation and can be fatal at a concentration of 1 percent (10,000 ppm) after a 1 minute exposure. Ventilation or respiratory protection is required when carbon monoxide levels exceed 35 ppm.
- Toxic atmospheres may develop depending on the level of contamination in the soil. Refer to the health and safety plan or field safety instructions for more details.

<i>Shielding</i>	A structure that is able to withstand the forces imposed on it by a cave-in and thereby protects personnel within the structure. Shields can be permanent structures or can be designed to be portable and moved along
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as work progresses. Additionally, shields can be either pre-manufactured or job-built in accordance with OSHA requirements. Shields used in trenches are usually referred to as "trench boxes" or "trench shields."

Shoring

A structure such as a metal hydraulic, mechanical, or timber shoring system that supports the sides of an excavation and that is designed to prevent cave-ins.

Sloping

A method of protecting personnel from cave-ins by excavating to form sides of an excavation that are inclined away from the excavation so as to prevent cave-ins. The angle of incline required to prevent a cave-in varies with differences in such factors as the soil type, environmental conditions of exposure, and application of surcharge loads.

Stable Rock

Refers to natural solid mineral matter that can be excavated with vertical sides and remain intact while exposed.

Trench

A narrow excavation (in relation to its length) made below the surface of the ground. In general, the depth is greater than the width, but the width of a trench (measured at the bottom) is not greater than 15 feet. If forms or other structures are installed or constructed in an excavation so as to reduce the dimension measured from the forms or structure to the side of the excavation to 15 feet or less (measured at the bottom of the excavation), the excavation is also considered to be a trench.

Soil Types

(described in Attachment C – Soil Classification and Definitions)

ACRONYMS

ASTM	American Society for Testing and Materials
CP	Excavation Competent Person
HSP	Health and Safety Plan
HSD	Health and Safety Director
HS&E	Health, Safety, and Environmental
LEL	Lower Explosive Limit
NPDES	National Pollutant Discharge Elimination System
PM	Project Manager
PPE	Personal Protective Equipment

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SCBA	Emergency Self-Contained Breathing Apparatus
SS	Site Supervisor
SSO	Site Safety Officer
SWPPP	Storm Water Pollution Prevention Plan

1. PURPOSE

This Program provides information regarding the hazards and issues associated with excavation operations that must be addressed during a project. All employees who conduct field operations where excavations are present must be aware of these hazards and of the associated safe work practices in compliance with 29 CFR 1926, Subpart P, "Excavations."

Excavation hazards addressed in this procedure include exposure to cave-ins, falls, falling objects, hazardous atmospheres, unstable structures, and excavating into underground utilities. North Wind employees who enter excavations must take precautions to avoid these hazards and be aware of the associated safe work practices.

Note: Some state-OSHA plans (WA, OR, CA) have more stringent excavation requirements. Contact the North Wind Health and Safety Director (HSD) for state-specific information.

2. SCOPE

This procedure applies to North Wind employees and subcontractors who conduct excavations tasks. The Subcontractors' responsibilities are expressly defined through the subcontract terms and conditions, and North Wind's Health and Safety practices in the field are determined based on these defined responsibilities. Consistent with the subcontract, excavation subcontractors must determine how to excavate safely and in compliance with applicable H&S regulations and industry standards, and how to correct deficiencies. North Wind employees shall not direct the means and methods of safe excavation operations or details of corrective actions.

3. RESPONSIBILITIES

3.1 Corporate Health and Safety Director

The HSD is responsible for:

- Discussing concerns raised by the users of this procedure and taking appropriate actions to ensure the effectiveness of this procedure.
- Working with North Wind site supervisors (SS) to ensure this procedure is properly implemented when required.
- Reviewing OSHA requirements and incorporating changes and requirements into this procedure.
- Reviewing the effectiveness of this procedure on an annual basis.

3.2 Site Supervisor

The SS is responsible for:

- Evaluating the specific tasks to be performed to determine if an excavation will be created during the course of the project.
- Ensuring an excavation competent person is assigned to the project where an excavation is present.
- Consulting with the competent person to identify excavation hazards and determine sloping or protective system requirements.
- Informing all affected North Wind employees and subcontractor personnel of the location and hazards of the existing confined spaces.
- Providing field oversight of subcontractors performing excavation tasks and completing the self-assessment checklist for confined-space entry (See Appendix A).
- Suspending excavation operations when a subcontractor is not following excavation procedures.
- Contacting the HSD and PM if the subcontractor is not following excavation procedures.

3.3 Site Safety Officer

The Site Safety Officer (SSO) or SS (if serving in the SSO capacity) is responsible for:

- Supporting the competent person with implementation of excavation hazard mitigation requirements.
- Conducting monitoring of excavation atmosphere if suspected of containing an atmospheric hazard.

3.4 Excavation Competent Person

North Wind or North Wind excavation subcontractors shall provide a competent person to inspect and oversee all excavation activities. The competent person shall have training in and knowledge about soil classification, the use of protective systems, and the requirements of OSHA 29 CFR 1926, Subpart P, “Excavation” standard. The competent person shall be capable of identifying excavation hazards and have the authority to take corrective actions to eliminate the hazards.

The excavation competent person (CP) is responsible for the following:

- Conducting soil classification in accordance with 29 CFR 1926, Subpart P.
- Determining most appropriate protective system for an excavation.

- Designing structural ramps that are used solely by employees as a means of access or egress from excavations.
- Designing structural ramps used for access or egress of equipment, if competent person is qualified in structural design.
- Monitoring the water removal equipment and operations to ensure proper operation if water is controlled or prevented from accumulating by the use of water removal equipment.
- Inspecting excavations subject to runoff from heavy rains.
- Conducting daily inspections of excavations, the adjacent areas, and protective systems shall be made for evidence of a situation that could result in possible cave-ins, indications of failure of protective systems, hazardous atmospheres, or other hazardous conditions.
- Where the competent person finds evidence of a situation that could result in a possible cave-in, indications of failure of protective systems, hazardous atmospheres, or other hazardous conditions, exposed employees shall be removed from the hazardous area until the necessary precautions have been taken to ensure their safety.

4. PROCEDURE

The following subsections provide the minimum project operating requirements that will be used at every project site where excavation operations are conducted. Excavation subcontractors are responsible and accountable for implementing these requirements as well as requirements established in their own safety procedures.

North Wind's project SSO (or SS serving as the SSO) may be required to provide oversight of an excavation subcontractor. The following subsections are provided to inform the SSO of established regulations and industry standards so that an appropriate level of oversight may be provided. Subcontractors retain control over their practices, and North Wind's oversight does not relieve them of their own responsibility for effective implementation and enforcement of H&S requirements.

4.1 General Requirements

- A daily safety briefing/meeting should be conducted by the competent person with all excavation personnel to discuss the work planned for the day and the H&S requirements to be followed.
- Excavations that are to be entered shall be inspected each day by the competent person, as needed throughout the work shift, and after every rain or other event that may increase the potential for excavation cave-in. This inspection shall include, at a minimum, indications of possible cave-in, water accumulation, failure of any component of protective systems, stability of spoil piles and adjacent structures, and indications of hazardous atmosphere.

- If the competent person observes any deficiency or unsafe condition, excavation entry will not be permitted and all exposed personnel shall be removed from the excavation until adequate precautions have been taken to ensure safe entry.
- Walkways shall be provided where personnel are required or permitted to cross over excavations. Walkways 6 feet or more above lower levels shall be equipped with standard guardrails.
- Guardrails, fences, or barricades shall be installed at excavations 6 feet or deeper when the excavations are not readily visible because of plant growth or other visual obstruction.
- Wells, pits, shafts, and similar excavations 6 feet or deeper shall be provided with guardrails, fences, barricades, or covers.
- Earthmoving equipment shall be operated in compliance with OSHA 29 CFR 1926, Subpart O, “Motor Vehicles and Mechanized Equipment.”

4.1.1 Utility Locations

The exact location of underground utilities and structures must be identified. Many states have a one-call phone number for locating underground utilities (refer to the project’s written site safety plan). The assigned competent person has the responsible for this action.

4.1.2 Excavation Subcontractor Selection

Where North Wind is not self-performing the excavation tasks, excavation subcontractors are selected based on project-specific requirements. The “Subcontractor Safety Procedure Criteria—Excavations” found in Appendix A provides the minimum criteria for excavation safety procedures. These criteria shall be used by the SS in conjunction with the SSO and HSS to review subcontractor excavation procedures submitted when North Wind oversight is required.

4.2 Prior to Excavating

- The location of underground utilities such as electric, fuel, water, cable, telephone, and sewer, either in service or abandoned, and underground installations such as foundations, underground storage tanks, and any other structure shall be identified before excavating is permitted. Utility companies and/or installation owners shall be contacted for exact location. When the exact location cannot be identified, detection equipment or other acceptable means of locating the underground installations shall be used before excavation.
- Soil suspected to be contaminated should be sampled and analyzed for characterization prior to excavation.

- If wetlands, endangered species or cultural/historic resources are suspected, they must be identified through field delineation and/or federal or state issued maps. Wetlands may also have protective buffer zones established by state or local regulations.
- A Stockpile Management Plan may be required to address state and local stockpiling requirements. Check with the Project Manager (PM) to determine if a Stockpile Management Plan is required.
- Local requirements for dewatering excavations and discharging must be discussed with the SS.
- A Storm Water Pollution Prevention Plan (SWPPP) or an Erosion and Sediment control Plan may be required where construction activities are greater than a threshold area (1 to 5 acres, depending on project location).

4.3 Excavation Activities

- All rocks, trees, and other surface encumbrances that are undermined or could become unstable as a result of excavating activities shall be removed or supported to prevent them from falling into the excavation.
- Support systems such as shoring, bracing, or underpinning shall be used to support exposed underground utilities that may become unstable due to excavating operations.
- Excavating below the base of a foundation, wall, sidewalk, or other surface structure shall not be permitted unless: 1) a support system is provided to ensure the stability of the structure, 2) the excavation is in stable rock, or 3) a registered professional engineer has determined that the structure is sufficiently removed and will be unaffected by the excavating activity.
- When mobile equipment is required to approach the edge of an excavation and the operator does not have a clear and direct view of the edge, warning systems such as barricades, hand and/or mechanical signals, or stop logs shall be in place to remind the operator of the location of the edge.
- Stockpiles may require liners and covers and excavations may require silt fences, covering or other best management practices to control erosion or runoff.
- Fugitive dust and noise must be monitored and suppressed where necessary.

4.4 Excavation Entry

- Trenches greater than 4 feet deep shall be provided with a ladder, stairway, or ramp positioned so that the maximum lateral travel distance is no more than 25 feet.

- Structural ramps used solely by personnel shall be designed by a competent person. Structural ramps used by equipment shall be designed by a competent person qualified in structural design (generally a registered professional engineer).
- The atmosphere of excavations greater than 4 feet deep shall be tested prior to entry where a hazardous atmosphere exists or could reasonably be expected to exist, such as excavating landfills, hazardous waste dumps, or areas containing sewer or gas utility systems, petroleum distillates, or areas where hazardous substances are stored nearby.
- When atmospheric testing indicates a hazardous atmosphere exists or could reasonably be expected to exist, emergency rescue equipment such as safety harness and lifeline and emergency self-contained breathing apparatus (SCBA) shall be readily available.
- When atmospheric testing indicates a hazardous atmosphere is present, ventilation or appropriate respiratory protection shall be used to eliminate or reduce exposure to safe levels. If ventilation is used, atmospheric testing shall be conducted as often as necessary to ensure safe levels are maintained.
- Personnel shall wear appropriate personal protective equipment (PPE). Minimum protection includes safety-toed shoes/boots, hard hats, and safety glasses. Gloves, coveralls, Tyvek, and respirators may also be required based on the chemical hazards (refer to the project's written site safety plan).
- Excavations that have accumulated water shall not be entered unless precautions have been taken to prevent excavation undermining and cave-ins. Precautions may include special support systems or shield systems, water removal equipment that is monitored by the competent person to ensure proper operation, or safety harnesses and lifelines. No water may be discharged on-site without prior consultation with the SS.
- Adequate precautions such as diversion ditches or dikes shall be used to prevent surface water from entering the excavation and to provide adequate drainage of the area adjacent to the excavation when the natural drainage of surface water is interrupted.
- Personnel shall be protected from materials falling or rolling from the face of the excavation by scaling to remove loose material or installing protective barricades.
- Spoil piles, material, and equipment must be kept at least 2 feet from the edge of the excavation or a retaining device must be used to prevent the material from falling into the excavation.

4.5 Protective Systems

The excavation competent person is responsible for determining the appropriate protective system to be used to prevent excavation cave-in. This determination may be based on the soil classification, space limitations, available materials, work to be done in the excavation, and

availability of tabulated data or a registered professional engineer. North Wind must carefully rely on the expertise of the competent person in consultation with the HSD with regard to excavation protective systems. A selection flow chart for protective systems in accordance with 29 CFR 1926 Subpart P, Appendix D is provided in Appendix C, "Selection of Protective Systems." The following information is provided to give a general understanding of the OSHA excavation protective system requirements. For more specific information, refer to "Protective System Requirements Summary" found in Appendix D.

- Sloping, benching, shoring, shielding, or other protective systems are required to protect personnel from cave-ins except when the excavation is made entirely in stable rock, or is less than 5 feet deep and there is no indication of possible cave-in, as determined by the competent person for excavations.
- Protective systems for excavations deeper than 20 feet must be designed or approved by a registered professional engineer.
- If the excavation soil is not classified by the competent person, the maximum allowable slope shall be 34 degrees measured from the horizontal. Refer to Appendix D for details regarding the actual slope and configurations allowed.
- Protective system materials shall be free from damage that might impair their proper function. Damaged components shall be inspected by the competent person to evaluate their suitability for continued use.
- Protective system materials shall be used consistent with manufacturers' recommendations and shall not be subjected to loads exceeding their design limits.
- Protective system materials shall be securely connected together to prevent sliding, falling, kickouts, or other predictable failure.
- Personnel shall be protected from cave-ins while entering and exiting shielding systems.
- Personnel shall not work in shielding systems during installation, removal, or vertical movement. Personnel may remain inside the shield during horizontal movement as long as the shield is not lifted.

4.6 Protective System Removal

- Precautions shall be taken when removing protective system components. Removal shall start at, and progress from, the bottom of excavation. Components shall be released slowly to note any indications of possible failure of remaining components. Temporary structural members may be required to carry the loads imposed on the protective system.
- Backfilling shall take place immediately after removal of the protective system.

4.7 Excavating at Hazardous Waste Sites

The PM and HSM shall be consulted on proper evaluation, disposal, and decontamination procedures involving potential hazardous waste.

- All wastes generated shall be characterized prior to excavation.
- Hazardous waste shall be managed and disposed of in accordance with local, state and federal laws.
- If excavation involves hazardous wastes, the decontamination section of the project site safety plan shall be followed. No potentially contaminated equipment shall be permitted to leave the work site.

4.8 Backfill

Backfill may require a clean fill certification by the client, or under a state or local requirement. Analytical testing or letter from the fill supplier certifying that soil is clean may be required.

4.9 Safety Equipment

Excavation subcontractors are responsible for providing all personal protective equipment (PPE) necessary for its employees. North Wind will provide PPE only for its own employees. Other safety equipment will be provided as delineated in the subcontract and referenced documents.

- Detection equipment shall be provided if the exact location of underground utilities cannot be determined by the utility owner.
- Air monitoring instruments, ventilation equipment, and respiratory protection may be required if the potential for a hazardous atmosphere exists within the excavation.
- Emergency rescue equipment (such as self-contained breathing apparatus, safety harnesses, and lifelines) may be required if a hazardous atmosphere exists within the excavation.
- Minimum PPE includes safety-toed shoes/boots, hard hats, and safety glasses. Body protection (such as gloves, coveralls, or Tyvek) may be needed when chemical hazards exist. Hearing protection may be needed when working in proximity to earthmoving equipment.
- Fall protection shall be provided when personnel are exposed to a fall of 6 feet or greater.
- Water removal equipment may be needed to prevent water accumulation in the excavation.
- Shoring, shielding, and other protective systems may be required to protect excavations from cave-in.

- Stockpile and excavation liners and covers may be required.

4.10 Forms/Permits

There are no North Wind forms or permits required for excavating activities.

The following environmental permits may be required. Check with the PM and SS to determine applicability:

- Waste discharge or NPDES permit may be required for water discharged during excavation dewatering.
- ACOE/CWA 404 permit is required for excavation or filling in wetland areas.
- “Dig permit” may be required at certain client facilities.
- USDA soil permit may be required if the project involves transport of soil from any "regulated area" to a "non-regulated area." Regulated areas include most of the south and southeast coastal states that tend to have nematodes and other soil pests (may include other coastal areas).

Excavation subcontractors of tenant facilities may have written procedures or permits governing excavation activities. North Wind personnel entering a subcontractor’s excavation must comply with these procedures.

4.11 Self-Assessment Checklists

The “Health Safety and Environmental (HS&E) Self-Assessment Checklist - Excavations” found in Appendix B is provided as a method of verifying compliance with established safe work practices, regulations, and industry standards pertaining to excavation operations.

North Wind’s project competent person, SSO or SS shall use this checklist when: 1) North Wind employees enter excavations and/or 2) North Wind oversight of an excavation subcontractor is required. The HSD shall specify the frequency in which this checklist shall be completed and provide this information in the project’s written safety plan. Completed checklists shall be sent to the HSD for review. The HSD shall assist the SSO or SS in resolving any deficiencies identified during the self-assessment. This Program may be used to clarify checklist questions.

5. RECORDS

The Health and Safety Director will maintain all records in accordance with QAP-171, Records Control:

- HSF-011.1, HS&E Self Assessment Checklist

6. REFERENCES

29 CFR 1926 Subpart P, "Excavations"

29 CFR 1926.652(b)(2)

CFR 1926.652©

ASTM Standards D653-85 and D2488

National Bureau of Standards Report BSS-121

QAP-171, Records Control

APPENDIX A, Subcontractor Safety Procedure Criteria--Excavations

The following criteria are not intended to be all inclusive, but are provided as a tool to facilitate development and review of subcontractor safety procedures. Subcontractors are expected to address the following items in their safety procedures.

1. Provide name and qualifications of the “competent person” responsible for excavation activities (years and type of experience, training background, etc.):
2. Describe excavation and protective system inspection criteria or procedures (frequency of inspections - daily, as needed throughout day, after rains; visual vs. written inspections; items that are inspected):
3. Describe methods of identifying underground utilities (contacting utility companies, detection equipment):
4. Describe methods to sample and analyze soil for characterization where contamination is suspected:
5. Describe methods to identify and protect wetlands, endangered species or cultural/historic resources:
6. Describe specific method(s) of cave-in protection to be used on this project (sloping, benching, shoring, shielding):
7. Describe option(s) that will be used for protective systems determination (soil classification, tabulated data, other data, registered professional engineer design):
8. Describe methods to identify hazardous atmospheres and controls (detection equipment, ventilation, respiratory protection, rescue equipment):
9. Describe methods used to prevent water accumulation (water removal equipment, special support systems, harness and lifelines):
10. Describe best management practices for water, erosion, sediment and fugitive dust control (including stockpile construction standards, excavation covering, storm water pollution prevention, erosion and sediment control and disposal of accumulated storm water/wastewater):
11. Describe methods to analyze backfill material, where required:
12. Describe methods used to protect workers from material falling into the excavation (remove or support objects, keep material 2’ back or restrain, keep workers off slopes):
13. Describe methods used to support adjacent structures near excavations (shoring, bracing, or underpinning; RPE evaluation):

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14. Describe safe work practices for other activities to be performed during this project (use of ladders, fall protection, personal protective equipment, etc.):
15. If hazardous waste project, provide documentation of hazardous waste worker training and medical surveillance records for all project personnel (40-hour or 24-hour training, 8-hour refresher training) and describe methods of hazardous waste management (including accumulation, transport and disposal):
16. Provide summary of equipment that will be needed to perform excavation safely and verify that equipment is in good operational condition (excavation digging equipment, shoring and shielding materials, etc.)
17. Describe methods to certify clean backfill material:

APPENDIX B, Example of HSF-011.1, HS&E Self-Assessment Checklist - Excavations



HS&E SELF-ASSESSMENT CHECKLIST - EXCAVATIONS

This checklist shall be used by North Wind personnel only and shall be completed at the frequency specified in the project's HASP, Task Hazard Analysis, SS or PM.

This checklist is to be used at locations where: 1) North Wind employees enter excavations (complete Sections 1 and 3), and/or 2) North Wind oversight of an excavation subcontractor is required (complete entire checklist).

The competent person or SSO may consult with excavation subcontractors when completing this checklist, but shall not direct the means and methods of excavation operations nor direct the details of corrective actions. Excavation subcontractors shall determine how to correct deficiencies and we must carefully rely on their expertise. Items considered to be imminently dangerous (possibility of serious injury or death) shall be corrected immediately and all exposed personnel shall be removed from the hazard until corrected.

Project Name: _____	Location: _____	Auditor: _____	Title: _____	PM: _____	Project No.: _____	Date: _____
This specific checklist has been completed to (check only one of the boxes below): <input type="checkbox"/> Evaluate North Wind compliance with its confined spaces procedure (HSP-11-011) <input type="checkbox"/> Evaluate a North Wind subcontractor's compliance with its excavation procedure or program Subcontractor's Name: _____						
<input type="checkbox"/> Check "Yes" if an assessment item is complete or correct. <input type="checkbox"/> Check "No" if an item is incomplete or deficient. Section 2 must be completed for all items checked "No." <input type="checkbox"/> Check "N/A" if an item is not applicable. <input type="checkbox"/> Check "N/O" if an item is applicable but was not observed during the assessment.						
Numbers in parentheses indicate where a description of this assessment item can be found in North Wind HSP-11-011.						

SECTION 1

PROCEDURE AREA		Yes	No	N/A	N/O
General Requirements (4.1)					
1	Daily safety briefing/meeting conducted with personnel				
2	Excavation and protective systems adequately inspected by competent person				
3	Defective protective systems or other unsafe conditions corrected before entry				
4	Guardrails provided on walkways over excavation 6' or deeper				
5	Barriers provided at excavations 6' or deeper when not readily visible				
6	Barriers or covers provided for wells, pits, shafts, or similar excavation 6' or deeper				
7	Excavating equipment operated safely				
Prior to Excavation (4.2)					
8	Location of underground utilities and installations identified				
9	Soils characterized prior to excavation where contamination may be present				
10	Excavation area checked for wetlands, endangered species, cultural/historic resources				
11	Stockpile construction and management plan				
12	PM consulted and plan established for wastewater disposal from excavation dewatering				
13	SWPPP prepared for construction site 1-5 acres (depending on project location)				
Excavation Activities (4.3)					
14	Rocks, trees, and other unstable surface objects removed or supported				

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Hs&E SELF-ASSESSMENT CHECKLIST - EXCAVATIONS

15	Exposed underground utility lines supported				
16	Undermined surface structures supported or determined to be in safe condition				
17	Warning system used to remind equipment operators of excavation edge				
18	Stockpile, excavation covers, liners, silt fences in place, where required				
19	Fugitive dust suppressed				
Excavation Entry (4.4)					
20	Trenches > 4' deep provided with safe means of egress within 25'				
21	Structure ramps designed and approved by competent person				
22	Potential hazardous atmospheres tested prior to entry				
23	Rescue equipment provided where potential for hazardous atmospheres exists				
24	Ventilation used to control hazardous atmospheres and air tested frequently				
25	Appropriate respiratory protection used when ventilation does not control hazards				
26	Precautions taken to prevent cave-in from water accumulation in the excavation				
27	Precautions taken to prevent surface water from entering excavation				
28	Protection provided from falling/rolling material from excavation face				
29	Spoil piles, equipment, materials restrained or kept at least 2' from excavation edge				
Protective Systems (4.5)					
30	Protective systems used for excavations 5' or deeper				
31	Protective systems for excavation deeper than 20' designed by registered PE				
32	If soil unclassified, maximum allowable slope is 34 degrees				
33	Protective systems free from damage				
34	Protective system used according to manufacturer recommendations and not subjected to loads exceeding design limits				
35	Protective system components securely connected to prevent movement or failure				
36	Cave-in protection provided while entering/exiting shielding systems				
37	Personnel removed from shielding systems when installed, removed, or vertical movement				
Protective System Removal (4.6)					
38	Protective system removal starts and progresses from excavation bottom				
39	Protective systems removed slowly and cautiously				
40	Temporary structure supports used if failure of remaining components observed				
41	Backfilling taking place immediately after protective system removal				
Excavation at Hazardous Waste Sites (4.7)					
42	Waste disposed of according to HASP/CERCLA/RCRA regulations				
43	Appropriate decontamination procedures being followed, per HASP/THA				
Backfill (4.8)					
44	Backfill certified clean when required by client or local regulation				

APPENDIX C, Soil Classification and Definitions

This attachment describes a method of classifying soil and rock deposits based on site and environmental conditions, and on the structure and composition of the earth deposits. This attachment contains definitions, sets forth requirements, and describes acceptable visual and manual tests for use in classifying soils.

1.0 APPLICATION

This appendix applies when a sloping or benching system is designed in accordance with the requirements set forth in 29 CFR 1926.652(b) (2) as a method of protection for employees from cave-ins. This attachment also applies when timber shoring for excavations is designed as a method of protection from cave-ins in accordance with attachment C to subpart P of part 1926, and when aluminum hydraulic shoring is designed in accordance with attachment D. This attachment also applies if other protective systems are designed and selected for use from data prepared in accordance with the requirements set forth in 29 CFR 1926.652(c), and the use of the data is predicated on the use of the soil classification system set forth in this attachment.

2.0 DEFINITIONS

The definitions and examples given below are based on, in whole or in part, the following; American Society for Testing Materials (ASTM) Standards D653-85 and D2488; The Unified Soils Classification System; The U.S. Department of Agriculture (USDA) Textural Classification Scheme; and The National Bureau of Standards Report BSS-121.

Cemented soil - means a soil in which the particles are held together by a chemical agent, such as calcium carbonate, such that a hand-size sample cannot be crushed into powder or individual soil particles by finger pressure.

Cohesive soil - means clay (fine grained soil), or soil with a high clay content, which has cohesive strength. Cohesive soil does not crumble, can be excavated with vertical side slopes, and is plastic when moist. Cohesive soil is hard to break up when dry, and exhibits significant cohesion when submerged. Cohesive soils include clayey silt, sandy clay, silty clay, clay and organic clay.

Dry soil - means soil that does not exhibit visible signs of moisture content.

Fissured - means a soil material that has a tendency to break along definite planes of fracture with little resistance, or a material that exhibits open cracks, such as tension cracks, in an exposed surface.

Granular soil - means gravel, sand, or silt (coarse grained soil) with little or no clay content. Granular soil has no cohesive strength. Some moist granular soils exhibit apparent cohesion. Granular soil cannot be molded when moist and crumbles easily when dry.

Layered system - means two or more distinctly different soil or rock types arranged in layers. Micaceous seams or weakened planes in rock or shale are considered layered.

Moist soil - means a condition in which a soil looks and feels damp. Moist cohesive soil can easily be shaped into a ball and rolled into small diameter threads before crumbling. Moist granular soil that contains some cohesive material will exhibit signs of cohesion between particles.

Plastic - means a property of a soil which allows the soil to be deformed or molded without cracking, or appreciable volume change.

Saturated soil - means a soil in which the voids are filled with water. Saturation does not require flow. Saturation, or near saturation, is necessary for the proper use of instruments such as a pocket penetrometer or shear vane.

Soil classification system - means, for the purpose of this subpart, a method of categorizing soil and rock deposits in a hierarchy of Stable Rock, Type A, Type B, and Type C, in decreasing order of stability (see definitions below). The categories are determined based on an analysis of the properties and performance characteristics of the deposits and the characteristics of the deposits and the environmental conditions of exposure.

Stable rock - means natural solid mineral matter that can be excavated with vertical sides and remain intact while exposed.

Submerged soil - means soil which is underwater or is free seeping.

Type A soil - Refers to cohesive soils with an unconfined compressive strength of 1.5 tons per square foot (tsf) or greater. Type A soils include clay, silty clay, sandy clay, clay loam, caliche, hardpan, and sometimes silty clay loam and sandy clay loam. No soil should be classified as type A if it is fissured; subject to vibration from heavy traffic, pile driving, or similar effects; has been previously disturbed; or part of a sloped, layered system where the layers dip into the excavation on a slope of four horizontal to one vertical (4H:1V).

Type B soil - Refers to cohesive soils with an unconfined compressive strength greater than 0.5 tsf but less than 1.5 tsf. Type B soils include granular cohesion-less soils like angular gravel, silt, silt loam, sandy loam, and sometimes silty clay loam and sandy clay loam; previously disturbed soils that are not Type C; fissured soils and soils subject to vibration that would otherwise be classified as type A; dry rock that is not stable; and material that is part of a sloped, layered system where the layers dip on a slope less steep than four horizontal to one vertical (4H:1V).

Type C soil - Refers to cohesive soil with an unconfined compressive strength of 0.5 tsf or less. Type C soils include granular soils such as gravel, sand, and loamy sand; submerged soil; soil from which water is freely seeping; submerged rock that is not stable; or material in a sloped, layered system where the layers dip into the excavation at a slope of four horizontal to one vertical (4H:1V) or steeper.

Unconfined compressive strength - means the load per unit area at which a soil will fail in compression. It can be determined by laboratory testing, or estimated in the field using a pocket penetrometer, by thumb penetration tests, and other methods.

Wet soil - means soil that contains significantly more moisture than moist soil, but in such a range of values that cohesive material will slump or begin to flow when vibrated. Granular material that would exhibit cohesive properties when moist will lose those cohesive properties when wet.

3.0 REQUIREMENTS

3.1 Classification of Soil and Rock Deposits

Each soil and rock deposit shall be classified by a competent person as Stable Rock, Type A, Type B, or Type C in accordance with the definitions set forth in paragraph (b) of this appendix.

3.2 Basis of Classification

The classification of the deposits shall be made based on the results of at least one visual and at least one manual analysis. Such analyses shall be conducted by a competent person using tests described in paragraph (d) below, or in other recognized methods of soil classification and testing such as those adopted by the American Society for Testing Materials, or the U.S. Department of Agriculture textural classification system.

3.3 Visual and Manual Analyses

The visual and manual analyses, such as those noted as being acceptable in paragraph (d) of this appendix, shall be designed and conducted to provide sufficient quantitative and qualitative information as may be necessary to identify properly the properties, factors, and conditions affecting the classification of the deposits.

3.4 Layered Systems

In a layered system, the system shall be classified in accordance with its weakest layer. However, each layer may be classified individually where a more stable layer lies under a less stable layer.

3.5 Reclassification

If, after classifying a deposit, the properties, factors, or conditions affecting its classification change in any way, the changes shall be evaluated by a competent person. The deposit shall be reclassified as necessary to reflect the changed circumstances.

3.6 Acceptable Visual and Manual Tests

3.6.1 Visual Tests.

Visual analysis is conducted to determine qualitative information regarding the excavation site in general, the soil adjacent to the excavation, the soil forming the sides of the open excavation, and the soil taken as samples from excavated material.

1. Observe samples of soil that are excavated and soil in the sides of the excavation. Estimate the range of particle sizes and the relative amounts of the particle sizes. Soil that is primarily composed of fine-grained material is cohesive material. Soil composed primarily of coarse-grained sand or gravel is granular material.
2. Observe soil as it is excavated. Soil that remains in clumps when excavated is cohesive. Soil that breaks up easily and does not stay in clumps is granular.
3. Observe the side of the opened excavation and the surface area adjacent to the excavation. Crack-like openings such as tension cracks could indicate fissured material. If chunks of soil spall off a vertical side, the soil could be fissured. Small spalls are evidence of moving ground and are indications of potentially hazardous situations.
4. Observe the area adjacent to the excavation and the excavation itself for evidence of existing utility and other underground structures, and to identify previously disturbed soil.
5. Observed the opened side of the excavation to identify layered systems. Examine layered systems to identify if the layers slope toward the excavation. Estimate the degree of slope of the layers.
6. Observe the area adjacent to the excavation and the sides of the opened excavation for evidence of surface water, water seeping from the sides of the excavation, or the location of the level of the water table.
7. Observe the area adjacent to the excavation and the area within the excavation for sources of vibration that may affect the stability of the excavation face.

3.6.2 Manual Tests

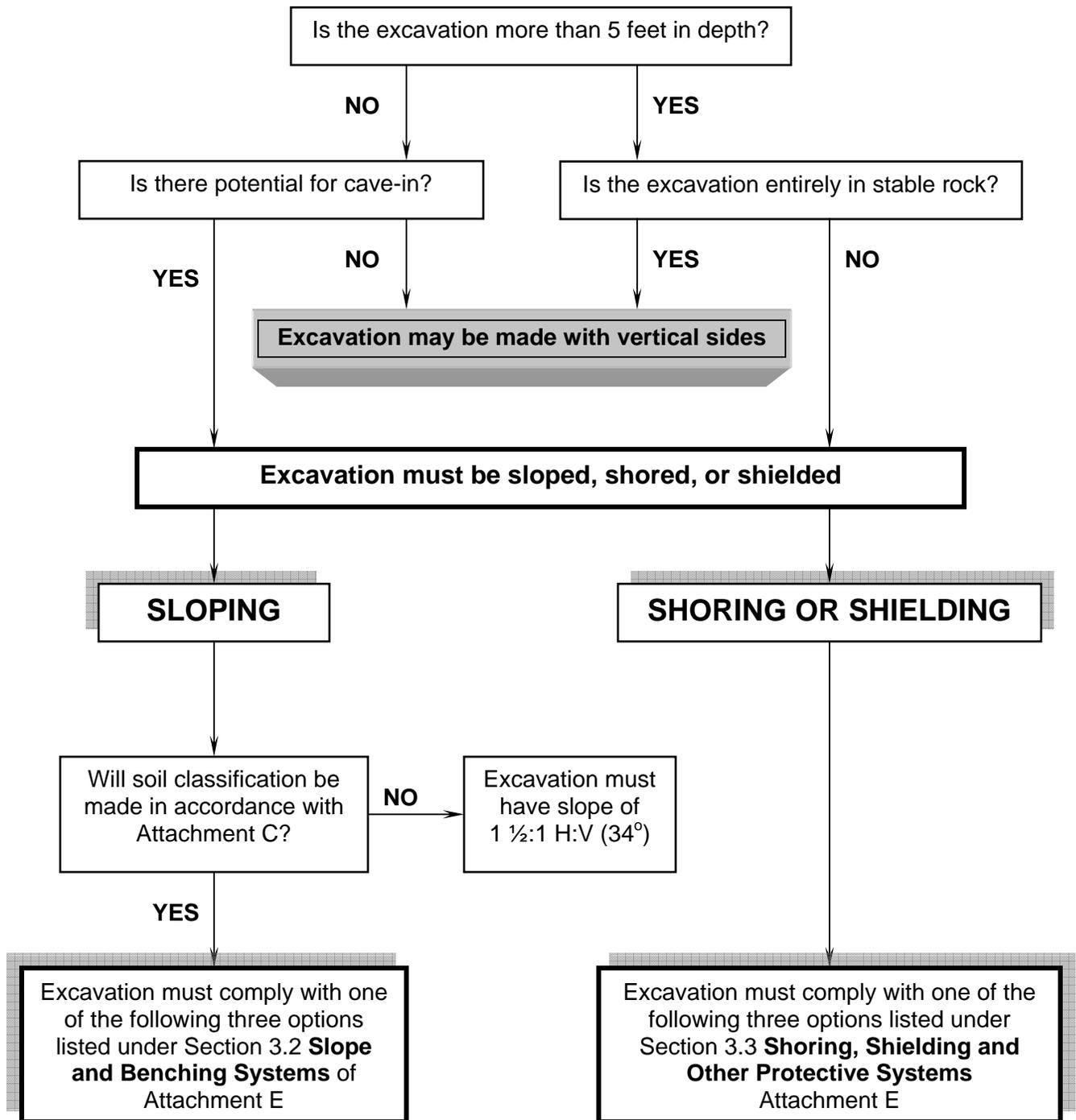
Manual analysis of soil samples is conducted to determine quantitative as well as qualitative properties of soil and to provide more information in order to classify soil properly.

1. Plasticity. Mold a moist or wet sample of soil into a ball and attempt to roll it into threads as thin as 1/8-inch in diameter. Cohesive material can be successfully rolled into threads without crumbling. For example, if at least a two inch (50 mm) length of 1/8-inch thread can be held on one end without tearing, the soil is cohesive.
2. Dry Strength. If the soil is dry and crumbles on its own or with moderate pressure into individual grains or fine powder, it is granular (any combination of gravel, sand, or silt). If the soil is dry and falls into clumps which break up into smaller clumps, but the smaller clumps can only be broken up with difficulty, it may be clay in any combination with gravel, sand or silt. If the dry soil breaks into clumps which do not break up into small clumps and which can

only be broken with difficulty, and there is no visual indication the soil is fissured, the soil may be considered unfissured.

3. **Thumb Penetration.** The thumb penetration test can be used to estimate the unconfined compressive strength of cohesive soils. (This test is based on the thumb penetration test described in American Society for Testing and Materials (ASTM) Standard designation D2488 - "Standard Recommended Practice for Description of Soils (Visual - Manual Procedure).") Type A soils with an unconfined compressive strength of 1.5 tsf can be readily indented by the thumb; however, they can be penetrated by the thumb only with very great effort. Type C soils with an unconfined compressive strength of 0.5 tsf can be easily penetrated several inches by the thumb, and can be molded by light finger pressure. This test should be conducted on an undisturbed soil sample, such as a large clump of spoil, as soon as practicable after excavation to keep to a minimum the effects of exposure to drying influences. If the excavation is later exposed to wetting influences (rain, flooding), the classification of the soil must be changed accordingly.
4. **Other Strength Tests.** Estimates of unconfined compressive strength of soils can also be obtained by use of a pocket penetrometer or by using a hand-operated shear vane.
5. **Drying Test.** The basic purpose of the drying test is to differentiate between cohesive material with fissures, unfissured cohesive material, and granular material. The procedure for the drying test involves drying a sample of soil that is approximately one inch thick (2.54 cm) and six inches (15.24 cm) in diameter until it is thoroughly dry:
 - a. If the sample develops cracks as it dries, significant fissures are indicated.
 - b. Samples that dry without cracking are to be broken by hand. If considerable force is necessary to break a sample, the soil has significant cohesive material content. The soil can be classified as an unfissured cohesive material and the unconfined compressive strength should be determined.
 - c. If a sample breaks easily by hand, it is either a fissured cohesive material or a granular material. To distinguish between the two, pulverize the dried clumps of the sample by hand or by stepping on them. If the clumps do not pulverize easily, the material is cohesive with fissures. If they pulverize easily into very small fragments, the material is granular.

APPENDIX D, Selection of Protective Systems



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APPENDIX E, Protective Systems Requirements Summary

1.0 APPLICABILITY

Each employee in an excavation shall be protected from cave-ins by an adequate protective system designed in accordance with this attachment and 29 CFR 1926 Subpart P except when:

- Excavations are made entirely in stable rock; or
- Excavations are less than 5 feet (1.52 m) in depth and examination of the ground by a competent person provides no indication of a potential cave-in.

Protective systems shall have the capacity to resist without failure all loads that are intended or could reasonably be expected to be applied or transmitted to the system.

This attachment contains specifications for sloping and benching when used as methods of protecting employees working in excavations from cave-ins. The requirements of this attachment apply when the design of sloping and benching protective systems is to be performed in accordance with the requirements set forth in 1926.652(b)(2).

2.0 DEFINITIONS

Actual Slope - means the slope to which an excavation face is excavated.

Distress - means that the soil is in a condition where a cave-in is imminent or is likely to occur. Distress is evidenced by such phenomena as the development of fissures in the face of or adjacent to an open excavation; the subsidence of the edge of an excavation; the slumping of material from the face or the bulging or heaving of material from the bottom of an excavation; the spalling of material from the face of an excavation; and raveling, i.e., small amounts of material such as pebbles or little clumps of material suddenly separating from the face of an excavation and trickling or rolling down into the excavation.

Maximum Allowable Slope - means the steepest incline of an excavation face that is acceptable for the most favorable site conditions as protection against cave-ins, and is expressed as the ratio of horizontal distance to vertical rise (H:V).

Short Term Exposure - means a period of time less than or equal to 24 hours that an excavation is open.

Soil Type – Defined in Attachment C

3.0 REQUIREMENTS

3.1 Soil Classification

Soil and rock deposits shall be classified in accordance with Attachment 3.

3.2 Slope and Benching Systems

Sloping and benching systems must be designed by a registered professional engineer for excavations deeper than 20 feet. System design for excavations 20 feet or less in depth must be selected and constructed by using one or more of the following options:

Option 1: *Soil classification not required.* Maximum allowable slope = 1 ½ horizontal (H) to 1 vertical (V) or 34 degrees measured from the horizontal. Acceptable configurations are described below.

Option 2: *Maximum allowable slope based on the soil classification type.* A competent person must classify the soil as Stable rock, Type A, Type B, or Type C based on at least one visual and at least one manual analysis. Acceptable soil classification test methods are outlined in Attachment 3. The maximum allowable slope for given soil classifications is presented in Table 1 below.

Maximum Allowable Slope.

The maximum allowable slope for a soil or rock deposit shall be determined from Table 1 below.

Table 1. Maximum Allowable Slopes

Soil Type	Maximum Allowable Slopes (H:V) ¹ for Excavations Less Than 20 Feet Deep ²
Stable rock	Vertical (90 degrees)
Type A	¾ : 1 (53 degrees)
Type A – open less than 24 hours and 12' or less in depth	½ : 1 (63 degrees)
Type B	1: 1 (45 degrees)
Type C	1 ½ : 1 (34 degrees)
¹ Numbers shown in parentheses next to maximum allowable slopes are angles expressed in degrees from the horizontal. Angles have been rounded off. ² Sloping or benching for excavations greater than 20 feet deep shall be designed by a registered PE.	

Actual Slope (for Options 1 and 2 above)

- The actual slope shall not be steeper than the maximum allowable slope.
- The actual slope shall be less steep than the maximum allowable slope, when there are signs of distress. If that situation occurs, the slope shall be cut back to an actual slope which is at least 1/2 horizontal to one vertical (1/2H:1V) less steep than the maximum allowable slope.
- When surcharge loads from stored material or equipment, operating equipment, or traffic are present, a competent person shall determine the degree to which the actual slope must be reduced below the maximum allowable slope, and shall assure that such reduction is achieved. Surcharge loads from adjacent structures shall be evaluated in accordance with 1926.651(i).

Option 3: Maximum allowable slope based on other tabulated data, such as tables and charts. The identity of the approving registered professional engineer must be stamped on the data. The tabulated data must be in written form, describing detailed information on its use and limitations, and must be at the jobsite during construction of the protective system.

Option 4: Sloping or benching designs prepared and approved by a registered professional engineer. The identity of the registered professional engineer who approved the data must be stamped on the design. The design must identify the project and the configurations must be determined safe for the project. The design must be at the jobsite during construction of the protective system.

3.2.2 Slope Configurations

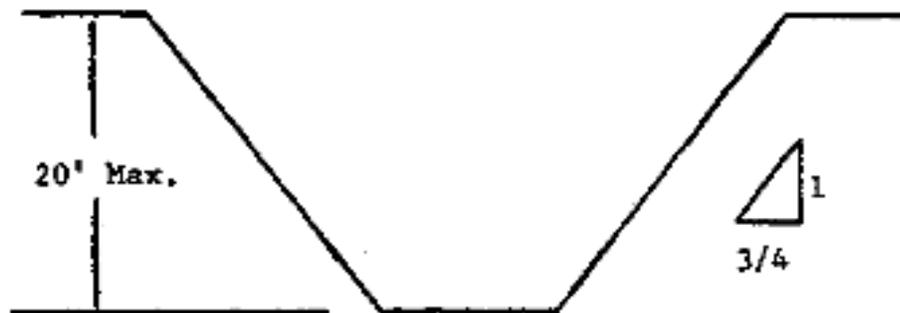
Slope configurations of sloping and benching systems shall be in accordance with the figures below for each soil type (All slopes stated below are in the horizontal to vertical ratio).

EXCAVATIONS MADE IN TYPE A SOIL

Simple Slopes

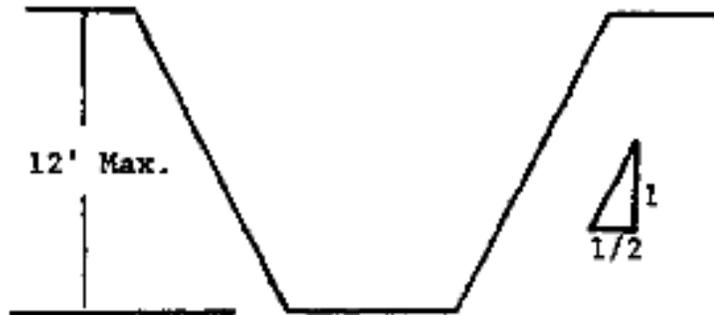
Simple Slope - General

All simple slope excavations 20 feet or less in depth shall have a maximum allowable slope of **3/4:1**.



Simple Slope - Short Term

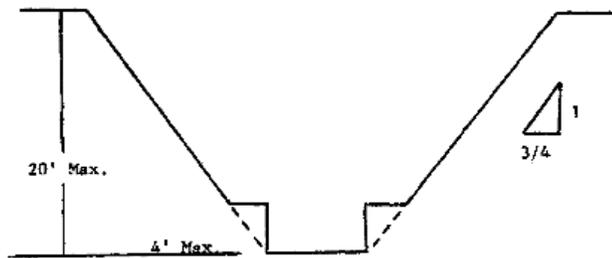
Simple slope excavations which are open 24 hours or less (short term) and which are 12 feet or less in depth shall have a maximum allowable slope of **1/2:1**.



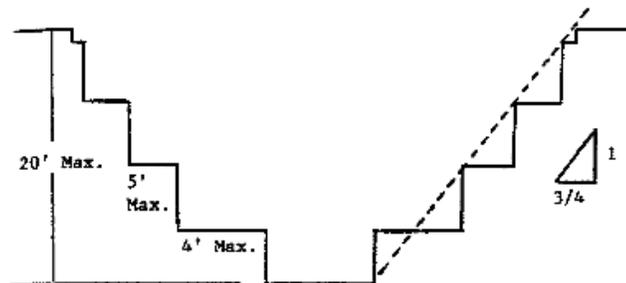
Benched Excavations

Simple Bench

All benched excavations 20 feet or less in depth shall have a maximum allowable slope of **3/4:1** and maximum bench dimensions as follows:



Multiple Bench



Unsupported & Supported Vertical Sided Lower Portion Excavations

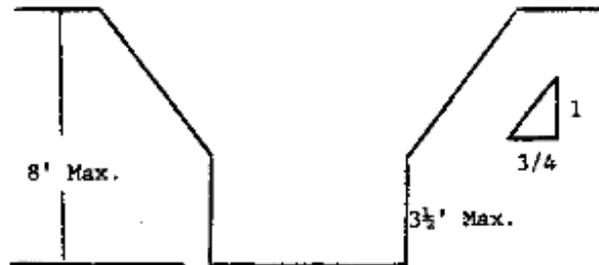
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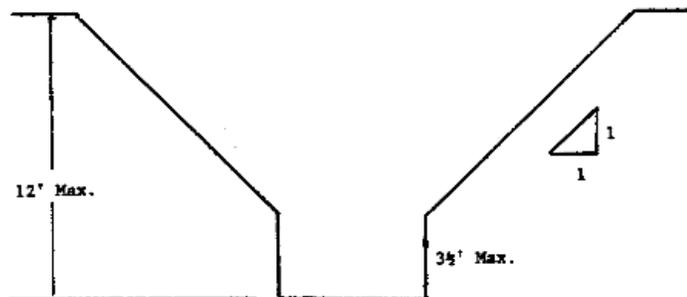
All excavations 8 feet or less in depth which have unsupported vertically sided lower portions shall have a maximum vertical side of **3 1/2 feet**.

Unsupported Vertically Sided Lower Portion - Maximum 8 Feet In Depth



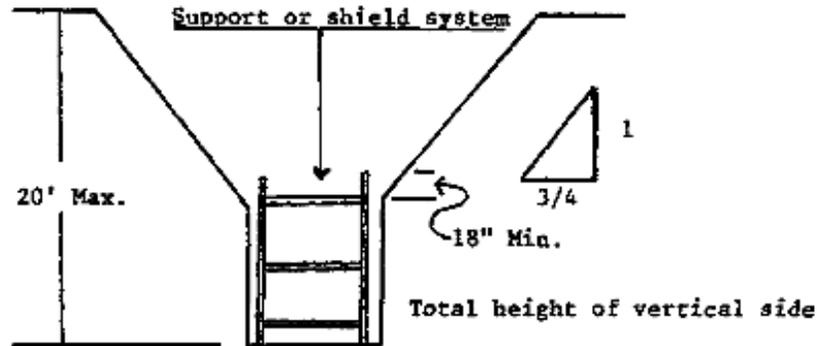
All excavations more than 8 feet but not more than 12 feet in depth with unsupported vertically sided lower portions shall have a maximum allowable slope of **1:1** and a maximum vertical side of **3 1/2 feet**.

Unsupported Vertically Sided Lower Portion - Maximum 12 Feet In Depth



All excavations 20 feet or less in depth which have vertically sided lower portions that are supported or shielded shall have a maximum allowable slope of **3/4:1**. The support or shield system must extend at least 18 inches above the top of the vertical side.

Supported or Shielded Vertically Sided Lower Portion

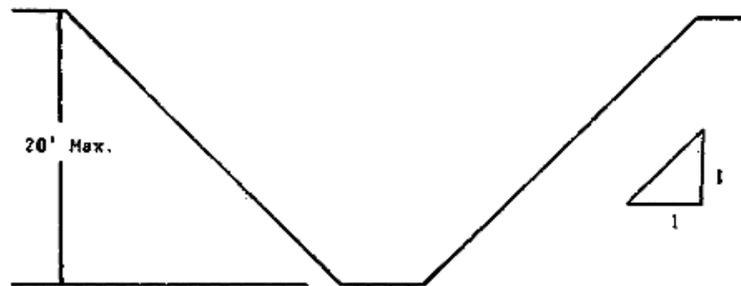


All other simple slope, compound slope, and vertically sided lower portion excavations in Type A soil shall be in accordance with the other options permitted under 1926.652(b).

EXCAVATIONS MADE IN TYPE B SOIL

Simple Slope

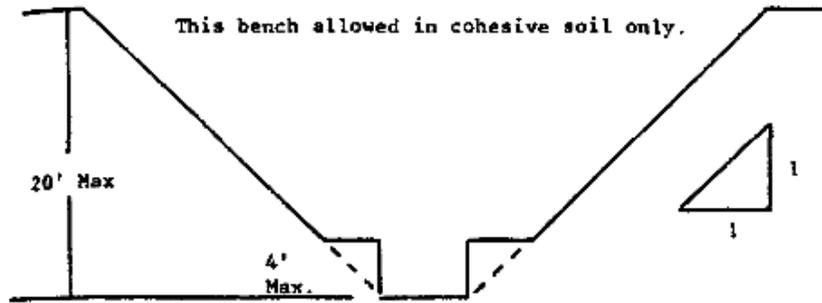
All simple slope excavations 20 feet or less in depth shall have a maximum allowable slope of **1:1**.



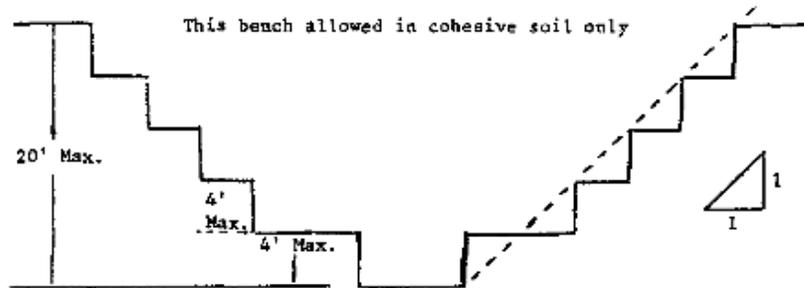
Benched Excavations

All benched excavations 20 feet or less in depth shall have a maximum allowable slope of **1:1** and maximum bench dimensions as follows:

Single Bench



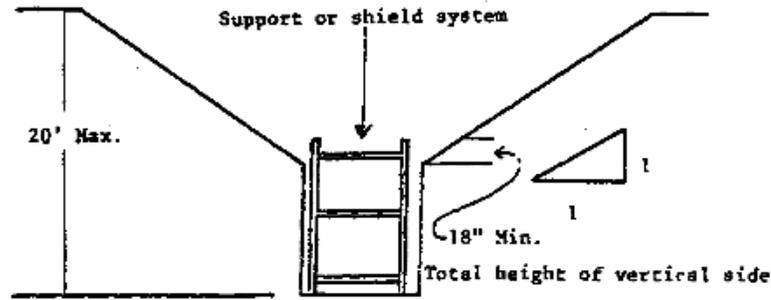
Multiple Bench



Vertical Sided Lower Portion

All excavations 20 feet or less in depth which have vertically sided lower portions shall be shielded or supported to a height at least 18 inches above the top of the vertical side. All such excavations shall have a maximum allowable slope of **1:1**.

Vertically Sided Lower Portion

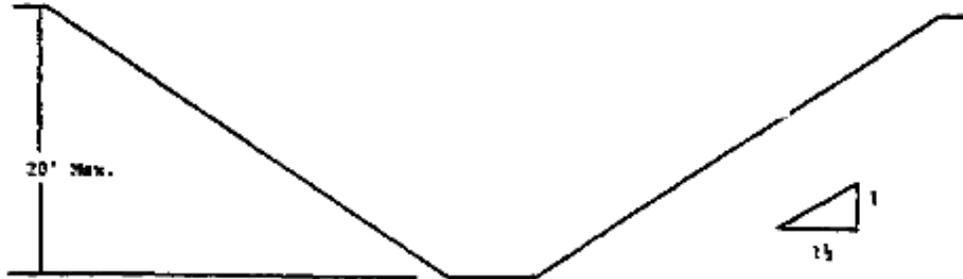


All other sloped excavations in Type B soil shall be in accordance with the other options permitted in 1926.652(b).

EXCAVATIONS MADE IN TYPE C SOIL

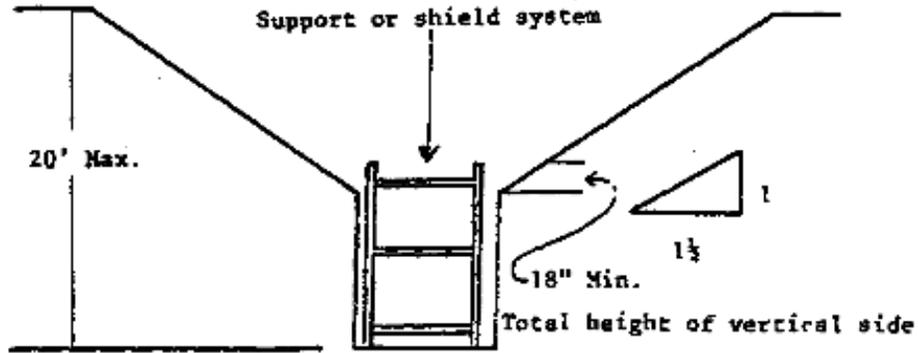
All simple slope excavations 20 feet or less in depth shall have a maximum allowable slope of **1 1/2:1**.

Simple Slope



2. All excavations 20 feet or less in depth which have vertically sided lower portions shall be shielded or supported to a height at least 18 inches above the top of the vertical side. All such excavations shall have a maximum allowable slope of **1 1/2:1**.

Vertical Sided Lower Portion

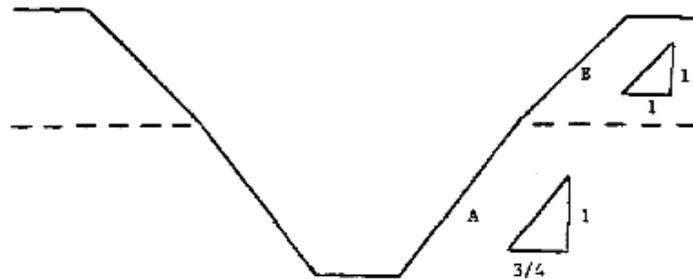


All other sloped excavations in Type C soil shall be in accordance with the other options permitted in 1926.652(b).

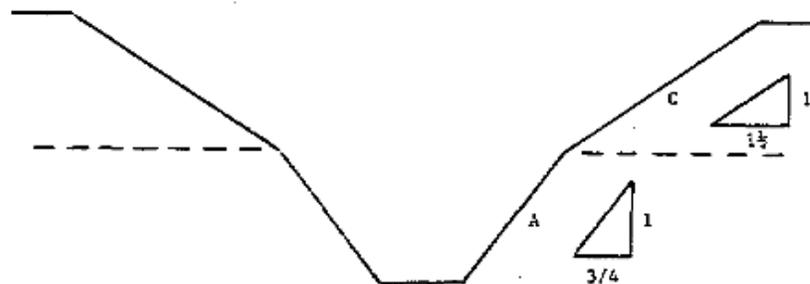
EXCAVATIONS MADE IN LAYERED SOILS

All excavations 20 feet or less in depth made in layered soils shall have a maximum allowable slope for each layer as set forth below. (A, B, & C below represent the soil type as defined in Attachment C)

Type B over Type A



Type C over Type A

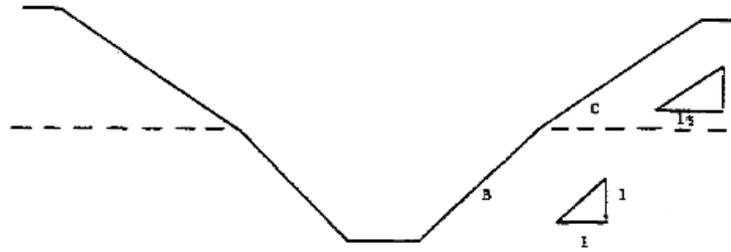


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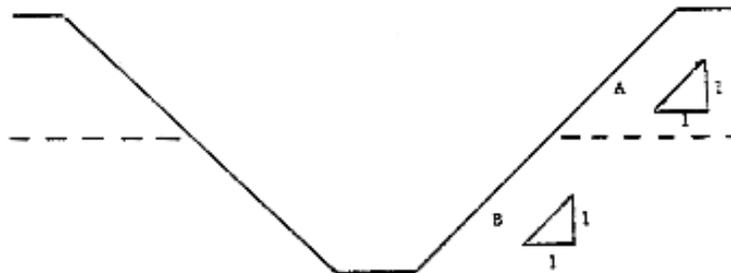
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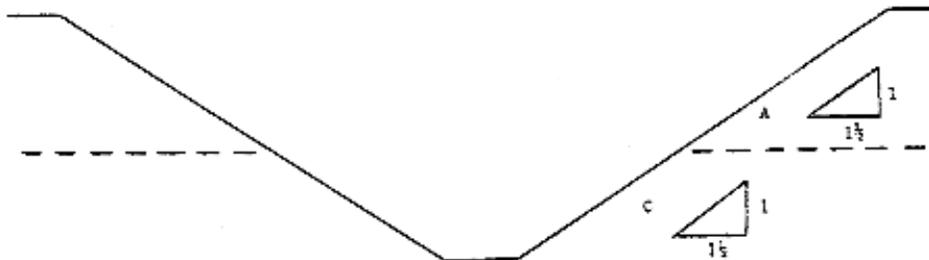
Type C over Type B



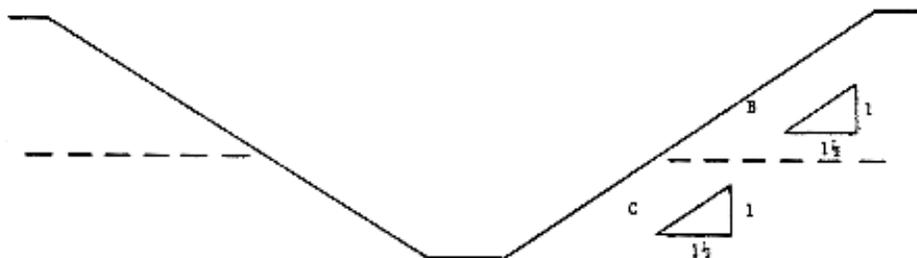
Type A over Type B



Type A over Type C



Type B over Type C



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All other sloped excavations in layered soil types shall be in accordance with the other options permitted in 1926.652(b).

3.3 Shoring, Shielding and Other Protective Systems

Shoring, shielding, and other protective systems must be selected and constructed by using one of the following options. Soil classification using Attachment 3 is required for each option.

Option 1: Timber shoring design determined in accordance with the conditions and requirements of Appendix C of OSHA 29 CFR 1926 Subpart P. Aluminum hydraulic shoring design determined in accordance with Option 2, unless the manufacturer's tabulated data cannot be utilized. In such cases Appendix D of OSHA 29 CFR 1926 Subpart P shall be followed. This option may only be used for excavations 20 feet or less in depth.

Option 2: Designs for protective systems determined in accordance with the specifications, recommendations, and limitations of the manufacturer's tabulated data. The manufacturer must issue written approval to deviate from these requirements and the approval must be available at the jobsite.

Option 3: Protective system designs determined using other tabulated data, such as tables and charts. The identity of the approving registered professional engineer must be stamped on the data. The tabulated data must be in written form, describing detailed information on its use and limitations, and must be at the jobsite during construction of the protective system.

Option 4: Protective system designs prepared and approved by a registered professional engineer. The identity of the registered professional engineer who approved the data must be stamped on the design. The design must identify the project and the configurations must be determined safe for the project. The design must be in written form, describing detailed information on its use and limitations, and must be at the jobsite during construction of the protective system.

NORTH WIND, INC.
ACCIDENT PREVENTION PLAN
ATTACHMENT 13
NWI HSP-11-012, CONTROL OF HAZARDOUS ENERGY (LO/TO)

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HSP-012

**Control of Hazardous Energy
(Lockout/Tagout)**

Revision 1

August 28, 2006

Approved:

Bruce Miller (See letter number 156)

Director, Health and Safety

08/21/06

Date

Sylvia Medina (See letter number 156)

President

08/21/06

Date

REVISION HISTORY

Revision No.	Effective Date	Sections Affected	Description
0	11/22/05	All	This document supersedes ESH-012, Control of Hazardous Energy, Rev. 2.
1	08/28/06	All	Revised document numbers for corporate plans, policies, procedures, and forms, and corrected references to these documents, to reflect the number changes per Letter NW-2006-156. Also made minor formatting changes (i.e., moved definitions and acronyms to the front of the document and changed page numbers) per QAP-061_Rev 2.

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DEFINITIONS

None

ACRONYMS

FP	Facility Procedure
H&S	Health and Safety
HSD	Health and Safety Director
LO	Lockout
PPE	Personal Protective Equipment
SOP	Standard Operational Procedure
SS	Site Supervisor
SSO	Site Safety Officer
TO	Tagout

1. PURPOSE

The purpose of this lockout/tagout (LO/TO) procedure is to provide the minimum safety and health requirements and procedures applicable to the conduct of operations involving the LO/TO of hazardous energy sources. The control of hazardous energy sources and subsequent prevention of hazardous energy release is provided by an effective LO/TO system.

2. SCOPE

The hazards addressed in this LO/TO Program cover hazardous energy releases that may occur during the installation, maintenance, service, or repair of machines, equipment, processes, or systems. Hazardous energy releases involve the unexpected energization or start up of machines or equipment or the release of stored energy.

This LO/TO procedure applies to all North Wind personnel, including subcontractor personnel, who are potentially exposed to hazardous energy sources because of their proximity to the work location. This LO/TO Program is intended to contain requirements needed to ensure compliance with [29 CFR 1910.147](#), Control of Hazardous Energy (Lockout/Tagout) regulatory compliance.

The LO/TO Program **DOES NOT** apply to:

- Minor tool changes, adjustments, and other minor servicing activities that take place during normal operations provided that such activities are routine, repetitive, and integral to the use of the equipment and the work is performed using alternative measures that provide effective personnel protection.
- Work on cord and plug-connected electric equipment if exposure to the hazards of unexpected energization of the equipment is controlled by unplugging the equipment from the energy source and if the plug is under the exclusive control of the employee performing service or maintenance. Pneumatic tools may also fall into this category provided that they can be completely isolated from their energy source.
- Hot-tap operations that involve transmission and distribution systems for electricity or substances (e.g., gas, steam, water, or petroleum products), when these activities are performed on energized electrical systems or pressurized pipelines, provided that the supervisor can demonstrate:
 - Continuity of service is essential **AND**
 - Shutdown of the system is impractical **AND**

- Documented procedures are followed and special equipment that will provide proven, effective protection for employees is used.

North Wind client or facility-specific LO/TO requirements may apply to certain projects. In the event other facility-specific LO/TO requirements apply, these additional requirements will be met so long as they do not conflict with this procedure. In cases where there are conflicting requirements, contact the North Wind Health and Safety Director (HSD) for further guidance.

3. RESPONSIBILITIES

In order for the LO/TO procedure to be effective, all affected individuals must clearly understand and take an active role in meeting their responsibilities. Due to the potential hazards associated with many types of work and equipment, the specific responsibilities outlined below must be followed.

In addition to the duties and responsibilities of authorized employees outlined in the following sections, other work groups at the facility or project site will play an important role in supporting the successful implementation of this program.

Both the responsibilities for health and safety (H&S) and North Wind's H&S practices in the field are expressly defined through the subcontract terms and conditions. North Wind sub-contractors must determine how to perform lockout/tagout activities safely and in compliance with applicable OSHA regulations and industrial standards, and determine how to correct identified deficiencies.

3.1 Corporate Health and Safety Director

The North Wind HSD is responsible for the overall development, and administration of the Control of Hazardous Energy (LO/TO) Program and this procedure. Responsibilities include:

- Evaluating and updating the Written Control of Hazardous Energy (LO/TO) procedure on an annual basis or as procedures or conditions change
- Providing regulatory and safety expertise to project managers and other Site Supervisors
- Providing training to affected and authorized employees, LO/TO Site Supervisors, Project Managers and others
- Performing field audits, soliciting feedback and reporting to Project Managers, Site Supervisors, and Site Safety Officers (SSOs).

3.2 Project Manager

The Project Manager shall be responsible for ensuring the availability of the resources needed to implement this LO/TO procedure, and shall also ensure that this procedure is incorporated in plans, procedures and training for sites where LO/TO operations are to be implemented.

3.3 Site Supervisor

The Site Supervisor (SS) is responsible for the day to day implementation of the LO/TO procedure for the individual projects. The Site Supervisor shall ensure that:

- Hazard assessments have been conducted for all equipment prior to work being performed
- Lockout/tagout procedures have been developed for all equipment as appropriate
- Employees are implementing appropriate lockout/tagout procedures
- All affected and authorized personnel have been trained
- Investigations are conducted after all incidents and coordinated with HSD
- Appropriate energy isolating device and tags are made available to authorized employees
- The issuance of lockout devices (including individually keyed locks) are recorded on a log
- A master key for the locks of his/her authorized employees is maintained in a secure location. A supervisor may remove an authorized employee's safety lock during an emergency only. Group lockout/tagout procedures are performed correctly
- Lockout/tagout procedures during shift changes are coordinated
- Personnel violating lockout/tagout procedures are reported to the program administrator for appropriate disciplinary actions
- All records associated with this program are maintained.

3.4 Site Safety Officer

The SSO or SS (if serving in the SSO capacity) is responsible for:

- Support the site supervisor person with implementation of LO/TO procedure hazard assessment requirements
- Conduct monitoring of LO/TO activities to ensure the procedure is being followed.
- Recommend retraining where problems or issues related to noncompliance with this procedure are noted.

3.5 Subcontractors

The senior onsite manager, foreman, or supervisor of subcontractor employees who may be required to perform LO/TO at North Wind Project sites or facilities must ensure that information concerning the control of hazardous energy is made available to all affected groups.

The following actions are necessary to fulfill this requirement

- Developing and implementing their own Control of Hazardous Energy (Lockout/Tagout) Program (meeting the minimum requirements outlined in Appendix A) and submit this procedure it to the North Wind HSD for review
- To comply with OSHA requirements for multi-employer worksites, providing advance communication to project managers, equipment owners and/or Lockout/Tagout Supervisors when performing a shutdown or lockout/tagout
- Ensuring proper use of their own locks, tags and energy isolation equipment
- Ensuring the proper training of their authorized and affected employees in accordance with the OSHA requirements of 29 CFR 1910.147.

3.6 Authorized Employees

Authorized Employees are personnel who are responsible for implementing LO/TO procedures at the equipment level. They shall attend all required training and demonstrate competence in lockout/tagout procedures. Authorized employees are responsible for:

- Performing lockout and tag procedures in accordance with this procedure
- Coordinating their activities with other authorized employees when using the guidance in for group lockouts and transferring lockout devices and tags when personnel and shift changes.

- Referring to the LO/TO Equipment Supervisor's procedure to identify the type and magnitude of the energy that the machine or equipment utilizes, understanding the hazards of the energy, and knowing the methods to control the energy.
- Participating in periodic inspections of lockout and tag procedures in use when designated by the site supervisor.
- Obtaining the training and retraining specified in this program.

3.7 Affected Employees

Since equipment is locked/tagged out to prevent inadvertent personal injury or equipment damage, affected employees should not attempt to operate any switch, device or other energy isolating device that is locked/tagged out. Affected employees shall become aware of LO/TO procedures used in his/her project site or facility. Affected employees are responsible for:

- Obtaining the training as specified in this written program.
- Complying with all requirements of this LO/TO Program. In particular, affected employees shall not attempt to operate or energize equipment or systems that are locked out and tagged.

4. CONTROL OF HAZARDOUS ENERGY (LOCKOUT/TAGOUT)

All personnel, including contractor subcontractor personnel, involved in LO/TO operations shall be familiar with the potential safety and health hazards associated with the conduct of this operation, and with the work practices and control techniques to be used to reduce or eliminate these hazards.

4.1 LO/TO Procedure Documentation

A written lockout and tag procedure is required before work begins, unless the equipment meets **all** the criteria in Section 4.2. An equipment-specific, written lockout and tag procedure implementing the elements in below is required if the equipment has more than one energy source. This procedure shall describe the controls for potentially hazardous energy when personnel are engaged in activities covered by the North Wind LO/TO procedure. It shall also include:

- A statement identifying the equipment that the procedure covers
- Specific steps for shutting down, isolating, blocking, and securing the equipment to control hazardous energy
- Specific steps for applying, removing, and transferring lockout devices and tags.

- Specific requirements for testing the equipment to verify the effectiveness of the lockout and tag and other energy-control measures
- A written lockout and tag procedure may be included in a standard operational procedure (SOP) or facility procedure (FP), or may be a separate document approved and maintained by the equipment supervisor. In any case, it shall be readily available to any authorized employee and for periodic inspection
- A single, generic procedure may be developed for facilities that have more than one specific type of equipment (e.g., water pumps, air conditioning units, etc.). This procedure shall clearly identify the following elements:
 - Types and locations of equipment operating controls.
 - Types and locations of energy-isolating devices.
 - Types of stored or residual energy and methods to dissipate or block that energy.
 - Method of verifying isolation of the equipment.

4.1.1 Exceptions to Written Procedures

A written lockout and tag procedure is **NOT** required if the equipment satisfies **ALL** of the following criteria:

- The equipment has no potential for stored or residual energy (or re-accumulation of stored energy after shutdown) that could endanger employees.
- The equipment has a single energy source that can be readily identified and isolated.
- The equipment will be completely de-energized and deactivated by the isolation, lockout, and tagging of the energy source.
- The equipment is isolated from the energy source and locked out and tagged during service or maintenance.
- A single lockout device and tag will achieve a locked out and tagged condition.
- Service or maintenance of the equipment does not create hazards for other personnel.
- The equipment has no record of incidents involving unexpected activation or re-energization during service or maintenance.

- The location of the single energy-isolating device is identified by a durable label on or next to the equipment.

4.2 Equipment Evaluations and Hazard Assessments

A *Lockout/Tagout Equipment Hazard Assessment Form* (See Appendix B) will be completed prior to any North Wind personnel conducting service or maintenance work on machines or equipment. The assessment shall identify if there is a potential for an inadvertent release of energy, the type and magnitude of energy present and methods to dissipate the energy. All completed *Lockout/Tagout Equipment Hazard Assessment Forms* shall be maintained at the North Wind facility or project site for the duration of the project or as long as the equipment is in use.

A written LO/TO procedure has been developed for various types of machinery/equipment requiring LO/TO of hazardous energy sources. Section 4.3 through 4.9 detail the general sequence of the LO/TO procedure. Methods for isolating or blocking and securing various energy sources (e.g. mechanical, electrical, thermal or potential motion) are detailed the following sections. Any deviations from a normal lockout/tagout procedure shall be documented and filed in the project file. The Site Supervisor will review and approve all deviations to determine if changes to the procedure are necessary.

4.3 Preparation for Shutdown

The following steps will be conducted prior to the shutdown or isolation of machines or equipment for servicing or maintenance:

1. Only authorized personnel shall implement LO/TO procedures.
2. Authorized personnel shall fully understand the type and magnitude of the energy to be controlled, the means necessary for energy isolation/control, and be able to recognize applicable hazardous energy sources.
3. Prior to maintenance or servicing, the authorized personnel will shut down equipment or machinery by the normal stopping procedure (close valve, open switch, etc.).
4. All sources of hazardous energy will be physically located and the equipment or machine will be deactivated so that the equipment or machine is completely isolated from all energy sources (electrical, hydraulic, pneumatic, etc.).
5. Locks/Tags shall be assigned to each authorized employee by the Site Supervisor, and a LO/TO Device Issue Log (See Appendix C) will be maintained by the site supervisor.

6. The authorized personnel conducting the LO/TO will notify all affected personnel in the area that maintenance and servicing is required, and that the equipment or machine must be shut down and locked/tagged out to perform the maintenance or servicing.

4.4 Application of LO/TO Devices

To ensure the complete control of hazardous energy, the following procedural steps will be followed whenever LO/TO must be conducted:

1. Once all energy sources have been identified, all authorized personnel who will be conducting servicing or maintenance shall affix their own assigned lock and/or tag to the energy controlling devices leading to the equipment or machine.
2. The locks and/or tags will be used to hold these energy-controlling devices in a safe or off position.
3. Stored or residual energy must be dissipated or restrained, as with hydraulic systems, gas, steam, and water pressure, etc., by such methods as blocking and/or bleeding of the stored/residual energy.
4. When the configuration of the controlling device for equipment or machines cannot be secured with a lock, a tag will be used in place of the lock and additional measures will be taken (remove fuses, blocking lines, disconnecting power supply, etc.) to ensure that the status of equipment or machines is in the zero-energy state.
5. When tagout devices are used instead of lockout devices, they must be applied in such a manner as to provide the same level of personnel protection as would be afforded by a lockout device.

4.5 Verification of Isolation

All authorized personnel responsible for the LO/TO will witness or individually verify that the equipment or machine is completely de-energized to its full capacity by:

1. Checking to ensure that no employees are exposed.
2. Attempting to energize or activate the equipment of machine using the normal operational control.
3. Testing to ensure the equipment or machine will not operate.

If there is a possibility of re-accumulation of stored energy to a hazardous level, verification of isolation will be continued until servicing or maintenance has been

completed, or the potential for accumulation no longer exists. After these steps have been accomplished, the authorized person(s) conducting the verification will return the operating controls to the "off" or "neutral" position. Only after these verification steps have been accomplished can the equipment or machinery be considered safe for servicing or maintenance.

4.6 Testing or Repositioning the Equipment or Its Components

If lockout devices and tags must be temporarily removed from energy-isolating devices in order to energize and test the equipment or to reposition any of its components, the authorized employee shall:

1. Clear the equipment of tools and materials and have employees leave the equipment area
2. Remove the lockout devices and tags from the energy-isolating devices in accordance
3. with the procedure set forth in this program
4. Energize the equipment, then proceed with testing the equipment or repositioning the components
5. De-energize all systems and continue with service or maintenance.

4.7 Release From LO/TO

The lockout device and tag shall only be removed from the energy-isolating device by the authorized employee who applied them. In order to ensure the safe and effective removal of LO/TO devices, the following steps will be conducted to allow release from LO/TO:

1. The authorized person(s) who conducted the LO/TO will inspect the area in and around the equipment or machine to ensure non-essential items (tools, spare parts, etc.) and all affected employees have been safely positioned or removed.
2. The authorized person(s) will verify that the operating controls are in the "off" or "neutral" position.
3. The authorized person(s) will notify affected personnel in the area that the equipment or machine is to be re-energized.
4. The authorized person(s) who originally placed the LO/TO devices will remove the lock(s) and/or tag(s) from the energy controlling device(s), and re-energize the equipment or machine.

5. The authorized person will notify affected personnel in the area that the equipment or machine is ready for use.
6. Lock(s) and/or tag(s) shall be returned to the Site Supervisor when the maintenance/servicing task is complete.

4.8 Absence of the Authorized Person(s) During Removal

These procedures are to be followed whenever the authorized person(s) who placed the LO/TO devices is not available at the time of removal. If the authorized employee is on site, LO/TO device(s) shall be removed only by the person(s) to whom it was assigned. When the authorized employee who applied the lockout device and tag is not available, these may be removed by the authorized employee's supervisor (site supervisor or SSO) in consultation with the Project Manager if:

- The authorized employee's supervisor verifies that the authorized employee who applied the lockout device and tag is available. All reasonable efforts must be made to contact the authorized employee to inform him/her that the lockout device and tag is to be removed
- The supervisor determines that the equipment or area is safe before the lock is removed
- The supervisor shall inform the authorized employee that the lockout device and tag were removed before he/she resumes work
- Only with the expressed authorization of his/her supervisor, may any employee remove the safety lock/tag of an authorized employee. This action shall only be taken in the event of an emergency after the authorized employee who placed the safety lock/tag cannot be located or is made unavailable for removal, and after the authorized employee's supervisor has deemed the equipment, system or work-site safe

The supervisor will verify that the authorized employee is not at the facility and that other personnel or equipment is not at any risk. The authorized and affected employees shall be contacted and informed that safety locks and tags have been removed before any further work is resumed on that equipment/system. If the removal of lock or tag by someone other than the authorized person that installed the lock or tag must occur, a form shall be completed and filed for every such instance (See Appendix B).

On occasion, the site supervisor may need to contact an employee at home regarding a lockout/tagout situation. It will be the site supervisor's discretion whether to call the employee into work to remove a lock or tag, or with the employee's concurrence, remove the lock or tag.

4.9 Transferring Lockout Devices and Tags When Personnel or Shifts Change

To maintain continuity in the protection provided to those involved in the lockout and tag procedure, and for the orderly transfer of the lockout and tag device, the steps below are necessary when personnel or shifts change.

Personnel Change. The arriving authorized employee's lock and tag shall be applied before the departing authorized employee's lock and tag are removed.

Shift Change. The lock and tag of at least one authorized employee on the arriving shift shall be applied before any locks and tags of the departing shift are removed. The departing Site Supervisor will inform the arriving Site Supervisor of the status of the equipment and the work in progress and this will be communicated to the field team at the tailgate safety meeting.

5. TRAINING AND COMMUNICATION

5.1 Training of Affected Personnel

Each person working in the area where LO/TO procedures must be implemented shall be instructed in the purpose and use of the LO/TO procedure, and about the prohibitions related to attempts to re-start or re-energize equipment or machinery which are locked or tagged out.

5.2 Lockout Training for Authorized LO/TO Personnel

Each person who will be authorized to conduct LO/TO procedures shall receive training in the following areas prior to using this procedure:

1. The function and purpose of this LO/TO Program
2. Recognition of hazardous energy sources
3. Types and magnitude of the hazardous energy which may be encountered on site
4. The means necessary for energy isolation and control
5. Where tags may be used, training will include procedures for affixing tags and a discussion of the limitations of tagout
6. Hands-on practice training with locks and tags prior to implementing LO/TO activities.

5.3 Tagout Training for Authorized Employees

In the event that only tagout procedures and techniques are used on site, authorized personnel shall be trained in the following limitations of tags:

1. Tags are essentially warning devices affixed to energy isolating devices and do not provide the physical restraint on those devices that is provided by a lock.
2. When a tag is attached to an energy isolating means, it is not to be removed without authorization of the authorized person responsible for it, and it is never to be bypassed, ignored, or otherwise defeated.
3. Tags must be legible and understandable by all authorized and affected personnel whose work operations are, or may be, in the area.
4. Tags must be securely attached to energy isolating devices so that they cannot be inadvertently or accidentally detached during use.
5. The importance of the fact that tags and their means of attachment must be made of materials, which will withstand the environmental conditions, encountered on site.

5.4 Employee Retraining

Retraining of authorized and affected personnel shall be conducted at least annually to reestablish employee proficiency and to introduce new or revised control methods and procedures. Retraining will also be conducted whenever the periodic inspections, as outlined in Section 9.0 of this LO/TO Program reveal inadequacies in the authorized person's knowledge or use of this LO/TO procedures. Also, retraining may be necessary due to changes in job assignments, equipment, machinery, or process that introduces a new hazard.

6. LOCKOUT/TAGOUT MATERIALS AND HARDWARE

All locks, tags, chains, key blocks, or other devices for isolating, securing, blocking, bleeding or isolating energy source shall be provided to the authorized personnel at no charge to these personnel. These devices shall be identified and used solely for the purpose of LO/TO.

6.1 Lockout/Tagout Device Requirements

All LO/TO devices utilized for protection against unexpected energizing or start up of the equipment or machines, or release of stored energy shall meet the following requirements:

1. Lockout and tagout devices shall indicate the identity of the employee applying the device(s).
2. Tagout devices shall warn against hazardous conditions if the equipment or machine is energized and shall include a legend such as: DO NOT START; DO NOT OPEN; DO NOT CLOSE; DO NOT ENERGIZE; DO NOT OPERATE, etc.
3. LO/TO devices shall be of durable construction capable of withstanding the environment for the maximum period of time these devices are exposed.
4. The material used to attach a tagout device shall be of a non-reusable type, attachable by hand, self-locking, and non-releasable with a minimum unlocking strength of no less than 50 pounds and having the general design and basic characteristics of being at least equivalent to a one-piece, environment-tolerant nylon cable tie.
5. Tagout devices shall be constructed and printed so that exposure to weather conditions or corrosive environments will not cause the tag to deteriorate or become illegible.
6. LO/TO devices shall be standardized within the facility by color, shape, and/or size, and print and format of tagout devices shall be standardized.
7. Lockout devices will prevent removal without the use of excessive force or unusual techniques, such as bolt cutters or metal cutting tools.
8. Tagout devices, including their means of attachment, shall prevent inadvertent or accidental removal.
9. Tagout devices are attached at the same location as lockout devices.

6.2 Energy-Isolating Device Requirements

If the energy-isolating devices cannot be locked out:

- Have a qualified person install a suitable lockout attachment on the energy-isolating device, then proceed with the lockout and tag process;

OR

- If approved by the equipment supervisor and facility management, locate a lockable energy-isolating device (e.g., a panel board or switch board feeding the unlockable device) that will effectively isolate the device. Properly isolate, lock, and tag the device;

OR

- Have a qualified person open (or close) the energy-isolating device (i.e., circuit breaker or valve), disconnect the wiring or piping (or insert a blank flange) from the device, and tag the wiring or piping (or blank flange) and the energy-isolating device, then proceed with the lockout and tag process;

NOTE: Any tag used with disconnected wiring, as described above, or any tag used with a blank flange or physically disconnected piping shall indicate the point of disconnect or the location of the blank flange.

OR

- Open (or close) and tag the energy-isolating device. Assign a person as a safety watch to ensure that the energy remains isolated for the duration of service or maintenance, then proceed with the lockout and tag process.

NOTE: A person assigned as a safety watch shall have no other duties, nor shall he/she leave his/her station for any reason, except when formally relieved from duty or for personal safety.

A lockable energy-isolating device shall be installed on equipment before personnel begin any service or maintenance task that might result in the unexpected release of hazardous energy. Non-lockable energy-isolating devices shall be designed or modified to accept a lockout device whenever equipment is replaced, new equipment is installed, or a major modification is performed. In addition, personnel must use personal protective equipment (PPE) when performing these activities as appropriate to job task.

7. PERIODIC INSPECTIONS

The North Wind HSD shall ensure that inspections of the energy control procedures in this program are conducted at least annually. These inspections are intended to ensure that the energy control procedures are appropriate and to provide an assurance to the implementation of the LO/TO Program. The LO/TO Self-Assessment Checklist (See Appendix D) or equivalent may be used to document this inspection.

- The North Wind HSD or Project Manager and an authorized employee other than the one(s) normally utilizing the energy control procedure shall perform the inspection.
- The inspector shall inspect and verify the effectiveness of the energy control procedures. The inspection shall include a review between the inspector and the authorized employee of his/her responsibilities under the energy control procedures being inspected.

- Energy control procedures used less than once a year need only be inspected when used.
- Any deficiencies or changes shall be documented by the inspector and corrected immediately by the Site Supervisor.

8. PERSONAL PROTECTIVE EQUIPMENT REQUIREMENTS

Site personnel shall wear and utilize the type and level of PPE specified in the project Health and Safety Plan, Task Hazard Analysis, or equivalent document when conducting LO/TO operations.

9. SELF ASSESSMENT CHECKLIST

The LO/TO Self-Assessment Checklist (Appendix D) is provided as a method of verifying compliance with established safe work practices, regulations, and industry standards pertaining to LO/TO operations. The Site Supervisor or Project Manager shall use this checklist in the following instances:

1. When North Wind employees are exposed to lockout/tagout hazards

OR

2. When North Wind provides oversight of subcontractor personnel who are performing lockout/tagout operations.

The North Wind HSD staff shall specify the frequency in which this checklist shall be completed and provide this information to the Project Manager. Completed checklists shall be sent to the Project Manager and North Wind HSD for review. The North Wind HSD will assist the Site Supervisor and Project Manager in resolving any deficiencies identified during the self-assessment.

10. RECORDS

The Health and Safety Director will maintain all records for this procedure in accordance with [QAP-171, Records Control](#):

- HSF-012.1, LO/TO Equipment Hazard Assessment Form
- HSF-012.2, Issue Log for LO/TO Devices
- HSF-012.3, LO/TO Self-Assessment Checklist

11. REFERENCES

29 CFR 1926, Subpart P, "Excavations"

QAP-171, Records Control

APPENDIX A, Minimum Acceptable Criteria for Subcontractor Lockout/Tagout Safety Procedures

- Provide the names and qualifications of employees who will be authorized to perform work under lockout/tagout conditions.
- Provide the names and the means of qualifying employees (training and permits) to work on energized electrical equipment.
- Provide a list of tasks and equipment where lockout/tagout will be required.
- Describe the specific lockout/tagout devices to be used for each piece of equipment to de-energize.
- Provide safe-work-practice guidelines on verification of de-energized equipment (testing); isolation, blocking, and dissipating stored or residual energy; notification of affected employees; and verifying all personnel are clear prior to reenergizing systems.
- Describe lockout/tagout inspection criteria or procedures (frequency of inspection; documentation; items to be inspected).
- Provide a copy of the written hazardous energy control program to be used on the project.

APPENDIX D, Example HSF-012.3, LO/TO Self-Assessment Checklist

This checklist shall be used by North Wind personnel only and shall be completed at the frequency specified by the North Wind HSD or Project Manager.

This checklist is to be used at the following locations: 1) Where North Wind employees are exposed to equipment requiring lockout/tagout or 2) Where North Wind provides oversight of subcontractor personnel who are exposed to equipment requiring lockout/tagout.

The Site Supervisor or SSO may consult with subcontractors when completing this checklist, but shall not direct the means and methods of lockout/tagout operations nor direct the details of corrective actions. Subcontractors shall determine how to correct deficiencies and we must carefully rely on their expertise.

Completed checklists shall be sent to the Project Manager and North Wind HSD for review

Items considered to be imminently dangerous (possibility of serious injury or death) shall be corrected immediately, or all exposed personnel shall be removed from the hazard until corrected.



LO/TO SELF-ASSESSMENT CHECKLIST

Project Name: _____ Project No.: _____
 Location: _____ PM: _____
 Auditor: _____ Title: _____ Date: _____

This specific checklist has been completed to (check appropriate):

- Evaluate North Wind employee exposure to equipment requiring lockout/tagout
- Evaluate a North Wind subcontractor's compliance with lockout/tagout requirements
- Subcontractors Name: _____

Check "Yes" if an assessment item is complete/correct.
 Check "No" if an item is incomplete/deficient. Deficiencies shall be brought to the immediate attention of the subcontractor. Section 3 must be completed for all items checked "No."
 Check "N/A" if an item is not applicable.
 Check "N/O" if an item is applicable but was not observed during the assessment.

SECTION 1—SAFE WORK PRACTICES

Yes	No	N/A	N/O	
___	___	___	___	1. Only authorized personnel are performing lockout/tagout
___	___	___	___	2. Only qualified personnel working on energized equipment via energized electrical work permit
___	___	___	___	3. Contractor lockout/tagout programs have been verified prior to start of work
___	___	___	___	4. All affected employees notified of lockout/tagout
___	___	___	___	5. Equipment has been shutdown using normal operating controls
___	___	___	___	6. All energy sources have been isolated
___	___	___	___	7. Individual locks and tags have been applied to energy isolating device
___	___	___	___	8. Stored or residual energy has been relieve or restrained
___	___	___	___	9. Locked/tagged equipment has been tested to verify zero energy state
___	___	___	___	10. All safe guards have been replaced when lockout/tagout is complete
___	___	___	___	11. Controls are positioned in the safe mode prior to lockout/tagout removal
___	___	___	___	12. Only individuals who apply locks/tags may remove them
___	___	___	___	13. Lockout is selected over tagout as preferred method of hazardous energy control
___	___	___	___	14. Master or duplicate keys are prohibited and lock removal is controlled by written procedure
___	___	___	___	15. Multiple work group lockout/tagout activities are coordinated on large projects

SECTION 2—GENERAL

Yes	No	N/A	N/O	
___	___	___	___	16. An energy control program is in place with appropriate procedures
___	___	___	___	17. Lockout or tagout is performed by trained, authorized employees only
___	___	___	___	18. Authorized employees are familiar with facility procedures specific to individual energy types
___	___	___	___	19. Employee do not attempt to start, energize or use equipment that is locked or tagged out
___	___	___	___	20. Affected employees are notified before and after lockout/tagout controls are applied
___	___	___	___	21. Locking is the preferred method of energy control
___	___	___	___	22. Tags are used only where locks cannot be applied
___	___	___	___	23. Additional safety measures are implemented in conjunction with the tagout system

LOCKOUT/TAGOUT DEVICES

VERIFY THAT THIS IS THE CORRECT VERSION BEFORE USE

<https://intranet.nwindenv.com/>

NORTH WIND, INC.
ACCIDENT PREVENTION PLAN
ATTACHMENT 14
NWI HSP-11-014, FALL PROTECTION

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HSP-014

Fall Protection

Revision 1

August 28, 2006

Approved:

Bruce Miller (See letter number 156)

Health and Safety Director

08/21/06

Date

Sylvia Medina (See letter number 156)

President

08/21/06

Date

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APPENDIX D, Example, HSF-014.2 Health and Safety Self Assessment Checklist.....32

DEFINITIONS

<i>Anchorage</i>	A secure point of attachment for lifelines, lanyards or deceleration devices.
<i>Body belt (safety belt)</i>	A strap with means both for securing it about the waist and for attaching it to a lanyard, lifeline, or deceleration device.
<i>Body harness</i>	straps which may be secured about the employee in a manner that will distribute the fall arrest forces over at least the thighs, pelvis, waist, chest and shoulders with means for attaching it to other components of a personal fall arrest system.
<i>Buckle</i>	any device for holding the body belt or body harness closed around the employee's body.
<i>Competent Person</i>	One who is capable of identifying existing and predictable hazards in the surroundings, or working conditions which are unsanitary, hazardous, or dangerous to employees, and who has authorization to take prompt corrective measures to eliminate them.
<i>Connector</i>	a device which is used to couple (connect) parts of the personal fall arrest system and positioning device systems together. It may be an independent component of the system, such as a carabiner, or it may be an integral component of part of the system (such as a buckle or dee-ring sewn into a body belt or body harness, or a snap-hook spliced or sewn to a lanyard or self-retracting lanyard).
<i>Controlled access zone (CAZ)</i>	an area in which certain work (e.g., overhand bricklaying) may take place without the use of guardrail systems, personal fall arrest systems, or safety net systems and access to the zone is controlled.
<i>Dangerous equipment</i>	equipment (such as pickling or galvanizing tanks, degreasing units, machinery, electrical equipment, and other units) which, as a result of form or function, may be hazardous to employees who fall onto or into such equipment.
<i>Deceleration device</i>	any mechanism, such as a rope grab, rip-stitch lanyard, specially-woven lanyard, tearing or deforming lanyards, automatic self-retracting lifelines/lanyards, etc., which serves to dissipate a substantial amount of energy during a fall arrest, or otherwise limit the energy imposed on an employee during fall arrest.
<i>Deceleration distance</i>	the additional vertical distance a falling employee travels, excluding lifeline elongation and free fall distance, before stopping, from the point at which the deceleration device begins to operate. It is measured as the distance between the location of an employee's body belt or body harness attachment point at the moment of activation (at the onset of fall arrest forces) of the deceleration device during a fall, and the location of that attachment point after the employee comes to a full stop.

<i>Equivalent</i>	alternative designs, materials, or methods to protect against a hazard which the employer can demonstrate will provide an equal or greater degree of safety for employees than the methods, materials or designs specified in the standard.
<i>Failure</i>	load refusal, breakage, or separation of component parts. Load refusal is the point where the ultimate strength is exceeded.
<i>Free fall</i>	the act of falling before a personal fall arrest system begins to apply force to arrest the fall.
<i>Free fall distance</i>	the vertical displacement of the fall arrest attachment point on the employee's body belt or body harness between onset of the fall and just before the system begins to apply force to arrest the fall. This distance excludes deceleration distance, and lifeline/lanyard elongation, but includes any deceleration device slide distance or self-retracting lifeline/lanyard extension before they operate and fall arrest forces occur.
<i>Guardrail system</i>	a barrier erected to prevent employees from falling to lower levels.
<i>Hole</i>	a gap or void 2 inches (5.1 cm) or more in its least dimension, in a floor, roof, or other walking/working surface.
<i>Infeasible</i>	that it is impossible to perform the construction work using a conventional fall protection system (i.e., guardrail system, safety net system, or personal fall arrest system) or that it is technologically impossible to use any one of these systems to provide fall protection.
<i>Lanyard</i>	a flexible line of rope, wire rope, or strap which generally has a connector at each end for connecting the body belt or body harness to a deceleration device, lifeline, or anchorage.
<i>Leading edge</i>	the edge of a floor, roof, or formwork for a floor or other walking/working surface (such as the deck) which changes location as additional floor, roof, decking, or formwork sections are placed, formed, or constructed. A leading edge is considered to be an "unprotected side and edge" during periods when it is not actively and continuously under construction.
<i>Lifeline</i>	a component consisting of a flexible line for connection to an anchorage at one end to hang vertically (vertical lifeline), or for connection to anchorages at both ends to stretch horizontally (horizontal lifeline), and which serves as a means for connecting other components of a personal fall arrest system to the anchorage.
<i>Low-slope roof</i>	a roof having a slope less than or equal to 4 in 12 (vertical to horizontal).
<i>Lower levels</i>	those areas or surfaces to which an employee can fall. Such areas or surfaces include, but are not limited to, ground levels, floors, platforms, ramps, runways, excavations, pits, tanks, material, water, equipment,

	structures, or portions thereof.
<i>Mechanical equipment</i>	all motor or human propelled wheeled equipment used for roofing work, except wheelbarrows and mopcars.
<i>Opening</i>	a gap or void 30 inches (76 cm) or more high and 18 inches (48 cm) or more wide, in a wall or partition, through which employees can fall to a lower level.
<i>Overhand bricklaying and related work</i>	the process of laying bricks and masonry units such that the surface of the wall to be jointed is on the opposite side of the wall from the mason, requiring the mason to lean over the wall to complete the work. Related work includes mason tending and electrical installation incorporated into the brick wall during the overhand bricklaying process.
<i>Personal fall arrest system</i>	a system used to arrest an employee in a fall from a working level. It consists of an anchorage, connectors, a body belt or body harness and may include a lanyard, deceleration device, lifeline, or suitable combinations of these. As of January 1, 1998, the use of a body belt for fall arrest is prohibited.
<i>Positioning device system</i>	a body belt or body harness system rigged to allow an employee to be supported on an elevated vertical surface, such as a wall, and work with both hands free while leaning.
<i>Rope grab</i>	a deceleration device which travels on a lifeline and automatically, by friction, engages the lifeline and locks so as to arrest the fall of an employee. A rope grab usually employs the principle of inertial locking, cam/level locking, or both.
<i>Roof</i>	the exterior surface on the top of a building. This does not include floors or formwork which, because a building has not been completed, temporarily become the top surface of a building.
<i>Roofing work</i>	the hoisting, storage, application, and removal of roofing materials and equipment, including related insulation, sheet metal, and vapor barrier work, but not including the construction of the roof deck.
<i>Safety-monitoring system</i>	a safety system in which a competent person is responsible for recognizing and warning employees of fall hazards.
<i>Self-retracting lifeline/lanyard</i>	a deceleration device containing a drum-wound line which can be slowly extracted from, or retracted onto, the drum under slight tension during normal employee movement, and which, after onset of a fall, automatically locks the drum and arrests the fall.

ACRONYMS

CFR	Code of Federal Regulations
ft	Foot (feet)
H&S	Health and Safety
HS&E	Health, Safety, and Environmental
HSD	Health and Safety Director
HSP	Health and Safety Procedure
HSF	Health and Safety Form
lb	Pound
NWI	North Wind, Inc.
OSHA	Occupational Safety and Health Administration
PM	Project Manager
SS	Site Supervisor
SSO	Site Safety Officer

1. PURPOSE

The purpose of this procedure is to set forth requirements and criteria for fall protection in construction workplaces covered under 29 CFR part 1926, Subpart M, “Fall Protection.” This procedure establishes requirements designed to protect workers against fall hazards and the associated risk of personnel injury.

2. SCOPE

This procedure provides information regarding fall hazards during construction and general industry activities. North Wind, Inc. (NWI) employees who are exposed to fall hazards must take precautions to avoid these hazards and be aware of fall protection safe work practices and regulatory requirements.

This procedure applies to NWI employees and subcontractors who conduct construction activities with fall hazards. The Subcontractors responsibilities are expressly defined through the subcontract terms and conditions, and NWI's Health and Safety (H&S) practices in the field are determined based on these defined responsibilities.

Stricter requirements may be imposed by subcontractors upon their employees or sub-tier contractors. The requirements of this procedure shall be followed by subcontractors, however, the means of implementation may vary as determined by the subcontractor.

With approval from the NWI Health and Safety Director (HSD), this procedure may not apply when making inspections, investigations, or assessments of workplace conditions before work begins or after work has been completed.

Fall protection requirements for the following activities are not covered by this procedure:

- Working from stairways and ladders
- Working from aerial lifts
- Steel-erecting activities
- Working from scaffolding.

3. RESPONSIBILITIES

3.1 Corporate Health and Safety Director

- Discusses concerns raised by the users of this procedure and taking appropriate actions to ensure the effectiveness of this procedure

- Approves personnel to serve in the role of fall protection competent person
- Works with North Wind site supervisors (SS), site safety officer (SSO), and fall protection competent persons to ensure this procedure is properly implemented when required
- Reviews Occupational Safety and Health Administration (OSHA) requirements and incorporating changes and requirements into this procedure
- Reviews the effectiveness of this procedure on an annual basis.

3.2 Site Supervisor

- Ensures a fall protection competent person is assigned to the project where fall hazards are present.
- Submits subcontractor fall protection plans, procedures and forms to the competent person and NWI HSD for approval prior to initiating field projects.
- Consults with the competent person to identifying fall hazards and determining fall protection system requirements
- Suspends operations when a subcontractor is not following their fall protection procedures
- Contacts the HSD and Project Manager (PM) if the subcontractor is not following their fall protection procedures.

3.3 Site Safety Officer

- Completes a Project Fall Protection Evaluation Form (HSF-014.1, Appendix A) for each project to document fall hazards.
- Serves as the fall protection competent person where qualified
- Supports the competent person with implementation of fall hazard mitigation requirements
- Provides field oversight of subcontractors performing tasks requiring fall protection systems, and completing the self-assessment checklist (HSF-014.2, Appendix D)

3.4 Fall Protection Competent Person

The HSD approved SSO shall act as NWI's fall protection competent person unless this responsibility is delegated to a more knowledgeable field staff member.

Subcontractors whose personnel are exposed to fall hazards shall provide a competent person to inspect and oversee all fall protection systems. The competent person shall have knowledge of fall protection systems and the requirements of OSHA fall protection standards. The competent person shall be capable of identifying fall hazards and have the authority to take corrective actions to eliminate these hazards.

When subcontractors use horizontal lifelines as fall protection, such lifelines shall be designed, installed, and used under the supervision of a qualified person. The qualified person shall have extensive knowledge, training, and experience in the use of horizontal lifelines, or shall be a registered professional engineer.

3.5 Subcontractors

All subcontractors conducting activities with fall hazards will be responsible for submitting a fall protection procedure to NWI for approval. The “Subcontractor Safety Procedure Criteria - Fall Protection” found in Appendix C provides the minimum criteria for a fall protection safety procedure. These criteria shall be used by the HSD or designee in reviewing subcontractor fall protection procedures submitted when NWI oversight is required.

4. TRAINING

NWI employees exposed to fall hazards are required to complete initial fall protection training. This training provides a general discussion of fall hazards and protective system requirements as outlined in Appendix B, “Fall Protection Training Requirements.” This training may be provided by the project SSO or fall protection competent person, through the computer-based fall protection training or a OSHA 10-Hour Construction Safety training course.

NWI employees exposed to fall hazards are also required to complete project-specific fall protection training. This training provides a discussion of the specific project fall hazards and the fall protection systems and equipment to be used on the project. The training is provided by the SSO using the “Project Fall Protection Evaluation Form” (HSPF-11-014.1).

Subcontractors who are exposed to fall hazards are responsible for complying with all applicable H&S training requirements and for providing the training necessary to complete their tasks safely.

5. FALL PROTECTION

The following subsections provide the minimum project operating requirements that will be used at every project site where fall hazard exist. Subcontractors are responsible and accountable for implementing these requirements as well as requirements established in their own safety procedures.

North Wind's project SSO (or SS serving as the SSO) may be required to provide oversight of a subcontractor. The following subsections are provided to inform the SSO of established regulations and industry standards so that an appropriate level of oversight may be provided. Subcontractors retain control over their practices, and North Wind's oversight does not relieve them of their own responsibility for effective implementation and enforcement of H&S requirements.

5.1 Planning Activities

Potential fall hazards and the fall protection system(s) to be used must be identified so that appropriate fall protection equipment can be provided to the project staff prior to fall exposure.

Subcontractor training shall be verified prior to the start of field operations.

5.2 Safe Work Practices

The requirements of this section are to be followed by NWI employees who are exposed to fall hazards, regardless of the company controlling the walking or working surface. These requirements also pertain to subcontractor personnel who are exposed to fall hazards when NWI is providing oversight.

- Fall protection systems shall be used to eliminate fall hazards of 6 feet or greater when performing construction activities, and fall hazards of 4 feet or greater when performing general industry activities.
- Personnel shall be aware of, and follow all requirements established by the competent person for the use and limitation of fall protection systems.
- Personal fall arrest systems shall be inspected prior to each use. Personnel shall not use damaged fall protection systems at any time, or for any reason.
- Personnel shall remain within the guardrail system when provided. Leaning over or stepping across a guardrail system is not permitted.
- Specific fall protection systems shall be constructed and used in accordance with the requirements of Section 5.3.

5.3 Regulatory and Industry Standards

This section provides the minimum regulatory and industry standard requirements pertaining to fall protection. Section 5.3.1 identifies the surfaces and activities requiring fall protection and provides the fall protection system options available for each. Sections 5.3.2 through 5.3.10 provide the minimum criteria for each fall protection system. NWI

personnel who are exposed to fall hazards shall be protected by appropriate fall protection systems.

This section is also provided to inform the SSO or NWI competent person of established fall protection regulations and industry standards so that an appropriate level of oversight may be provided. Subcontractors retain control over their practices and are responsible and accountable for implementing these requirements as well as requirements established in their own safety procedures. NWI's oversight does not relieve subcontractors of their own responsibility for effective implementation and enforcement of H&S requirements.

5.3.1 Surfaces and Activities Requiring Fall Protection

The following surfaces and activities require that fall protection systems be provided when the walking or working surface is 6 feet or greater above lower levels when performing construction activities, and 4 feet or greater when performing general industry activities.

- **Unprotected sides and edges.** Personnel exposed to sides or edges of a walking or working surface where there is no wall or guardrail system at least 39 inches high shall be protected by a guardrail system, safety net system, or personal fall arrest system.
- **Leading edges.** Personnel exposed to an edge of a walking or working surface under construction that changes location as additional materials are placed or constructed shall be protected by a guardrail system, safety net system, personal fall arrest system, or fall protection plan.
- **Holes.** Any gap or void 2 inches or more in its least dimension, in a walking or working surface shall be provided with a cover, guardrail system, or personal fall arrest system.
- **Wall openings.** Personnel working near wall openings 30 inches or more high and 18 inches or more wide, that have a bottom edge to walking or working surface height of less than 39 inches shall be protected by a guardrail system, a safety net system, or a personal fall arrest system.
- **Ramps, runways, and other walkways.** Ramps, runways, and other walkways shall be provided with a guardrail system.
- **Hoist areas.** Hoist openings shall be provided with a guardrail system or personal fall arrest system. When guardrails are removed and personnel must lean out over the edge of the access opening, they shall be protected by a personal fall arrest system.
- **Excavations.** Edges of excavations that are not readily seen because of visual barriers shall be provided with a guardrail system, fence, or barricade.

- **Wells, pits, shafts, and similar excavations.** Wells, pits, shafts, and similar excavations shall be provided with a guardrail system, fence, barricade, or cover.
- **Dangerous equipment.** Equipment that may be hazardous if personnel fall onto or into it shall be provided with a guardrail system, safety net system, or personal fall arrest system. If the fall is less than 6 feet, guardrail systems or equipment guards may be used.
- **Formwork or reinforcing steel work.** Personnel performing these activities shall be protected by a safety net system, personal fall arrest system, or positioning-device system.
- **Precast concrete erection** Personnel erecting precast concrete members, or performing related activities such as grouting concrete members, shall be protected by a guardrail system, safety net system, personal fall arrest system, or fall protection plan.
- **Overhand bricklaying.** Personnel that, while constructing masonry walls, must lean over the wall to complete the work shall be protected by a guardrail system, safety net system, personal fall arrest system, or controlled access zone.
- **Roofing work on low-slope roofs.** Personnel performing roofing work on a roof having a slope less than or equal to 4 in 12 (vertical to horizontal) shall be protected by a guardrail system, safety net system, personal fall arrest system, or combination of a warning line system and safety monitoring system. Safety monitoring systems alone may be used for roofs 50 feet or less in width.
- **Steep roofs.** Personnel working from a roof having a slope greater than 4 to 12 (vertical to horizontal) shall be protected by a guardrail system with toeboards, safety net system, or personal fall arrest system.
- **Residential construction.** Personnel performing residential construction activities shall be protected by a guardrail system, safety net system, personal fall arrest system or fall protection plan.
- **Walking or working surfaces not otherwise addressed.** Personnel exposed to falls from surfaces not specifically addressed shall be protected by a guardrail system, safety net system, or personal fall arrest system. Fall protection systems are not required for work performed from ladders, vehicles, or trailers.

5.3.2 Guardrail Systems

Guardrail systems shall be constructed and used as follows:

VERIFY THAT THIS IS THE CORRECT VERSION BEFORE USE

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- Top-edge height of top rails shall be 39 to 45 inches above the walking or working level.
- Midrails, screens, mesh, intermediate vertical members, or equivalent intermediate structural members shall be installed between the top rail and the walking or working surface.
 - Midrails shall be installed at a height midway between the top rail and the walking or working level.
 - Screens and mesh shall extend from the top rail to the walking or working level and along the entire opening between posts.
 - Intermediate members (such as balusters) shall be not more than 19 inches apart.
 - Other structural members (such as additional midrails and architectural panels) shall be installed such that there are no openings in the guardrail system that are more than 19 inches wide.
- Wood guardrails shall be constructed with 1500 lb-ft/in fiber (stress grade) construction grade lumber at a minimum. Top rails shall be 2-inch by 4-inch lumber. Intermediate rails shall be 1-inch by 6-inch lumber. Posts shall be 2-inch by 4-inch lumber spaced not more than 8 feet apart on centers. All lumber dimensions are nominal sizes.
- Pipe guardrails shall be at least one and one-half inches nominal diameter (schedule 40 pipe) with posts spaced not more than 8 feet apart on centers.
- Structural steel guardrails shall be at least 2-inch by 2-inch by 3/8-inch angles with posts spaced not more than 8 feet apart on centers.
- Guardrails constructed of materials other than wood, pipe, or structure steel as specified above, shall be subjected to a 200-pound load test. The guardrail system shall be capable of withstanding a force of at least 200 pounds applied in any outward or downward direction, at any point along the top rail. The top rail shall not deflect to a height less than 39 inches above the walking or working level.
- Manila, plastic, or synthetic rope may be used for top rails or midrails, provided it is frequently inspected and continues to meet the 200-pound load strength requirements. Steel banding and plastic banding shall not be used as top rails or midrails.
- Wire rope may be used for top rails and midrails, provided the rope is at least one-quarter inch nominal diameter and is flagged at not more than 6-foot intervals with high-visibility material.

- When guardrail systems are used around holes that are used as points of access (such as ladderways), they shall be provided with a gate, or be offset so that personnel cannot walk directly into the hole.

5.3.3 Safety Net Systems

Safety net systems shall be constructed and used as follows:

- Safety nets shall be installed as close as practicable under the walking or working surface, but in no case more than 30 feet below the surface.
- When nets are used on bridges, the potential fall area from the walking or working surface to the net shall be unobstructed.
- Safety nets shall extend outward from the edge of the work surface, based on the following vertical distances from the working level to the net:

Vertical distance from working level to the net	Minimum horizontal distance from edge of working surface to the outer edge of net
< 5 feet	8 feet
5 – 10 feet	10 feet
> 10 feet	13 feet

- Safety nets shall be capable of absorbing an impact force equal to that produced by a 400-pound drop test. The drop test shall consist of dropping a 400-pound bag of sand 30 inches in diameter into the net from 42 inches above the highest walking or working surface. The drop test shall be performed after initial installation, whenever relocated, after major repair, and at six-month intervals if left in one place.
- If it can be demonstrated that it is unreasonable to perform a drop test, a competent person shall certify that the net is in compliance with the strength and clearance requirements by preparing a certification record prior to the net being used as a fall protection system. The certification record shall include an identification of the net; the date that it was determined to be in compliance, and the signature of the competent person. The most recent certification record for each net shall be available at the jobsite.
- Safety nets shall be installed with sufficient clearance under them to prevent contact with the surface or structures below when these nets are subjected to an impact force equal to the 400-pound drop test.
- Safety nets shall be inspected at least once per week for wear, damage, and other deterioration. Defective components shall be removed from service. Safety nets shall also be inspected after any occurrence that could affect the integrity of the safety net system.

- Defective nets shall not be used.
- Materials, scrap pieces, equipment, and tools that have fallen into the safety net shall be removed as soon as possible from the net, but always before the next work shift.
- Safety net mesh openings shall not exceed 6 inches in length on any side.
- Border ropes for webbing shall have a minimum breaking strength of 5,000 pounds.
- Connections between safety net panels shall be as strong as the integral net components and shall be spaced not more than 6 inches apart.

5.3.4 Personal Fall Arrest Systems

Personal fall arrest system components shall meet or exceed the following OSHA strength criteria:

- Connectors shall be drop forged, pressed or formed steel, or made of equivalent materials, and have a smooth corrosion-resistant finish.
- Ropes and straps (webbing) used in lanyards, lifelines, and strength components of body harnesses shall be made from synthetic fibers.
- D-rings and snaphooks shall have a minimum tensile strength of 5,000 pounds and shall be proof-tested to a minimum tensile load of 3,600 pounds without cracking, breaking, or taking permanent deformation.
- Lanyards and vertical lifelines shall have a minimum breaking strength of 5,000 pounds.
- Self-retracting lifelines and lanyards shall be capable of sustaining a minimum tensile load of 3,000 pounds applied to the device with the lifeline or lanyard in the fully extended position.
- Ripstitch, tearing, and deforming lanyards shall be capable of sustaining a minimum tensile load of 5,000 pounds applied to the lanyard in the fully extended position.

Personal fall arrest systems shall be constructed and used as follows:

- Personal fall arrest systems shall be rigged such that personnel can neither free-fall more than 6 feet nor contact any lower level.
- The attachment point of the body harness shall be located in the center of the wearer's back near shoulder level, or above the wearer's head.

- Only self-locking type snaphooks shall be used.
- Horizontal lifelines shall be designed, installed, and used under the supervision of a qualified person, and must be part of a complete personal fall arrest system that maintains a safety factor of at least two.
- When vertical lifelines are used, each employee shall be attached to a separate lifeline.
- Anchorage points used for attachment of personal fall arrest equipment shall be independent of any anchorage being used to support or suspend platforms. Personal fall arrest anchorage points shall be capable of supporting at least 5,000 pounds per employee attached, or shall be designed, installed, and used as part of a complete personal fall arrest system that maintains a safety factor of at least two, and is under the supervision of a qualified person.
- Fall protection equipment and components shall be used only for fall protection and not to hoist materials.
- Personal fall arrest systems and components subjected to impact loading shall be immediately removed from service and shall not be used again for fall protection until inspected and determined by a competent person to be undamaged and suitable for reuse.
- Personal fall arrest systems shall not be attached to guardrail systems or hoists.
- Rescue support shall be provided when personnel are not capable of rescuing themselves in the event of a fall.

5.3.5 Positioning Device Systems

Positioning device systems may be used only for formwork or reinforcing steel work and shall be constructed and used as follows:

- Positioning device connectors, D-rings, and snaphooks shall meet or exceed the OSHA construction and strength criteria for personal fall arrest system components.
- Positioning device systems shall be inspected prior to each use for wear, damage, and other
- deterioration, and defective components shall be removed from service.
- Positioning devices shall be rigged such that personnel cannot free-fall more than 2 feet.

- Positioning devices shall be secured to an anchorage point capable of supporting at least twice the potential impact load of an employee's fall, or 3,000 pounds, whichever is greater.

5.3.6 Warning Line Systems

Warning line systems may be used only on low-slope roofing work, and shall be constructed and used as follows:

- Warning lines shall consist of ropes, wires, or chains positioned 34 to 39 inches from the walking or working surface, and have a minimum tensile strength of 500 pounds.
- Warning lines shall be flagged at not more than 6-foot intervals with high-visibility material.
- Warning lines shall be attached at stanchions capable of resisting a force of at least 16 pounds without tipping over.
- Warning lines shall be erected around all sides of the roof work area. When mechanical equipment is being used, the warning line shall be erected not less than 10 feet from the roof edge, perpendicular to the direction of mechanical equipment operation. When mechanical equipment is not being used, the warning line shall be erected not less than 6 feet from the roof edge.
- Points of access, materials handling areas, storage areas, and hoisting areas shall be connected to the work area by an access path formed by two warning lines. When the path to a point of access is not in use, a warning line shall be placed across the path, or the path shall be offset such that personnel cannot walk directly into the work area.
- Personnel shall not be allowed in the area between a roof edge and a warning line unless they are performing roofing work in that area, or if they are protected by another means of fall protection, such as a personal fall arrest system.

5.3.7 Controlled Access Zones

Controlled access zones may be used only for overhand bricklaying, or for leading edges, precast concrete erection, and residential construction as part of a fall protection plan.

Controlled access zones shall be constructed and used as follows:

- Control lines shall be provided that restrict access to the controlled-access zones. Only personnel engaged in the related work shall be permitted in the controlled-access zone.

- Control lines shall consist of ropes, wires, or tapes positioned 30 to 45 inches from the walking or working surface and flagged at not more than 6-foot intervals with high visibility material.
- Overhand bricklaying control lines shall be positioned 10 to 15 feet from, and parallel to, the working edge, and extend a sufficient distance to enclose all personnel performing overhand bricklaying and related work at the working edge.
- Leading-edge control lines shall be positioned 6 to 25 feet from, and parallel to, the leading edge.
- Precast-concrete-member control lines shall be positioned 6 to 60 feet, or half the length of the member being erected, whichever is less, from the leading edge.

5.3.8 Safety Monitoring System

Safety monitoring systems may be used only for low-sloped roofing in conjunction with a warning line system (or for leading edges, precast concrete erection, and residential construction as part of a fall protection plan). Safety monitoring systems shall be used as follows:

- A competent person shall be designated as a safety monitor to observe and warn personnel when it appears that they are unaware of a fall hazard, or are acting in an unsafe manner.
- The safety monitor shall be able to recognize fall hazards and shall not have other responsibilities that could distract attention from the monitoring function.
- The safety monitor shall be on the same walking or working surface, and within sight and voice communication of personnel.
- Only personnel engaged in low-slope roofing work, or personnel covered by a fall protection plan, shall be allowed in an area where a safety monitoring system is in use.
- Personnel shall adhere to the safety monitors instructions.

5.3.9 Fall Protection Plans

Fall protection plans may be used only for leading edges, precast concrete erection, and residential construction where it can be demonstrated that conventional fall protection systems (guardrails, safety nets, or personal fall arrest systems) are infeasible, or a greater hazard would be created by using them. Fall protection plans shall be used as follows:

- Fall protection plans shall be prepared by a qualified person, and developed specifically for the site work being performed.
- Fall protection plans shall be maintained and kept current, and any changes to the plan shall be approved by a qualified person.
- A copy of the fall protection plan with all approved changes shall be maintained at the job site.
- Implementation of the fall protection plan shall be under the supervision of a competent person.
- Fall protection plans shall document the reasons why the use of conventional fall protection systems are infeasible, or why their use would create a greater hazard.
- Fall protection plans shall include a written discussion of the other measures that will be taken to reduce or eliminate the fall hazard for workers who cannot be provided with protection from the conventional fall protection systems. The plan shall discuss the extent to which scaffolds, ladders, or vehicle-mounted work platforms can be used to provide a safer working surface, and thereby reduce the hazard of falling.
- Fall protection plans shall identify each location where conventional fall protection methods cannot be used, and classify those locations as controlled access zones.
- Fall protection plans shall identify the personnel who are designated to work in controlled access zones. Unidentified personnel shall not enter controlled access zones.
- Where no other alternative measure has been implemented, a safety monitoring system shall be used.

5.3.10 Covers

Covers used for fall protection shall be constructed and used as follows:

- Covers shall be capable of supporting at least twice the weight of personnel, equipment, and materials that may be imposed on the cover at any one time.
- Covers located in roadways shall be capable of supporting at least twice the maximum axle load of the largest vehicle expected to cross over the cover.
- Covers shall be secured when installed so as to prevent accidental displacement by the wind, equipment, or employees.

- Covers shall be color coded, or they shall be marked with the word "HOLE" or "COVER" to provide warning of the hazard. This requirement does not apply to manhole covers or steel grates used on streets or roadways.

5.4 Protection from Falling Objects

Falling object protection shall comply with the following provisions:

- Personnel exposed to falling objects shall be required to wear hard hats.
- Objects on elevated surfaces shall be positioned far enough away from the surface's edge to prevent those objects from falling over the edge if accidentally displaced.
- In addition to hard hats and object positioning, at least one of the following protective measures shall be implemented to prevent falling objects:
 - Erect toeboards, screens, or guardrail systems that prevent objects from falling to lower levels.
 - Erect a canopy structure to contain falling objects.
 - Barricade the area where objects could fall and prohibit entry into the barricaded area.
- Toeboards, when used as falling object protection, shall be erected along the edge of the overhead walking or working surface for a distance sufficient to protect personnel below.
- Toeboards shall be a minimum of 3-1/2 inches in height and shall have not more than a 1/4-inch clearance above the walking or working surface. They shall be solid, or have openings not over 1 inch in greatest dimension.
- Where tools, equipment, or materials are piled higher than the top edge of a toeboard, paneling or screening shall be erected from the walking or working surface or toeboard to the midrail or top rail, for a distance sufficient to protect personnel below.
- Guardrail systems, when used as falling object protection, shall have all openings small enough to prevent passage of potential falling objects.
- During the performance of overhand bricklaying work, no materials or equipment except masonry and mortar shall be stored within 4 feet of the working edge; and excess mortar, broken or scattered masonry units, and all other debris shall be kept clear from the work area by removal at regular intervals.

- During the performance of roofing work, materials and equipment shall not be stored within 6 feet of a roof edge unless guardrails are erected at the edge; and materials that are piled, grouped, or stacked near a roof edge shall be stable and self-supporting.
- Canopies, when used as falling-object protection, shall be strong enough to prevent collapse, and prevent penetration by any objects that may fall onto the canopy.

5.5 Forms/Permits

The “Project Fall Protection Evaluation Form”, found in Appendix A , is provided as a method of identifying project fall hazards and protective measures. NWI’s project SSO or competent person shall complete this form when NWI employees are exposed to fall hazards. The SSO or competent person shall then use the form to deliver project-specific fall protection training. Training shall include identifying the project fall hazards, and discussing the correct use, limitations, and inspection procedures of the fall protection system and equipment to be used on the project. Information from either the NWI HSD, the equipment manufacturer, or both should be used to provide this training.

Subcontractors may have written procedures or permits governing fall protection activities. NWI personnel using subcontractor fall protection systems must comply with these procedures and permits.

5.6 Self-Assessment Checklists

The “Health Safety and Environmental (HS&E) Self-Assessment Checklist - Excavations” found in Attachment B is provided as a method of verifying compliance with established safe work practices, regulations, and industry standards pertaining to excavation operations.

North Wind’s project competent person, SSO or SS shall use this checklist when: 1) North Wind employees enter excavations and/or 2) North Wind oversight of an excavation subcontractor is required. The HSD shall specify the frequency in which this checklist shall be completed and provide this information in the project’s written safety plan. Completed checklists shall be sent to the HSD for review. The HSD shall assist the SSO or SS in resolving any deficiencies identified during the self-assessment. This Program may be used to clarify checklist questions.

6. RECORDS

The Health and Safety Director shall maintain the following records in accordance with QAP-171, Records Control:

- Health and Safety Self Assessment Checklist – Fall Protection

7. REFERENCES

29 CFR 1926, Subpart M, “Fall Protection”

QAP-071, Records Control

APPENDIX A, Example, HSF-014, Fall Protection Evaluation Form

This form is to be completed by NWI project SSO or competent person prior to performing activities that expose NWI personnel to fall hazards.

The form is used to: 1) identify project fall hazards and determine fall protection systems available to mitigate the hazards, 2) identify personal fall arrest system equipment required, and 3) provide project-specific fall protection training. Activities and work locations must be evaluated to determine potential fall hazards. If personnel are exposed to fall hazards greater than 6' during construction activities or 4' during general industry activities, fall protection systems must be used



FALL PROTECTION EVALUATION FORM

Project Information									
Project Name: _____		Project Number: _____			Date: _____				
Scope of Work: _____		Maximum Working Height: _____							
Work Area: _____		Describe fall hazard activities: _____							
_____		_____							
Fall Hazard Determination & Fall Protection Systems									
Fall Hazard	Conventional System			Alternative Systems					
	Guardrail	Safety Net	PFAS	Cover	Positioning Device	Warning Line	Controlled Access Zone	Safety Monitoring	Fall Protection Plan
Unprotected sides & edges									
Leading Edges									1
Holes									
Wall Openings									
Ramps, runways & walkways									
Hoist areas									
Excavations									
Wells, pits & shafts									
Dangerous equipment									
Formwork & reinforced steel work									
Precast concrete erection									1
Overhead bricklaying									
Low-slope roofing work									
Steep roof									
Residential construction									1
Other surfaces									

1 - Fall protection plans may only be used if conventional systems are determined to be infeasible or would create a greater hazard. Contact NWI HSD for plan development.



FALL PROTECTION EVALUATION FORM

Personal Fall Arrest System Equipment Required					
	Full body harness		Lanyard, standard		Lifeline, horizontal
	Boatswain's chair		Lanyard, shock-absorbing		Lifeline, vertical
	Descent system		Lanyard, ripstitch		Lifeline, self-retracting
	Roze grab		Lanyard, self-retracting		Winch
Other Equipment:					
Training Requirements					
<p>The project SSO or fall protection competent person shall use this form to inform project staff of the potential fall hazards and specific fall protection systems to be used to control the hazards. SSO or competent person shall instruct affected personnel on the proper use, limitations, and inspection procedures for each fall protection component and system.</p> <p>Complete a Project Fall Protection Evaluation Form Training Signoff Sheet upon completion of training.</p>					

Instructions:

1. The Project site safety officer or fall protection competent person will complete the Fall Protection Evaluation Form based on the project or scope of work as described in HSP-11-014, Fall Protection.
2. Complete all project information and select the applicable fall hazards for the project or scope of work.
3. Select the fall protection system for each fall hazard as well as required personal fall arrest system equipment as applicable for the fall hazard(s).

Note: Only non-shaded fall protection systems can be selected

4. The SSO or fall protection competent person will then conduct training on the completed Fall Protection Evaluation Form and all training participants will sign off on the training sheet.
5. The trainee will complete the "Printed name", "Signature", and "Company Name" boxes.
6. The SSO or competent person will check the appropriate box "initial training" or "project-specific" as appropriate for the type of training conducted and then initial the "SSO or CO initials" box and fill in the date of training.

FALL PROTECTION EVALUATION FORM - TRAINING SIGNOFF SHEET

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APPENDIX B, Fall Protection Training Requirements

Fall protection training programs shall be designed to enable each employee to recognize the hazards of falling and to instruct each employee in the procedures to be followed to minimize these hazards.

1. Employees exposed to fall hazards shall receive training in the following subjects:
 - A. Review of the Project Fall Protection Evaluation Form
 - B. Correct procedures for erecting, maintaining, disassembling, and inspecting the fall protection systems to be used
 - C. Use and operation of guardrail systems, personal fall arrest systems, safety net systems, warning line systems, safety monitoring systems, controlled access zones, and other protection to be used
 - D. The role of each employee in the safety monitoring system
 - E. Limitations on the use of mechanical equipment during roofing work on low-sloped roofs
 - F. Correct procedures for the handling and storage of equipment and materials and the erection of overhead protection
 - G. The role of employees in fall protection plans
 - H. Standards contained in 29 CFR 1926, Subpart M, Fall Protection
2. Employees shall be retrained when they do not have the understanding and skills required, or changes in the workplace render previous training obsolete, or changes in fall protection systems or equipment to be used render previous training obsolete.
3. Fall protection training shall be provided by a SSO or competent person qualified in the subjects to be taught.

APPENDIX C, Subcontractor Safety Procedure Criteria - Fall Protection

The following minimum criteria are not intended to be all-inclusive, but are provided as a tool to facilitate development and review of subcontractor fall protection procedures. Subcontractors are expected to address the following items as a minimum in their safety procedures.

1. Provide the name and qualifications (years and type of experience, training background, knowledge of OSHA fall protection standard, etc.) of the “competent person” responsible for direction of fall protection activities.
2. Provide the name and qualifications (years and type of experience, training background, etc.) of the “qualified person” responsible for design, installation, and use of horizontal lifelines, when such lifelines are needed.
3. Provide the qualifications (years and type of experience, training background, etc.) of personnel assembling or using fall protection systems.
4. Provide a list of work areas and activities where fall hazards of 6 feet or greater may be encountered on this project.
5. Provide the specific fall protection system(s) (guardrails, safety nets, personal fall arrest systems, positioning devices, warning line, controlled access zone, safety monitoring, fall protection plan) to be used for each work area and activity.
6. Provide a description of how each fall protection system will be implemented during each phase of the work activities.
7. Provide a description of the components and minimum construction criteria for fall protection systems (guardrail: wood, pipe, steel, or wire, dimensions, height, spacing, strength; safety net: configuration, strength, testing; personal fall arrest: full body harness, lanyards, horizontal or vertical lifelines, anchorages, configuration, strength, limitations; etc.).
8. Provide safe work practice guidelines on use and limitations for each type of fall protection system to be used.
9. Provide a description of fall-protection inspection criteria or procedures (frequency of inspections per work shift, as needed throughout day; visual versus written inspections; items that are inspected).
10. Provide a description of methods to be used to protect personnel from falling objects from elevated surfaces (toeboards, screens, canopies, barricading area below).

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11. Provide description of safe work practices for other activities to be performed during this project (use of ladders, aerial lifts, scaffolds, personal protective equipment, etc.).

APPENDIX D, Example, HSF-014.2 Health and Safety Self Assessment Checklist



H&S SELF-ASSESSMENT CHECKLIST – FALL PROTECTION

This checklist shall be used by NWI personnel **only** and shall be completed at the frequency specified in the project's HASP, Task Hazard Analysis or by the SSO or competent person.

This checklist is to be used at locations where NWI employees or subcontractor personnel are or may be exposed to fall hazards or potential fall hazards to protect workers against fall hazards and the associated risk of personnel injury.

Project Name: _____	Project No.: _____
Location: _____	PM: _____
Auditor: _____	Title: _____
Project Fall Protection Competent Person: _____	
<p>This specific checklist has been completed to (check only one of the boxes below):</p> <input type="checkbox"/> Evaluate NWI compliance with its fall protection procedure (HSP-11-014) <input type="checkbox"/> Evaluate a NWI subcontractor's compliance with its excavation procedure or program Subcontractor's Name: _____	
<input type="checkbox"/> Check "Yes" if an assessment item is complete or correct. <input type="checkbox"/> Check "No" if an item is incomplete or deficient. Section 2 must be completed for all items checked "No." <input type="checkbox"/> Check "N/A" if an item is not applicable. <input type="checkbox"/> Check "N/O" if an item is applicable but was not observed during the assessment.	
Numbers in parentheses indicate where a description of this assessment item can be found in North Wind HSP-11-014.	

SECTION 1

	PROCEDURE AREA	Yes	No	N/A	N/O
	PERSONNEL SAFE WORK PRACTICES (5.3.1)				
1	NWI employees have completed initial fall protection training				
2	Project Fall Protection Evaluation Form completed				
3	NWI employees have complete project specific fall protection training				
4	Fall protection systems used to eliminate construction fall hazards > 6'				
5	Fall protection systems used to eliminate general industry fall hazards > 4'				
6	Personnel aware of and follow requirements established by competent person				
7	Personal fall arrest systems (PFAS) inspected prior to each use for defects				
8	Personnel remaining within guardrails, when provided				
9	Fall protection systems constructed and used according to requirements of Section 2				
	GUARDRAILS (5.2.2)				
10	Top rails positioned 39-45" above the walking/working level				
11	Midrails, screen, or other barrier between the top rail and the walking/working surface				
12	Wood construction: 2"x4" top rails, 1"x6" mid rails, and 2"x4" posts spaced every 8'				
13	Pipe construction: 1 1/2" nominal diameter with posts spaced every 8'				
14	Structural steel construction: 2"x2"x3/8" angles with posts spaced every 8'				
15	Other construction: pass a 200 lb. load test, no deflection < 39"				
16	Natural or synthetic rope top rails/midrails inspected frequently & pass 200 lb. load test				
17	Wire rope top rails/midrails > 1/4" nominal diameter and flagged every 6'				
18	Points of access (ladderways) provided with gate or offset				
	SAFETY NETS (3.2.3)				
19	Nets installed as close as practicable under the walking/working surface, < 30'				
20	Potential fall area from bridge surfaces to net unobstructed				

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H&S SELF-ASSESSMENT CHECKLIST – FALL PROTECTION

PROCEDURE AREA	Yes	No	N/A	N/O
21 Nets extend outward from the work surface based on the vertical fall distance				
22 Nets pass drop test or competent person certifies nets are in compliance				
23 Nets installed with sufficient clearance underneath to prevent contact with the surface				
24 Nets inspected at least once a week and after any occurrence that could affect its integrity				
25 Objects in net removed as soon as possible, at least before the next work shift				
26 Mesh openings < 6" in length on any side				
27 Border ropes have a minimum breaking strength of 5,000 pounds				
28 Safety net panel connections as strong as integral net components and spaced < 6" apart				
PERSONAL FALL ARREST SYSTEMS (5.2.4)				
29 PFAS components meet or exceed OSHA strength criteria				
30 PFAS rigged such that personnel can neither free-fall more than 6', nor contact any lower level				
31 Body harness back dee-ring used as attachment point				
32 Only locking type snaphooks are used				
33 Horizontal lifelines used under supervision of qualified person with safety factor of > 2				
34 When vertical lifelines are used, each employee attached to a separate life line				
35 PFAS anchorages independent of anchorages used to support or suspend platforms				
36 Anchorages capable of supporting > 5,000 lbs. per person or used under supervision of qualified person with safety factor of > 2				
37 PFAS components used only for fall protection and not to hoist materials				
38 PFAS components subjected to impact loading immediately removed from service				
39 PFAS not be attached to guardrail systems or hoists				
40 Method of rescue provided in the event of a fall				
POSITIONING DEVICES (5.2.5)				
41 Components meet or exceed OSHA PFAS construction and strength criteria				
42 Components inspected prior to each use and defective components removed from service				
43 Positioning devices rigged such that personnel cannot free-fall more than 2'				
44 Anchorages capable of supporting > 2 times potential impact load of fall or 3,000 pounds				
WARNING LINES (5.2.6)				
45 Warning lines 34-39" from the walking/working surface				
46 Warning lines flagged at < 6' intervals with high-visibility material				
47 Warning lines attached at stanchions capable of resisting 16 lb. force without tipping				
48 Warning lines erected > 6' from each roof edge				
49 Warning lines erected > 10' from roof edge perpendicular to mechanical equipment travel				
50 Warning line placed across the access points when not in use				
51 Only personnel performing roof work between a roof edge and a warning line				
CONTROLLED ACCESS ZONE (5.2.7)				
52 Control lines enclose controlled access zones				
53 Only personnel engaged in related work permitted in the controlled access zone				
54 Control lines 30-45" from the walking/working surface				
55 Control lines flagged at < 6' intervals with high-visibility material				
56 Overhand bricklaying control lines positioned 10-15' from working edge				

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H&S SELF-ASSESSMENT CHECKLIST – FALL PROTECTION

PROCEDURE AREA	Yes	No	N/A	N/O
57 Leading edge control lines positioned 6-25' from leading edge				
58 Precast concrete control lines positioned 6-60' or half the length of the erected member				
SAFETY MONITORING SYSTEM (5.2.8)				
59 Safety Monitor designated to observe and warn personnel				
60 Safety monitor not distracted from the monitoring function				
61 Safety monitor on the same working surface within sight and voice communication				
62 Only personnel necessary for work in safety monitoring zone				
63 Personnel adhere to the safety monitors instructions				
FALL PROTECTION PLAN (5.2.9)				
64 Plan prepared by qualified person and specifically for site work being performed				
65 Plan maintained current with changes approved by a qualified person				
66 Plan maintained at the job site and implemented by competent person				
67 Plan documents why fall protection systems are infeasible or would create a greater hazard				
68 Plan discusses measures taken to reduce or eliminate the fall hazards				
69 Plan discusses when scaffolds, ladders, or vehicle mounted work platforms shall be used				
70 Locations cover by plan identified and classified as controlled access zones				
71 Entry into controlled access zone limited to personnel designated in plan				
72 Safety monitoring system used when no other alternative measure implemented				
COVERS (3.2.10)				
73 Covers capable of supporting 2x the maximum weight imposed on the cover at any one time				
74 Covers secured prevent accidental displacement				
75 Covers color coded or marked "HOLE" or "COVER"				
FALLING OBJECT PROTECTION (5.3)				
76 Personnel exposed to falling objects wearing hard hats				
77 Objects on elevated surfaces position away from surface edge				
78 Toeboards, screens, guardrails, or canopies used or area barricaded below				
79 Toeboards, when used, erected along the edge of the overhead walking/working surface				
80 Toeboards 3 ½" high, < ¼" clearance above the surface, and no openings > 1"				
81 Screening/paneling provided where equipment or materials are piled above toeboards				
82 Guardrails, when used, no openings small enough to prevent passage of falling objects				
83 Overhand bricklaying masonry/mortar not stored within 4' of working edge				
84 Overhand bricklaying excess mortar, masonry units, and other debris kept clear				
85 Roofing materials not stored within 6' of a roof edge, unless guardrails are provided				
86 Roofing materials that are positioned near roof edge are stable and self-supporting				
87 Canopies, when used, strong enough to prevent collapse and penetration by falling objects				

SECTION 2

Complete this section for all items checked "No" in Section 1. Deficient items must be corrected in a timely manner.

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APPENDIX A

**SITE-SPECIFIC SAFETY AND HEALTH PLAN –
DELINEATION AND REMEDIATION OF CONTAMINATED SOIL,
GROUNDWATER, AND DEBRIS AT STRYKER BRIGADE CANTONMENT AREAS**

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APPENDIX A

**FINAL
REVISION 4**

**DELINEATION AND REMEDIATION
OF CONTAMINATED SOIL, GROUNDWATER, AND DEBRIS
AT STRYKER BRIGADE CANTONMENT AREAS**

SITE SAFETY AND HEALTH PLAN

FORT WAINWRIGHT, ALASKA

Contract No. W911KB-04-P-0136

Prepared for:



**Department of the Army
U.S. Army Corps of Engineers, Alaska District
P.O. Box 6898
Elmendorf AFB, AK 99506-6898**

Prepared by:



**235 East 8th Avenue, Suite 210
Anchorage, AK 99501**

August 2006

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**DELINEATION AND REMEDIATION OF CONTAMINATED SOIL,
GROUNDWATER AND DEBRIS AT STRYKER BRIGADE
CANTONMENT AREAS**

SITE SAFETY AND HEALTH PLAN

Fort Wainwright, Alaska



APPROVAL SIGNATURE PAGE

Plan Prepared by:

Aran Armstrong, Project Manager

Date

Plan Approved by:

Bruce Miller, CIH

Date

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ACRONYMS AND ABBREVIATIONS

ACGIH	American Conference of Government Industrial Hygienists
AHA	activity hazard analysis
APP	Accident Prevention Program
APR	air-purifying respirator
CFR	Code of Federal Regulations
CGI	combustible gas indicator
CIH	Certified Industrial Hygienist
CNS	central nervous system
CPR	cardiopulmonary resuscitation
DPW	Directorate of Public Works
eV	electrovolts
GFCI	ground fault circuit interrupter
GM	Geiger Mueller
GPS	Global Positioning System
HAZWOPER	hazardous waste operations and emergency response
HR	heart rate
HSM	Health and Safety Manager
IDLH	immediately dangerous to life and health
IP	ionization potential
JSA	job safety analysis
LEL	lower explosive limit
LO/TO	lockout/tagout
lpm	liters per minute
MEC	Munitions and explosives of concern
MSDS	material safety data sheets
NA	not applicable

ACRONYMS AND ABBREVIATIONS (Continued)

NIST	National Institute for Standards and Technology
NL	no limit found in reference materials
NWI	North Wind, Inc.
NSC	National Safety Council
OEL	occupational exposure limit
OM&M	operation, maintenance and monitoring
OSHA	Occupational Safety and Health Administration
PCBs	polychlorinated biphenyls
PEL	permissible exposure limits
PID	photoionization detector
PM	Project Manager
POC	point of contact
PPE	personal protective equipment
ppm	parts per million
SCBA	self contained breathing apparatus
SOP	standard operating procedure
SPCC	Spill prevention Control Countermeasure Plan
SSHO	Site Safety and Health Officer
SSHP/APP	Site Safety and Health Plan
STEL	short-term exposure limit
THA	task hazard analysis
TLV	Threshold Limit Value
UL	Underwriters Laboratory
USACE	U.S. Army Corps of Engineers
USAGAK	U.S. Army Garrison, Alaska
UXO	unexploded ordinance

1.0 INTRODUCTION

The U.S. Army Corps of Engineers (USACE), Alaska District has tasked North Wind, Inc. (NWI) with performing a site characterization, excavation, and remediation of contaminated media (soil, debris, water) and solid waste on and near the Stryker Brigade Cantonment Areas on Fort Wainwright, Alaska. This project is being performed under contract No. W911KB-04-P-0136.

NWI has prepared this Site Safety and Health Plan (SSHP) as an appendix to our Accident Prevention Plan (APP) to establish guidelines and practices for conducting the fieldwork to ensure the safety and health of field personnel. This APP incorporates standard operating procedures (SOPs) in the *North Wind, Inc. Corporate Health and Safety Manual*, as is supplemented with this SSHP for this specific scope of work. This SSHP and the APP has been prepared to meet the requirements from the USACE Safety and Health Requirements Manual (EM 385-1-1) and 29 CFR 1910.120, "Hazardous Waste Operations and Emergency Response."

This signed copy of the project SSHP and APP shall be kept at the project site during field activities and will be amended or revised as project activities or conditions change or when supplemental information becomes available. The Site Safety and Health Officer (SSHO) will have enforcement authority for implementation of the SSHP for all field activities. Prior to commencement of field activities, NWI personnel and subcontractors will be trained on the SSHP and part of the APP training by the SSHO. This SSHP is augmented by activity hazard analyses (AHAs), or equivalent Task Hazard Analyses or Job Safety Analyses (JSAs), for key activities. AHAs are reviewed by all field personnel as part of the APP and SSHP training.

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2.0 SITE DESCRIPTION AND CHARACTERIZATION INFORMATION

2.1 Site Description and History

A description, history, and general map of Fort Wainwright are presented in Section 2 of the APP.

The USACE is currently preparing a detailed project background and history document of this site. When completed, that document will provide a compilation of available information related to potential waste generating activities conducted previously at the site. The document will be a critical component of the overall investigation as it will support finalization of the conceptual site model and thus provides the technical basis for the investigation.

2.2 Site Characterization

New buildings and housing units are to be constructed near the Cantonment Area at Fort Wainwright in the Stryker Brigade Cantonment Areas. Several areas within the approximate 52-acre Taku Garden housing development contain contamination from past military activities in the area. This area is currently an active construction site with collocated housing construction tasks.

NWI collected samples on June 30, 2005 at Area 52 within the Taku Garden housing development area (Figure 1) under the Army Sampling Contract to evaluate disposal of soil removed during the excavation of a building foundation. Photoionization detector (PID) results collected during the initial field sampling performed by NWI indicated the presence of volatile compounds. Analytical results in samples confirmed the presence of polychlorinated biphenyls (PCBs) in both the stockpiles and excavation. Soil and ground water samples were collected for laboratory analysis as well as field screening for PCBs in 2005 throughout the Taku Garden site. The data collected during the 2006 field effort will supplement data collected in 2005 and support a future remedial investigation of the site. Most soil samples collected in 2005 were

collected from the surface of open trenches or stockpiles and at depths ranging from 0-4 feet below ground surface (bgs). Soil samples were collected to the depth of groundwater at 22 locations where soil borings were advanced using a direct push technology. Approximately 2,000 samples were collected in 2005 and a small percentage of these samples were collected at depths greater than 4-feet bgs. The highest concentration of PCBs (111,000 ppm Arclor-1260) were found in area around building 52 of the site. Other contaminants reported at much lower concentrations included diesel range organics in soil (2,810 mg/kg soil), dioxin and furans (trace concentrations in soil), and other volatile and semi-volatile organic compounds associated with debris and waste uncovered during excavation activities.

2005 field season personal and perimeter air sample results collected during intrusive site activities in the highest PCB concentration areas were reported to be below the laboratory lower detection limit of 0.02 mg/sample using NIOSH Analytical Method 5503. All previously collected wipe samples collected from the perimeter fence and adjacent housing units all were reported to have PCB levels below the detectable laboratory limit and to be less than 1 ppm/100 cm². This exposure data provides evidence that the project engineering controls (wetting, closed heavy equipment cabs, direct push sampling methods) and sampling procedures used to prevent generation of airborne dusts during soil excavation and drilling tasks were effective at controlling airborne exposures.

Other Stryker Brigade Cantonment areas that will be supported at Ft. Wainwright have the potential to contain petroleum and other contaminants from past historical military uses and may include solvents, ordinance and munitions, and well as other chemical and physical hazards.



Figure 1 Taku Garden Project Site Location.

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3.0 HAZARD AND RISK ANALYSIS

This SSHP contains a health and safety risk analysis for each major activity. The risk analysis includes activity-specific hazard controls and requirements for monitoring and protection. Any activities added to the project and not included in this plan require an approved amendment or revision to this SSHP before work on that activity begins.

3.1 Major Project Activities

NWI will function as the general/prime contractor performing oversight during all project activities conducted during this project. Table 1 lists the major project activities and associated subtasks.

3.2 Activity Hazards Analysis

AHAs (or equivalent documentation, such as a JSA) will be used to analyze each activity to be completed in this scope of work and to document the hazards and associated controls to be used to eliminate or mitigate these hazards in accordance with EM 385-1-1 and North Wind Health and Safety Procedure (HSD)-11-001, "Project Hazard Analysis." A general hazards JSA is presented in the APP and covers general work site activities common to more than one project scope of work. Attachment 2 to this SSHP contains the JSA addressing for each of the major activities included in Table 1. If the work scope changes or new hazards are encountered/identified during the course of the project, then the existing JSA will be revised to address the new hazards and then be approved by the NWI Project Health and Safety Manager (HSM) (a Certified Industrial Hygienist [CIH]). Once approved, the revised JSA will supersede the old JSA in this SSHP (Attachment 2) and all affected field personnel will be trained to it by the SSHO.

Table 1 Major Site Activities Associated with Delineation and Remediation.

Major Site Activities	Activity Subtasks
Field screening of potentially contaminated media and debris	<ul style="list-style-type: none"> ◆ Use of direct reading instruments such as PID, GM detector, groundwater monitoring instrument/probe, dust monitors, and explosivity instruments to monitor and survey potentially contaminated media that is encountered ◆ Run field assay kits for contaminants of concern
Site Characterization	<ul style="list-style-type: none"> ◆ Geophysical surveys ◆ Surface soil sampling with hand trowels and augers ◆ Power Probe direct push soil boring ◆ Hollow-stem auger drilling ◆ Split-barrel drill rig soil sampling ◆ Ground water well installation and sampling, ◆ General excavation ◆ Wipe sampling of potentially contaminated surfaces ◆ Decontamination of sampling equipment ◆ Preservation of samples
Trench and test pit excavation, stockpiling, and sampling suspected contaminated media	<ul style="list-style-type: none"> ◆ Excavation of trenches and test pits with heavy equipment ◆ Visual examination of trench and pit content ◆ Installation of liner/cover on soil stockpiles ◆ Stockpiling sampling, sorting, segregation, and all associated investigative derived waste management tasks (such as waste packaging, over packing, handling, storage, transportation, sampling, and disposal) ◆ Decontamination of sampling equipment ◆ Preservation of samples
Removal Actions	<ul style="list-style-type: none"> ◆ Characterization and excavation of contaminated soil and debris ◆ Prepare contaminated soil staging area or transport container (e.g., installing liner) ◆ Shuttle contaminated media to staging area or load transport container and ready for transport ◆ Cover staged contaminated media Waste management activities such as loading dump trucks, roll offs, rail cars, super-sacks or other containers for waste transport ◆ Moving waste containers on the installation ◆ Temporary accumulation of waste on the site and DRMO ◆ Profiling, manifesting, and shipping material and waste off site

Table 1 (continued).

Major Site Activities	Activity Subtasks
Groundwater monitoring well installation and sampling	<ul style="list-style-type: none"> ◆ Installation of groundwater well casing with direct push or other drilling method ◆ Installation of groundwater well components/systems ◆ Purging and sampling of groundwater ◆ Abandoning temporary wells ◆ Decontamination of sampling equipment ◆ Preservation of samples
Construction and Site Support Tasks	<ul style="list-style-type: none"> ◆ Construction of site storm water retention pond or basins ◆ Stockpiling, shuttling and sorting of clean soil piles ◆ Restore site with placement of clean backfill and grading ◆ Install site fencing ◆ Install and maintain site controls and signage ◆ Survey trench, pit, sample, and well locations using Global Positioning System (GPS) or land surveys ◆ Conduct miscellaneous site support tasks
MEC/UXO Support Activities	<ul style="list-style-type: none"> ◆ Standby construction support ◆ Anomaly avoidance ◆ MEC/UXO scrap removal and disposal

3.3 HAZWOPER-Regulated Activities

The following are considered 29 CFR 1910.120 HAZWOPER standard regulated tasks **when they are conducted in posted controlled areas with known or suspected contaminants** such as HTRW sites that could pose an exposure or other safety hazard:

- ◆ Field screening of potentially contaminated media (i.e., soil, groundwater, debris, and equipment) with direct reading instruments
- ◆ Surface soil and wipe sampling and subsurface soil boring sampling
- ◆ Trench and test pit excavation, stockpiling, and sampling suspected contaminated media
- ◆ Groundwater monitoring well installation and sampling
- ◆ Contaminated soil, debris or IDW sampling, handling, storage, and transport
- ◆ Construction of a storm water retention pond or basin (if in contaminated soil area)
- ◆ Fence and site control installation, surveying, site restoration, and misc. support tasks in posted contaminated areas of the site.

3.4 Non-HAZWOPER-Regulated Activities

Under specific criteria, the HAZWOPER training and medical monitoring requirements of 29 CFR 1910.120 are exempt. To meet this exemption, it must be demonstrated that personnel who enter the NWI project controlled areas will work exclusively within uncontaminated areas and will not be exposed to health or safety hazards related to hazardous waste operations. Prior approval from the NWI HSM is required for tasks where this exemption is to be applied. Table 2 presents identified non-HAZWOPER regulated tasks associated with this scope of work at Fort Wainwright.

Table 2 Non-HAZWOPER Regulated Activities.

TASKS	CONTROLS
<ul style="list-style-type: none"> ◆ Utility locate/excavation clearance in area without surface contaminants ◆ General heavy equipment work (excavation of non-contaminated areas, surface grading, grubbing, etc.) ◆ Non-contaminated waste removal/hauling ◆ Fence installation at perimeter of site ◆ Storm water retention basin construction (if conducted outside areas of known or suspected soil contamination) 	<ul style="list-style-type: none"> ◆ Briefing on site hazards, hazard mitigation and controls, limits of access, and emergency actions and procedures ◆ Posting of HAZWOPER controlled areas as appropriate (refer to Section 11 for details) ◆ Sampling and monitoring of areas to validate contaminant exposure concentrations, as appropriate (refer to Section 8)

3.5 Project Hazards and Mitigation Strategy

This section describes safe work practices, procedures, and control measures used to reduce or eliminate potential physical, chemical, and environmental hazards. It is critical that all personnel understand and follow the activity-specific requirements of this SSHP. Engineering controls, hazard isolation, specialized work practices, and the use of PPE will all be implemented to eliminate or mitigate potential hazards and exposures. However, every person on the project site must play their role in the identification and control of hazards. NWI personnel and subcontractors must remain aware of the hazards associated with each task and be proactive when conducting each task in the safest and most efficient manner. If project personnel encounter hazards assessed in this SSHP or do not understand the hazard control methods for a

specific task, they should contact the SSHO for clarification or guidance. No hazard will be left unmitigated and no personnel should engage in any project activity without a clear understanding of this mitigation strategy, including the required PPE. All applicable requirements of USACE EM 385-1-1 shall be met for each given project activity.

3.5.1 Project-Specific Hazards—Procedures for Locating Buried Utilities

Fort Wainwright Utility Mark-Out Service

Name: Vic King, Fort Wainwright Directorate of Public Works

Phone: **907-353-7139**

- ◆ Where available, obtain utility diagrams for the facility.
- ◆ Review locations of sanitary and storm sewers, electrical conduits, water supply lines, natural gas lines, and fuel tanks and lines.
- ◆ Review proposed locations of intrusive work with facility personnel knowledgeable about locations of utilities. Check locations against information from utility mark-out service.
- ◆ When uncertain about utility locations, conduct excavation or drilling of the upper depth interval manually (e.g., with shovels).
- ◆ Monitor for signs of utilities during advancement of intrusive work (e.g., sudden change in advancement of auger or split spoon).
- ◆ When the client or other on-site party is responsible for determining the presence and locations of buried utilities, the SSHO should confirm that arrangement.
- ◆ The Site Manager and SSHO will review utility locations with the appropriate field team members each day at the tailgate safety briefing based on the location of planned intrusive field activities.
- ◆ The SSHO, in coordination with the Directorate of Public Works (DPW) Utilities Locate POC, should maintain utility ground markings and locates throughout the project.

3.5.2 Project-Specific Hazards—Excavation

All excavation practices shall meet the requirements of 29 CFR 1926, Subpart P, “Excavations” and EM 385-1-1, Section 25, “Excavations,” including but not limited to:

- ◆ Conduct utility locates prior to beginning excavation operations.
- ◆ Complete Dig Clearance Form (Attachment 3).

- ◆ Complete site survey prior to staging equipment to identify all potential hazards (e.g., underground vaults, utilities, power pole, and power lines).
- ◆ Maintain minimum 20-ft clearance from power distribution lines when operating excavation equipment.
- ◆ Do not enter the excavations unless completely necessary. Enter only after the competent person has completed the daily inspection and has authorized entry and verified that all safety requirements have been met.
- ◆ Follow all excavation entry requirements established by the competent person.
- ◆ Do not enter excavations where protective systems are damaged or unstable.
- ◆ Do not enter excavations where objects or structures above the work location may become unstable and fall into the excavation.
- ◆ Do not enter excavations with the potential for a hazardous atmosphere until the air has been tested and found to be at safe levels.
- ◆ Do not enter excavations with accumulated water unless precautions have been taken to prevent excavation cave-in.

3.5.3 Project-Specific Hazards—Drilling

- ◆ Conduct utility locates prior to the start of drilling operations. Obtain and complete the required dig permit from Fort Wainwright DPW. Maintain completed Fort Wainwright utility locate/dig permit form at work site at all times.
- ◆ Review and follow NWI Power Probe Job Safety Analysis (as applicable).
- ◆ Complete a site survey prior to staging equipment to identify all potential hazards (e.g., underground vaults, utility, power pole, and power lines).
- ◆ Only authorized qualified drill operators and helpers are permitted to operate drill rigs.
- ◆ Open boreholes will be covered or barricaded when not actively being drilled.
- ◆ Verify that rig mast will not enter the 20-ft minimum clearance for overhead power distribution lines when mast is raised or rotated to facilitate directional well installation.
- ◆ Stay clear of areas surrounding drill rigs during every startup other than at the operator's startup position.
- ◆ Stay clear of the rotating augers and other rotating components of drill rigs.

- ◆ Stay as clear as possible of all hoisting operations. Loads shall not be hoisted overhead of personnel.
- ◆ Do not wear loose-fitting clothing or items such as rings or watches that could get caught in moving parts. Long hair should be restrained. Drilling personnel will be aware of body position during all material handling tasks.
- ◆ If equipment becomes electrically energized, the operator shall instruct other personnel in the immediate area not to touch any part of the equipment or attempt to touch any person who may be in contact with the electrical current. The utility company or appropriate party shall be contacted to have the line de-energized. No one will approach the equipment until it is de-energized.
- ◆ Drilling platforms and working surfaces will be kept clean of slip hazards and tripping hazards.
- ◆ Steel-toed boots, hard hats, hearing protection, and eye protection should be worn during all drilling operations.
- ◆ Smoking around drilling operations is prohibited.
- ◆ Drill rigs will be shut down and allowed to cool prior to conducting fueling operations.

3.5.4 Project-Specific Hazards—Heavy Equipment and Moving Machinery

Hazards associated with the operation of heavy equipment include injury to personnel (e.g., struck-by and caught-between hazards) and equipment and property damage. Additionally, operation of this equipment will create airborne dust. A water truck will be used during all equipment operations to wet the ground surface and minimize dust generation. All heavy equipment will be operated in the manner in which it was intended and in accordance with manufacturer’s instructions and limitations. Only authorized qualified personnel will be allowed to operate equipment, and personnel near operating heavy equipment must maintain visual communication with the operator. All heavy equipment will be inspected, operated, and maintained in accordance with 29 CFR 1926.601, “Motor Vehicles” and have rollover protection compliant with 29 CFR 1926.1000, “Rollover Protective Structures (ROPS) for Material Handling Equipment.” Equipment will be inspected by the operator prior to use each day.

Additional safe practices include the following:

- ◆ EM 385-1-1 Section 16, “Machinery and Mechanized Equipment” requirements will be followed.
- ◆ All heavy equipment will have a backup (reverse signal) alarm.
- ◆ Walking directly behind or to the side of heavy equipment without the operator’s knowledge is prohibited. All precautions will be taken before moving heavy equipment.
- ◆ While operating heavy equipment in the work area, the equipment operator will maintain communication with a designated person who will be responsible for providing direct voice contact or approved standard hand signals. In addition, all facility personnel in the immediate work area will be made aware of the equipment operations.
- ◆ All equipment will be kept out of traffic lanes and access ways and will be stored so as not to endanger personnel at any time.
- ◆ All unattended equipment will have appropriate reflectors or be barricaded if left on roadways.
- ◆ All parked equipment will have the parking brake set and chocks will be used when equipment is parked on inclines.
- ◆ The swing radius of heavy equipment cannot be entered by personnel unless performing authorized, pre-planned activities (e.g., sampling of excavation bucket). Personnel entering the swing radius of any equipment will use the following procedure:
 1. Make visual contact with the equipment operator and alert them of the intent to enter the swing radius area using hand signals or by radio communication
 2. Wait for the operator to acknowledge the signal to enter and place the equipment bucket or end effector on the ground surface in a neutral position
 3. Enter the swing radius area and conduct the required task, then exit the swing radius and signal the operator that the swing radius is clear to resume operations.

3.5.5 Project-Specific Hazards—Hoisting and Rigging

- ◆ EM 385-1-1 Section 14, “Material Handling, Storage and Disposal,” and Section 15, “Rigging” requirements will be followed.
- ◆ The operator shall comply with the manufacturer’s specifications and limitations applicable to the operation of the crane.
- ◆ Hoisting and rigging equipment will show evidence of a current inspection (e.g., tag) and be inspected by qualified personnel before use.
- ◆ Do not exceed hoist or rigging load limits. Wire rope safety factor shall be in accordance with ANSI B 30.5-1968 or SAE J959-1966.

- ◆ Belts, gears, shafts, or other reciprocating, rotating, or other moving parts or equipment shall be guarded if such parts are exposed to contact by employees, or otherwise create a hazard.
- ◆ All rigging and rigging practices shall meet the requirements of 29 CFR 1926.251, “Rigging Equipment for Material Handling.”
- ◆ The operator or designated person for mobile cranes or boom trucks will perform a visual inspection each day or before use (if the crane has not been in regular service) of items such as, but not limited to, the following:
 - All control mechanisms for maladjustment that would interfere with proper operation
 - Crane hooks and latches for deformation, cracks, and wear
 - Hydraulic systems for proper oil level
 - Lines, tanks, valves, pumps, and other parts of air or hydraulic systems for leakage
 - Hoist ropes for kinking, crushing, birdcaging, and corrosion
 - All anti-two-block, two-block warning, and two-block damage prevention systems for proper operation.
- ◆ The area around the lift (including the swing radius) will be limited to only the personnel required for the hoisting activity.
- ◆ The operator shall respond to signals from the person who is directing the lift or an appointed signal person. When a signal person is not used in the crane operation, the operator shall ensure he/she has full view of the load and the load travel paths at all times the load is rigged to the crane.
- ◆ An accessible fire extinguisher of 5BC rating, or higher, shall be available at all operator stations or cabs of equipment.
- ◆ Except for critical lifts, when these duties will be carried out by the lift supervisor, the rigger shall ensure that:
 1. The crane is level and, where necessary, blocked
 2. The load is well secured and balanced in the sling or lifting device before it is lifted more than a few inches
 3. The lift and swing path is clear of obstructions and adequate clearance is maintained from electrical sources
 4. All persons are clear of the swing radius of the counterweight.

Other applicable requirements of USACE EM 385-1-1, Section 16, “Machinery and Mechanized Equipment” will be followed with respect to hoisting and rigging operations.

3.5.6 Project-Specific Hazards—Electrical and Stored Energy

Electrical equipment and tools, as well as overhead lines and receptacles, may pose shock or electrocution hazards to personnel. Safety-related work practices will be employed to prevent electric shock or other injuries resulting from direct or indirect electrical contact. Ground-fault protected electrical circuits and receptacles, in combination with safety-related work practices, will be employed to prevent electric shock or other injuries resulting from direct or indirect electrical contact. Before conducting excavation and drilling tasks, all utilities will be located as stated in Section 8.1.

LO/TO activities are not anticipated as part of this scope of work other than for maintenance tasks, as required. Where LO/TO of a hazardous energy source is used, the source of energy will be brought to a zero energy state through the use of isolation methods in accordance with 29 CFR 1910.147, “The Control of Hazardous Energy (lockout/tagout),” EM 385-1-1 Section 12, “Control of Hazardous Energy (Lockout/Tagout),” and NWI HSP-11-012, “Control of Hazardous Energy.” In addition, the following general requirements will apply:

- ◆ Do not work on equipment when unexpected operation could result in injury unless LO/TO procedures are implemented.
- ◆ Personnel working under a LO/TO procedure must have completed the appropriate training course based on their position as an affected or authorized employee. Project-specific training may also be required on site-specific LO/TO procedures.
- ◆ Standard LO/TO procedures include the following six steps:
 1. Notify all personnel in the affected area of the LO/TO.
 2. Shut down the equipment using normal operating controls.
 3. Isolate all energy sources to the part or equipment to be worked on.
 4. Apply individual lock and tag to each energy-isolating device.
 5. Relieve or restrain all potentially hazardous, stored, or residual energy.
 6. Verify the isolation and zero energy state of the equipment. Once verified that the equipment is at the zero energy state, work may begin.
- ◆ All safeguards must be put back in place, all affected personnel notified that LO/TO has been removed, and controls positioned in the safe mode prior to LO/TO removal.

- ◆ Do not remove another person's lock or tag and never relinquish control of the key to your personal lock.

For work on energized electrical components or circuits, the following requirements apply:

- ◆ **Only qualified personnel are permitted to work on unprotected energized electrical systems.**
- ◆ Electrical wiring and equipment shall be de-energized prior to conducting work unless it can be demonstrated that de-energizing introduces additional or increased hazards or is infeasible due to equipment design or operational limitations.
- ◆ All electrical systems shall be considered energized until LO/TO procedures are implemented.
- ◆ The NWI HSD must approve all work on unprotected energized electrical systems.

3.5.7 Project-Specific Hazards—Respiratory Protection

- ◆ All requirements of NWI HSP-11-007, "Respiratory Protection" must be followed.
- ◆ Respirator users must have completed appropriate respirator training within the past 12 months. Level C training is required for air purifying respirator (APR) use and Level B training is required for supplied-air respirators and self contained breathing apparatus (SCBA) use.
- ◆ Respirator users must complete the respirator medical monitoring protocol and have been approved for the specific type of respirator to be used in accordance with 29 CFR 1910.134.
- ◆ Tight-fitting face piece respirator (negative or positive pressure) users must have passed an appropriate fit test within the past 12 months.
- ◆ Respirator use shall be limited to those activities identified in this plan. If changing site conditions alter the effectiveness of the specified respiratory protection, the HSM shall be notified to amend the written plan.
- ◆ Tight-fitting facepiece respirator users shall not have facial hair that interferes with the face-to-facepiece seal and will perform positive and negative pressure checks before each use.
- ◆ Canisters/cartridges shall be replaced according to the change-out schedule specified in this plan. Respirator users shall notify the SSHO of any detection of vapor breakthrough or breathing resistance. The SSHO shall report any breakthrough events to the HSM for schedule upgrade.
- ◆ Respirators shall be inspected before each use and during cleaning.

- ◆ Respirators in regular use shall be cleaned and disinfected as often as necessary to ensure they are maintained in a clean and sanitary condition.
- ◆ Respirators shall be properly stored to protect against contamination and deformation.
- ◆ Field repair of respirators shall be limited to routine maintenance. Defective respirators shall be removed from service.
- ◆ When breathing air is supplied by cylinder or compressor, the SSHO shall verify that the air meets Grade D air specifications.

3.5.8 Project-Specific Hazards—Fall Protection

- ◆ All fall protection equipment and practices shall meet the requirements of 29 CFR 1926 Subpart M, “Fall Protection” and NWI HSP-11-014, “Fall Protection.”
- ◆ Fall protection systems must be used to eliminate fall hazards when performing construction activities at a height of 6 ft or greater and when performing general industry activities at a height of 4 ft or greater.
- ◆ Staff exposed to fall hazards must have completed a fall protection training course and received project-specific fall protection training. Fall protection systems for which no training has been conducted shall not be used.
- ◆ The SSHO must complete the Project Fall Protection Evaluation Form and provide project-specific fall protection training to all staff exposed to fall hazards. The Project Fall Protection Evaluation Form is provided in Attachment 5.
- ◆ The SSHO shall act as competent person and shall inspect and oversee the use of fall protection systems. Follow all requirements established by the competent person for the use and limitation of fall protection systems.
- ◆ A registered professional engineer shall oversee the use of horizontal lifelines.
- ◆ Only one person shall be attached to a vertical lifeline at any given time.
- ◆ Remain within the guardrail system when provided. Leaning over or stepping across a guardrail system is not permitted.
- ◆ Do not stand on objects (e.g., boxes, buckets, bricks, or blocks) or ladders to increase working height on top of platforms protected by guardrails.
- ◆ Inspect personal fall arrest systems prior to each use. Do not use damaged fall protection systems at any time or for any reason.
- ◆ Set-up personal fall arrest systems so that you can neither free-fall more than 6 ft nor contact any lower level.

- ◆ Only attach personal fall arrest systems to anchorage points capable of supporting at least 5,000 lb.
- ◆ Use fall protection equipment for fall protection only and not to hoist materials.
- ◆ Do not use personal fall arrest systems that have been subjected to impact loading.
- ◆ Notify SSSHO immediately if a fall has taken place.

3.5.9 Project-Specific Hazards – MEC

Munitions and Explosives of Concern (MEC) may be encountered during the course of the project. MEC includes unexploded ordinance (UXO), discarded military munitions, and munitions constituents (as defined by EP 75-1-2, “Munitions and Explosives of Concern (MEC) Support During Hazardous, Toxic, and Radioactive Waste (HTRW) and Construction Activities.” Unmitigated MEC represents a significant potential hazard to personnel performing intrusive activities in areas determined to have a moderate to high potential for encountering MEC. MEC support services will be provided by a qualified UXO contractor. The project MEC Work Plan details the MEC hazards associated with this project and controls that will be used to eliminate or mitigate them during project activities. All project tasks will be performed in accordance with applicable portions of EP 75-1-2 and other applicable DOD and USACE explosive ordinance requirements.

3.5.10 General Hazards – Working and Walking Surfaces

The site has slopes, uneven terrain, debris, and will have open excavations and pits during portions of the projects that increase the likelihood for tripping or fall hazards. These hazards could result in back injuries, overexertion injuries, slips, and falls. Debris and tripping hazards will be removed or moved to the extent possible during the mobilization phase to eliminate these hazards. Personnel will use established roads and walkways to access specific areas of the site and not walk on designated traffic lanes. Tripping and slip hazards will be evaluated during the course of the project. Debris will not be allowed to accumulate on the project site.

3.5.11 General Hazards—General Practices and Housekeeping

- ◆ Site work should be performed during daylight hours whenever possible. Work conducted during hours of darkness requires enough illumination intensity to read a newspaper without difficulty.
- ◆ Good housekeeping must be maintained at all times in all project work areas.
- ◆ Common paths of travel should be established and kept free from the accumulation of materials.
- ◆ Keep access to aisles, exits, ladders, stairways, scaffolding, and emergency equipment free from obstructions.
- ◆ Provide slip-resistant surfaces, ropes, and/or other devices to be used.
- ◆ Specific areas should be designated for the proper storage of materials.
- ◆ Tools, equipment, materials, and supplies shall be stored in an orderly manner.
- ◆ As work progresses, scrap and unessential materials must be neatly stored or removed from the work area.
- ◆ Containers should be provided for collecting trash and other debris and shall be removed at regular intervals.
- ◆ Oil and grease from routine operation and maintenance activities shall be cleaned from walking and working surfaces to reduce slip hazard.
- ◆ Areas under construction and where work is being performed shall be fenced to exclude public access and a sign shall be posted with emergency contact names and numbers for both day and night hours.

3.5.12 General Hazards—Hazard Communication

The SSHO will perform the following:

- ◆ Using the Project Specific Chemical Product Hazard Communication Form (see Attachment 7), complete an inventory of chemicals brought on site.
- ◆ Confirm that an inventory of chemicals brought on site by NWI and/or subcontractors is available. A complete set of Material Safety Data Sheets (MSDSs) is found in Attachment 8.
- ◆ Request or confirm locations of MSDSs from the client, contractors, and subcontractors for chemicals to which employees are potentially exposed.

- ◆ Before or as the chemicals arrive on site, obtain an MSDS for each hazardous chemical.
- ◆ Label chemical containers with the chemical's identity and hazard warnings. Store all chemicals properly, in accordance with their MSDSs.
- ◆ Store all materials properly, giving consideration to compatibility, quantity limits, secondary containment, fire prevention, and environmental conditions.

3.5.13 General Hazards—Shipping and Transportation of Chemical Products and IDW

The U.S. Department of Transportation may define chemicals brought to the site as hazardous materials. All staff that ship the materials or transport them by road must receive training in shipping dangerous goods in accordance with 49 CFR 171, "Transportation," as applicable to project activities and shipping requirements. Trained staff must properly identify, label, pack, and document all hazardous materials that are shipped (e.g., via Federal Express) or transported by road. Contact the HSM for additional information.

3.5.14 General Hazards—Lifting

- ◆ Use mechanical lifting aids whenever possible.
- ◆ Lifting of materials will be limited to 50 lb or one-third a person's body weight, whichever is less. If a load exceeds this weight, two people or a mechanical lifting device will be used.
- ◆ Proper lifting techniques must be used when lifting any object.
- ◆ Plan storage and staging to minimize lifting or carrying distances.
- ◆ Split heavy loads into smaller loads.
- ◆ Have someone assist with lifting, especially for heavy or awkward loads.
- ◆ Make sure the path of travel is clear prior to the lift.

3.5.15 General Hazards—Fire Prevention and Protection

- ◆ Comply with all applicable requirements of EM 385-1-1 Section 9, "Fire Prevention and Protection."
- ◆ Fire extinguishers shall be provided so that the travel distance from any work area to the nearest extinguisher is less than 100 ft. When 5 gal or more of a flammable or combustible liquid is being used, an extinguisher must be within 50 ft. Extinguishers must:

1. Be maintained in a fully charged and operable condition
 2. Be visually inspected each month
 3. Undergo a maintenance check each year.
- ◆ Store flammable liquids in Underwriters Laboratory (UL) containers in well ventilated areas. Factory Mutual/Underwriters Laboratory (FM/UL)-approved flammable liquid containers, labeled with the content, will be used to store fuel.
 - ◆ All fuel containers will be stored at least 15 m (50 ft) from any facilities and ignition sources, or stored inside an approved flammable storage cabinet.
 - ◆ ABC fire extinguishers will be located in each field vehicle and on each piece of heavy equipment inside the containment area and active demolition areas.
 - ◆ Store flammable liquids in UL containers in well ventilated areas.
 - ◆ Post "NO SMOKING" signs in refueling areas and on fuel storage tanks.
 - ◆ Clear combustible materials (i.e., tall dry grasses) from vehicle and equipment parking areas.
 - ◆ Avoid parking vehicles in area of tall dry grass or other potentially combustible material.
 - ◆ Where required for hot work, inert or otherwise place in a safe condition (<10% of the LEL) potential flammable or combustible tanks or vessels.
 - ◆ Clear all areas of combustible materials prior to initiating hot work and have an extinguisher/fire watch in the area during the hot work, in accordance with the approved NWI Hot Work Permit and EM 385-1-1, Section 10, "Welding and Cutting."

3.5.16 General Hazards—Powered Hand Tools

- ◆ Comply with requirements of EM 385-1-1 Section 13, "Hand and Power Tools."
- ◆ All portable equipment and tools will be properly maintained and used according to the manufacturer's specifications by qualified individuals.
- ◆ All tools will be inspected by the "Used Prior to Use" stamp to ensure they are in good working condition, guards are in place, and cords are in good condition.
- ◆ Replace worn or damaged blades, bits, or other tool attachments before use.
- ◆ Any tool found to be damaged will be tagged and taken out of service.
- ◆ All electric tools used outdoors will have a ground-fault circuit interrupter (GFCI) protection inline.

- ◆ Loose or frayed clothing; loose, long hair; and dangling jewelry shall not be worn while working with any power tool.
- ◆ Protect all electrical equipment, tools, switches, and outlets from environmental elements.
- ◆ Extension cords must be:
 1. Equipped with third-wire grounding
 2. Covered, elevated, or protected from damage when passing through work areas
 3. Protected from pinching if routed through doorways
 4. Not fastened with staples, hung from nails, or suspended with wire.

3.5.17 General Hazards—Stairways and Ladders

- ◆ A stairway or ladder is generally required when a break in elevation of 19 in. or greater exists.
- ◆ Personnel should avoid using both hands to carry objects while on stairways. If unavoidable, use extra precautions.
- ◆ Personnel must not use pan and skeleton metal stairs until permanent or temporary treads and landings are provided for the full width and depth of each step and landing.
- ◆ Ladders must be inspected by a competent person for visible defects prior to each day's use. Defective ladders must be tagged and removed from service.
- ◆ Ladders must be used only for the purpose for which they were designed and shall not be loaded beyond their rated capacity.
- ◆ Only one person at a time shall climb on or work from an individual ladder.
- ◆ User must face the ladder when climbing, keeping belt buckle between side rails.
- ◆ Ladders shall not be moved, shifted, or extended while in use.
- ◆ User must use both hands to climb and use a rope to raise and lower equipment and materials.
- ◆ Straight and extension ladders must be tied off to prevent displacement.
- ◆ Ladders that may be displaced by work activities or traffic must be secured or barricaded.
- ◆ Portable ladders must extend at least 3 ft above landing surface.
- ◆ Straight and extension ladders must be positioned at such an angle that the ladder base to the wall is one-fourth of the working length of the ladder.

- ◆ Stepladders are to be used in the fully opened and locked position.
- ◆ Users are not to stand on the top two steps of a stepladder; nor are users to sit on top or straddle a stepladder.
- ◆ Fixed ladders 24 ft in height or taller must be provided with fall protection devices.
- ◆ Fall protection should be considered when working from extension, straight, or fixed ladders greater than 6 ft from lower levels, when both hands are needed to perform the work, or when reaching or working outside of the plane of ladder siderails.

3.5.18 General Hazards—Heat Stress

- ◆ Drink 16 oz of water before beginning work. Disposable cups and water maintained at 50 to 60°F should be available. Under severe conditions, drink 1 to 2 cups every 20 minutes, for a total of 1 to 2 gal per day. Do not use alcohol in place of water or other nonalcoholic fluids. Decrease your intake of coffee and caffeinated soft drinks during working hours.
- ◆ Acclimate yourself by slowly increasing workloads (e.g., do not begin with extremely demanding activities).
- ◆ Use cooling devices (i.e., cooling vests) to aid natural body ventilation. These devices add weight so their use should be balanced against efficiency.
- ◆ Use mobile showers or hose-down facilities to reduce body temperature and cool protective clothing.
- ◆ Conduct field activities in the early morning or evening and rotate shifts of workers, if possible.
- ◆ Avoid direct sunlight whenever possible. Working under direct sun can decrease physical efficiency and increase the probability of heat stress. Take regular breaks in a cool, shaded area.
- ◆ Provide adequate shelter/shade to protect personnel against radiant heat (i.e., sun, flames, and hot metal).
- ◆ Maintain good hygiene standards by frequently changing clothing and showering.
- ◆ Observe one another for signs of heat stress. Persons who experience signs of heat syncope, heat rash, or heat cramps should consult the SSHO to avoid progression of heat-related illness.

Table 3 presents the symptoms and treatment options of heat stress.

Table 3 Symptoms and Treatment of Heat Stress.

	Heat Syncope	Heat Rash	Heat Cramps	Heat Exhaustion	Heat Stroke
Signs and Symptoms	Sluggishness or fainting while standing erect or immobile in heat.	Profuse tiny raised red blister-like vesicles on affected areas, along with prickling sensations during heat exposure.	Painful spasms in muscles used during work (arms, legs, or abdomen); onset during or after work hours.	Fatigue, nausea, headache, giddiness; skin clammy and moist; complexion pale, muddy, or flushed; may faint on standing; rapid thready pulse and low blood pressure; oral temperature normal or low.	Red, hot, dry skin; dizziness; confusion; rapid breathing and pulse; high oral temperature.
Treatment	Remove to cooler area. Rest lying down. Increase fluid intake. Recovery is usually prompt and complete.	Use mild drying lotions and powders, and keep skin clean and prevent infection.	Remove to cooler area. Rest lying down. Increase fluid intake.	Remove to cooler area. Rest lying down, with head in low position. Administer fluids by mouth. Seek medical attention.	Cool rapidly by soaking in cool—but not cold—water. Call ambulance, and get medical attention immediately!

Monitoring Heat Stress

These procedures should be considered when the ambient air temperature exceeds 70°F, the relative humidity is greater than 50%, or when workers exhibit symptoms of heat stress. The heart rate (HR) should be measured at the radial pulse for 30 seconds, as early as possible in the resting period. The HR at the beginning of the rest period should not exceed 100 beats/minute or 20 beats/minute above resting pulse. If the HR is higher than that, the next work period should be shortened by 33%, while the length of the rest period stays the same. If the pulse rate still exceeds 100 beats/minute at the beginning of the next rest period, the work cycle should be further shortened by 33%. The procedure is continued until the rate is maintained below 100 beats/minute, or 20 beats/minute above resting pulse.

3.5.19 General Hazards—Cold Stress

- ◆ Be aware of the symptoms of cold-related disorders and wear proper, layered clothing for the anticipated fieldwork. Appropriate raingear is a must in cool weather.
- ◆ Consider monitoring the work conditions and adjusting the work schedule using guidelines developed by the U.S. Army (wind-chill index) and the National Safety Council (NSC).

- ◆ The Wind-Chill Index is used to estimate the combined effect of wind and low air temperatures on exposed skin. The wind-chill index does not take into account the body part that is exposed, the level of activity, or the amount or type of clothing worn. For those reasons, it should only be used as a guideline to warn workers when they are in a situation that can cause cold-related illnesses.
- ◆ NSC Guidelines for Work and Warm-Up Schedules can be used with the wind-chill index to estimate work and warm-up schedules for fieldwork. The guidelines are not absolute; workers should be monitored for symptoms of cold-related illnesses. If symptoms are not observed, the work duration can be increased.
- ◆ Persons who experience initial signs of immersion foot, frostbite, or hypothermia should consult the SSHO to avoid progression of cold-related illness.
- ◆ Observe one another for initial signs of cold-related disorders.
- ◆ Obtain and review weather forecast; be aware of predicted weather systems, along with sudden drops in temperature, increase in winds, and precipitation.

Table 4 presents the symptoms and treatment options of cold stress.

Table 4 Symptoms and Treatment of Cold Stress.

	Immersion (Trench) Foot	Frostbite	Hypothermia
Signs and Symptoms	Feet discolored and painful; infection and swelling present.	Blanched, white, waxy skin, but tissue resilient; tissue cold and pale.	Shivering, apathy, sleepiness; rapid drop in body temperature; glassy stare; slow pulse; slow respiration.
Treatment	Seek medical treatment immediately.	Remove victim to a warm place. Re-warm area quickly in warm—but not hot—water. Have victim drink warm fluids, but not coffee or alcohol. Do not break blisters. Elevate the injured area, and get medical attention.	Remove victim to a warm place. Have victim drink warm fluids, but not coffee or alcohol. Get medical attention.

Table 5 presents information on wind chill factors and associated preventative control measures.

Table 5 Combined Wind Chill Table and Work/Rest Controls.

Estimated Wind Speed (mph)	Actual Temperature Reading (°F)											
	50	40	30	20	10	0	-10	-20	-30	-40	-50	-60
	Equivalent Chill Temperature (°F) ¹											
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 In < 1 hr with dry skin.				INCREASING DANGER Danger from freezing of exposed flesh within 1 minute.				GREAT DANGER Flesh may freeze within 30 seconds.			
	Trenchfoot and immersion foot may occur at any point on this chart.											

Note: Based on Table 2 of the ACGIH 2005 Threshold Limit Values (TLVs), "Cold Stress."

 Equivalent chill temperature requiring dry clothing to maintain core body temperature above 36°C (96.8°F) per cold stress TLV.

3.6 General Hazards—Compressed Gas Cylinders

- ◆ Valve caps must be in place when cylinders are transported, moved, or stored.
- ◆ Cylinder valves must be closed when cylinders are not in use or during transport.
- ◆ Cylinders must be secured in an upright position at all times.
- ◆ Cylinders must be shielded from welding and cutting operations and positioned to avoid being struck or knocked over, contacting electrical circuits, or exposed to extreme heat sources.
- ◆ Cylinders must be secured on a cradle, basket, or pallet when hoisted; they may not be hoisted by choker slings.

3.6.1 Biological Hazards and Controls—Bloodborne Pathogens

Exposure to bloodborne pathogens may occur when rendering first aid or CPR, or when coming into contact with landfill waste or waste streams containing potentially infectious material. Exposure controls and PPE are required. Hepatitis B vaccination must be offered before the person participates in a task where exposure is a possibility.

3.6.2 Biological Hazards and Controls—Bees and Other Stinging Insects

Bee and other stinging insects may be encountered almost anywhere and may present a serious hazard, particularly to people who are allergic. Watch for and avoid nests. Keep exposed skin to a minimum. Carry a sting kit if you have had allergic reactions in the past, and inform the SSHO and/or buddy. If a stinger is present, remove it carefully with tweezers. Wash and disinfect the wound, cover it, and apply ice. Watch for allergic reaction and seek medical attention if a reaction develops.

3.6.3 Biological Hazards and Controls—Bears

- ◆ Avoid thick brush and other bear habitat.
- ◆ Avoid surprising bears, look for signs, and make noise (e.g., talking, singing, or whistling).
- ◆ Avoid crowding bears.

- ◆ Avoid attracting bears with food and garbage.
- ◆ If bear approaches, get in project vehicle and notify FTW safety personnel. Do not run.

3.6.4 Biological Hazards and Controls—Caribou and Moose

- ◆ Remain 100 yards away from caribou and moose.

3.6.5 Hazard Communications

The Hazard Communication program will be established for this project in accordance with NWI HSP-11-002, “Hazard Communication.” Chemicals (e.g., fuels, lubricants, or sample preservatives) will be used in support of project activities. Project personnel will be required to have an MSDS for all chemicals used in accordance 29 CFR 1910.1200, “Hazard Communication.” All chemicals entering the project must be entered into and tracked on a chemical inventory form.

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4.0 PROJECT ORGANIZATION, QUALIFICATIONS AND RESPONSIBILITIES

Project responsibilities and lines of authority are presented in Section 4 of the APP. All personnel involved with this project will follow the health and safety requirements set forth in this SSHP and the APP. The project Health and Safety Manager and Site Safety Officer positions are described further below.

4.1 Project Health and Safety Manager

The assigned project HSM is Bruce Miller who serves as the NWI Corporate H&S Director and is a Certified Industrial Hygienist (CIH) with more than 18 years of experience including 8 years of Alaska USACE-specific project experience. Responsibilities for the HSM include but are not limited to:

- ◆ Develop, maintain, and oversee implementation of the SSHP.
- ◆ Visit the project as needed to audit the effectiveness of the SSHP.
- ◆ Remain available for project emergencies.
- ◆ Develop modifications to the SSHP, as needed.
- ◆ Evaluate occupational exposure monitoring/air sampling data and adjust SSHP requirements as necessary.
- ◆ Serve as a QC staff member.
- ◆ Approve the SSHP by signature.

4.2 Site Safety and Health Officer

Each SSHP shall report directly to the North Wind's Project HSM and will have the specific training, knowledge, and experience required by EM 385-1-1 and necessary to implement the APP and associated SSHP to verify compliance with all applicable project safety and health requirements. Additional responsibilities include but are not limited to:

- ◆ Be present during cleanup operations to implement the SSHP.
- ◆ Inspect site activities to identify safety and occupational health deficiencies and correct them.
- ◆ Coordinate changes/modifications to the SSHP with the SHM, site superintendent, and contracting officer.
- ◆ Conduct project specific training.

5.0 TRAINING PROGRAM

In compliance with applicable Occupational Safety and Health Administration (OSHA) requirements (29 CFR 1910.120) and the USACE health and safety program, NWI SSHOs will have received OSHA supervisory training and will have a working familiarity with the health and safety procedures specific to hazardous waste operations, as established under 29 CFR 1926.120. Project personnel will be experienced in hazardous waste site work, use of personal protective equipment, and emergency response procedures.

5.1 Ft. Wainwright-Specific Training

Ft. Wainwright-specific information will be addressed during the APP and SSHP briefings.

5.2 HAZWOPER, APP, and SSHP Training

All site personnel entering areas of known or suspected contamination shall receive training as specified in OSHA 29 CFR 1926.120 and the requirements in USACE ER 385-1-92. Table 6 summarizes training requirements for site personnel. Specific training requirements for each worker may vary depending on the hazards or responsibilities associated with their individual job assignment, area to be accessed, and project activities.

Proof that all required training courses have been completed (including applicable refresher training) will be made available upon request. Before beginning work at the site, site-specific training will be conducted by the SSHO. This training will consist of a complete review of this SSHP with time for discussion and questions (this training may be conducted in accordance with APP training). At the time of this training, personnel training records not already on file will be checked and verified to be current and complete for all required training shown in Table 6. Upon completing site specific training, personnel will sign a NWI training acknowledgement form (Attachment 1).

Table 6 Required Site-Specific Training for Project Personnel.

Training	PM, Field Manager, SSHO, UXO Techs, Samplers	Other Field Team Members and Subs.	Construction Personnel Requiring Access into Known Contaminated areas	Visitor Limited to Support Zone and Uncontaminated Areas
40-hr or 24-hr HAZWOPER and 8-hr Refresher	X	A	A	—
8-hr HAZWOPER Supervisor	B	—	—	—
APP/SSHP	X	X	X	Briefing on site hazards, controls, and emergency actions
CPR/First Aid	B	B	—	—
Crane/Hoist Operators and Riggers	—	C	—	—
Equipment Operator	—	D	—	—
PPE Training	E	E	E	—
Respirator Training (with quantitative fit test and medical evaluation)	F	F	—	—
Fire Extinguisher Training	X	X	—	—
UXO Technician II or III	G	—	—	—
UXO/MEC awareness training	H	H	I	I
<p>X = Training required.</p> <p>A = Only required for activities in known or suspected contaminated areas. Determination as to 24-hr or 40-hr requirement will be made based on tasks to be performed and contaminated areas to be entered. 40-hr or 24-hr training must include 24-hr or 8-hr (respectively) of supervised field experience IAW 29 CFR 1910.120.</p> <p>B = Minimum of one HAZWOPER Supervisor and one CPR/first aid trained person on site at all times during site operations.</p> <p>C = Crane operator must meet requirements for USACE crane operator per EM 385-1-1 Appendix G.</p> <p>D = Must be designated and qualified by employer for the equipment prior to operation.</p> <p>E = Prior to donning or using any PPE personnel shall be trained in proper use, inspection, donning, care, maintenance limitations, and storage of the PPE IAW 29 CFR 1910.132.</p> <p>F = Based on areas to be accessed and task to be performed. SSHO and HSM to determine respirator type and cartridge. Includes training, medical exam, and fit test for air purifying respirator (APR) as needed based on hazards.</p> <p>G = Training IAW EP 75-1-2 and ER 1110-1-8153 for type of work performed and position filled</p> <p>H = Training to the project MEC/UXO work plan as part of the APP/SSHP training.</p> <p>I = As required by the assigned UXO escort for UXO/MEC recognition and avoidance.</p>				

5.3 Safety Meeting, Feedback, and Lessons Learned

A daily safety meeting or equivalent will be conducted by the FM or designee. During this meeting, daily tasks are to be outlined; hazards identified; hazard controls, mitigation, and work zones established; PPE requirements discussed; and feedback from personnel solicited. At the end of this meeting, any new work-control documents will be reviewed and signed.

Particular emphasis will be placed on lessons learned from the previous workday's activities and how tasks can be completed in the safest, most efficient manner. All personnel are encouraged to contribute ideas to enhance worker safety and mitigate exposures to hazards at the project sites. This training will be documented daily on a NWI Tailgate Safety Briefing form or equivalent.

5.4 Other Safety Training

Health and safety topic-specific training or safety meetings can also be held during the course of the project to reinforce key safety topics. These meetings can be conducted by assigned project health and safety professionals or any field team member and should be held in conjunction with the safety meeting. Section 6 of the APP addresses other training requirements.

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6.0 PERSONAL PROTECTIVE EQUIPMENT

The NWI shall provide all field team personnel with appropriate PPE and protective clothing and shall ensure that all PPE and protective clothing is kept clean and well maintained. Initially, all field personnel shall wear Level D protective clothing and PPE at project site during nonintrusive activities outside known or suspected contaminated areas. Protective clothing and safety equipment requirements are summarized in Table 7.

6.1 Respiratory Protection

The primary objective will be to prevent or significantly reduce levels of atmospheric contamination (i.e., air contaminated with harmful dusts, fumes, mists, gases, smokes or vapors) to prevent inhalation of potential toxic substances. This will be accomplished as far as feasible through the implementation of existing project engineering controls (e.g., wetting contaminated soils before excavation or movement, closed cabs), administrative controls, and use of respiratory protection as required. When effective engineering controls are not feasible or entry into the areas with airborne contaminants in excess of the actions limits, the appropriate type of respiratory protection will be selected and worn.

All personnel required to wear respirators shall complete training and be fit-tested before being assigned a respirator. Requirements for respirator use, emergency use, storage, cleaning, and maintenance, as stated in NWI HSP-11-007, "Respiratory Protection" shall be followed.

6.2 Personal Protective Equipment Levels

The following subsections provide general guidance on typical HAZWOPER levels of PPE. Project activities will be evaluated continually to determine the most appropriate PPE during the course of the project. Additional PPE requirements may be specified in AHA (JSA).

Table 7 Required Protective Clothing and Safety Equipment.

Level	Protective Clothing	Safety Equipment
D	<ul style="list-style-type: none"> ◆ Work clothing - Long pants, sleeved shirt ◆ Safety-toed boots (ANSI Z41) ◆ Safety glasses or goggles (ANZI Z87.1) ◆ Hard hat (ANZI Z89.1) in active construction areas and where overhead or bump hazards exist ◆ Hearing protection (as required if >85 dBA) ◆ High visibility reflective vests ◆ Gloves (leather for material handling or material as specified by the SSHO for contaminants) <p><u>Allowable Level D Modifications:</u></p> <ul style="list-style-type: none"> ◆ Tyvek^a coveralls ◆ Chemically resistant gloves ◆ Chemical boots or booties ◆ Specialized PPE (e.g., face shield, chemical apron, etc.) 	<p>Direct reading instruments</p> <p>Magnetometers (MEC)</p> <p>Eyewash station</p> <p>Decontamination equipment</p> <p>First aid kit/fire extinguishers</p>
C	<p><u>Level D PPE with the addition of:</u></p> <ul style="list-style-type: none"> ◆ APR, full- or half-face, with HEPA^b or HEPA/OV combination cartridges ◆ Tyvek^a or other chemically resistant coveralls (with hood) ◆ Nitrile butyl rubber outer gloves (or vinyl outer gloves, depending on the contaminant of concern – SSHO to specify) ◆ (Safety glasses not required if wearing a full-face respirator) 	<p>Direct reading instruments</p> <p>Magnetometers (MEC)</p> <p>Eyewash station</p> <p>Decontamination equipment</p> <p>First aid kit/fire extinguishers</p>
B	<p><u>Level C Protective clothing and 1 of the following supplied air options:</u></p> <ul style="list-style-type: none"> ◆ An air hood operating at a minimum pressure of 6 cfm ◆ Full facepiece supplied air respirator (with a 10-minute escape bottle if IDLH or an escape air-purifying combination HEPA or chemical cartridge). Supplied air respirator hose length no more than manufacturer’s specification and, under no circumstances, greater than 300 ft. ◆ Self-contained breathing apparatus (SCBA) ◆ Chemically resistant coveralls such as Tyvek QC, Tychem or Saranex. 	<p>Direct reading instruments</p> <p>Magnetometers (MEC)</p> <p>Eyewash station</p> <p>Decontamination equipment</p> <p>First aid kit/fire extinguishers</p>

a. Or equivalent chemical protective clothing.

b. 99.97% efficient against particles of 0.3 μ size or larger. SSHO to determine cartridge type and changeout schedule in conjunction with project HSM (CIH).

APR = air purifying respirator

cfm = cubic feet per minute

CIH = certified industrial hygienist

HEPA = high efficiency particulate air

HSM – health and safety manager

MEC = munitions and explosives of concern

Table 8 lists PPE requirements for the levels of PPE that are anticipated to be worn during the course of the project. Modifications to these levels will be made under the direction of the SSHO in consultation with the project HSM. Such modifications are routinely employed during HAZWOPER site activities to maximize efficiency and to meet site-specific needs without compromising personnel safety and health. Table 8 lists the initial level of PPE anticipated for each project activity with the corresponding upgrade or downgrade based on site-specific conditions and monitoring results.

The SSHO may upgrade PPE from Level D to Level C or B and downgrade from based upon actual field conditions and airborne exposure monitoring. The SSHO will stop work immediately if PPE upgrading is required in order to implement the necessary PPE changes. Level B PPE is provided as a contingency for site with unknown hazards or airborne hazards exceeding the protection factor of air purifying respirators. If immediately dangerous to life or health (IDLH) or airborne concentrations exceeding the Level C respiratory protection factor are encountered, the work are will be placed in a secure configuration and work halted until the project HSM (CIH) is consulted to provide specific PPE requirements.

The SSHO is responsible for ensuring that all personnel wear appropriate protective equipment. The project HSM will be consulted with any questions related to PPE degradation and when establishing a cartridge change-out schedule if Level C respiratory protection is required.

6.3 Level D Personal Protective Equipment

Level D PPE will only be selected for protective clothing and not on a site with respiratory or skin absorption hazards requiring whole-body protection. Level D PPE provides no protection against airborne chemical hazards, but rather is used for protection against surface contamination and physical hazards. Level D PPE will only be allowed in areas that have been characterized as having limited contamination hazards.

Table 8 Activity-Based Personal Protective Equipment Requirements and Modifications.

Activity	Initial Level of PPE	PPE Upgrade Contingency	PPE Downgrade Contingency	PPE Upgrade or Downgrade Criteria	PPE Modifications and Comments
<ul style="list-style-type: none"> ◆ Mob/Demob, Site Construction and Support in uncontaminated areas ◆ Geophysical surveys and utility locate/excavation clearance in area without surface contaminants ◆ General heavy equipment work (excavation of non-contaminated areas, surface grading, grubbing, etc.) ◆ Non-contaminated waste removal/hauling ◆ Fence installation at perimeter of site ◆ Storm water retention basin construction (if conducted outside areas of known or suspected soil contamination) ◆ Trench and test pit excavation ◆ Clean stockpiled soil sorting for MEC ◆ Field assay kit analysis 	D	D+/C	N/A	<p>Upgrade to Level D+ when working in or with contamination media or in PCB exclusion zone area.</p> <p>If drums or other potentially hazardous waste is encountered during trenching operations, upgrade to D+ prior to bringing materials to the surface. Monitor with PID and other applicable monitors.</p> <p>Upgrade to Level C for all hazardous waste handling and sampling tasks</p>	<p>Level D+ protective clothing consists of nitrile gloves, shoe covers, and Tyvek coveralls (or equivalent) as directed by SSHO.</p> <p>Leather gloves for all material handling tasks.</p> <p>Hearing protection in areas where noise level exceed 84 dBA.</p> <p>Nitrile gloves and adequate ventilation for handling of bagged soil during field assay kit analysis.</p>

Activity	Initial Level of PPE	PPE Upgrade Contingency	PPE Downgrade Contingency	PPE Upgrade or Downgrade Criteria	PPE Modifications and Comments
<ul style="list-style-type: none"> ◆ Stockpiling, sampling, loading of known or suspected contaminated media ◆ Soil/groundwater sampling and drilling/installing groundwater wells in areas with known or potential contamination ◆ Stockpiled soil sorting for MEC in suspected contamination areas 	D+	C	N/A	Upgrade to level C if airborne monitoring exceeds action limit or sampling results show concentrations above TLV.	<p>Level C protective clothing consists of nitrile gloves, shoe covers, and hooded Tyvek coveralls (or equivalent) as directed by SSHO.</p> <p>Level C respiratory protection as described in Table 8.</p>
<ul style="list-style-type: none"> ◆ Hazardous waste drum handling, overpacking, sampling and ◆ Trenching operations involving removal of buried drums or other suspected hazardous waste. 	C	C+	D+	Upgrade to Level C+ protective clothing contact with liquids during drum or overpacking tasks is likely.	<p>Level C/D+ protective clothing consists of Tyvek (or equivalent) hooded coverall.</p> <p>Level C+ protective clothing consists of Tyvek QC, Tychem or Saranex (or equivalent coated, hooded coverall).</p> <p>Double pair nitrile gloves during decontamination tasks.</p> <p>Leather gloves over nitrile for damaged drum handling.</p> <p>Leather gloves for all other material handling tasks.</p> <p>Level C respiratory protection as defined in Table 8.</p>
<ul style="list-style-type: none"> ◆ Sampling of locations with hazardous materials presenting a potential IDLH hazard 	B	N/A	C+	Downgrade to Level C APR if air sampling demonstrates airborne concentration with full-face APR protection factor.	<p>Level B protective clothing per Table 8</p> <p>Level B and Level C respiratory protection per Table 8</p>

6.4 Level C Personal Protective Equipment

Level C PPE will be worn when the task site (chemical or radioactive) contaminants have been well-characterized indicating that personnel are protected from airborne exposures by wearing an air-purifying respirator with the appropriate cartridges, no oxygen-deficient environments exist (less than 19.5% at sea level), and that there are no conditions that pose immediate danger to life or health (IDLH).

6.5 Personal Protective Clothing Upgrading and Downgrading

The project HSO, in consultation with the project IH (and RadCon personnel), will be responsible for determining when to upgrade or downgrade PPE requirements. Upgrading or downgrading of PPE based on changing site conditions or activities is a normal occurrence. Reasons for upgrading or downgrading are listed in the following subsections.

NOTE: *Personnel must inspect all PPE before donning and entry into any contaminated area. Items found to be defective or that become unserviceable during use, will be doffed and disposed of in accordance with posted procedures and placed into the appropriate waste stream. The PPE inspection guidance is provided in Table 9.*

6.5.1 Upgrading Criteria for Personal Protective Equipment

The level of PPE required will be upgraded for the following reasons and work will halt until PPE upgrading has been completed:

- ◆ Identification of new, unstable, or unpredictable site hazards
- ◆ Temporary loss or failure of any engineering controls
- ◆ Contaminants that present difficulty in monitoring or detecting
- ◆ Known or suspected presence of skin absorption hazards
- ◆ Identified source or potential source of respiratory hazard(s) not anticipated
- ◆ Change in the task procedure that may result in an increased contact with contaminants or meeting any of the criteria listed above.

6.5.2 Downgrading Criteria

The level of PPE will be downgraded under the following conditions:

- ◆ Elimination of hazard or completion of task(s) requiring specific PPE
- ◆ Implementation of new engineering or administrative controls that eliminate or significantly mitigate hazard
- ◆ Sampling information or monitoring data that show the contaminant levels to be stable and lower than established action limits
- ◆ Elimination of potential skin absorption or contact hazards.

NOTE: *The PPE requirement for specific project tasks is identified in Table 8. This list may be augmented by an AHA (JSA). Potential exposures and hazards will be monitored (as discussed in Section 8) during the course of the project to evaluate changing conditions and to determine PPE level adequacy and modifications.*

6.6 Inspection of Personal Protective Equipment

All PPE ensemble components must be inspected before use and when in use during project activities in accordance with HSP-11-003, “Personal Protective Equipment” and per the manufacturer’s instructions. Once PPE is donned, self-inspection will serve as the principal form of inspection. If PPE should become damaged or degradation or permeation is suspected, the individual wearing the PPE will inform others of the problem and proceed directly to the work area exit point where damaged PPE will be doffed and replaced. In addition, all PPE that becomes grossly contaminated with contaminated media or presents a potential source for the spread of such contamination will be required to be decontaminated or replaced.

Table 9 provides a general inspection checklist for common PPE items. Not all PPE ensemble items listed may be required for project tasks. Where specialized protective clothing or respiratory protection is used or required, the manufacturer’s inspection requirements in conjunction with regulatory or industry inspection practices will be followed. The assigned project SSHO should be consulted about specific PPE inspection criteria.

Table 9 Inspection Checklist for Personal Protective Equipment.

Personal Protection Equipment Item	Inspection
<p><u>Respirators</u> (full-facepiece air-purifying and supplied air respirators with escape-only SCBA bottles or escape cartridges)</p> <p>(See HSP-11-007 for additional inspection requirements)</p>	<p><u>Before use:</u></p> <ul style="list-style-type: none"> • Ensure airline matches the airline respirator to be used. • Inspect airline hose connections (sections of hose) to ensure all are threaded or permanent metal-to-metal connections (no quick disconnect pieces). • Check condition of the facepiece, head straps, valves, connecting lines, fittings, and all connections for tightness. • Check cartridge to ensure proper type or combination are being used for atmospheric hazards to be encountered, and inspect threads and O-rings for pliability, deterioration, and distortion. • Check for proper setting and operation of regulators and valves, check all hose connections back to the breathing-air compressor, check the pressure to the airline station and on individual airline connections to ensure pressure is within required range (in accordance with the manufacturer’s specifications).
<p>Air hoods</p>	<p><u>Before use:</u></p> <ul style="list-style-type: none"> • Ensure airline matches the air hood to be used. • Visually inspect all seams and surfaces for tears and cracks. • Pressurize air hood to check for pinholes or defective seams (no air should leak out when choking clear hood-piece). • Before entry into contaminated area: • Inspect all airline connections for tight fit (pull connections three times). • Ensure air compressor is providing a minimum of 110 psi when all personnel have airlines hooked up to the compressor manifold.
<p>Level D, C and B clothing</p>	<p><u>Before use:</u></p> <ul style="list-style-type: none"> • Visually inspect for imperfect seams, nonuniform coatings, and tears. • Hold PPE up to the light and inspect for pinholes, deterioration, stiffness, and cracks. <p><u>While wearing in the work zone:</u></p> <ul style="list-style-type: none"> • Inspect for evidence of chemical attack such as discoloration, swelling, softening, and material degradation. • Inspect for tears, punctures, and zipper or seam damage. • Check all taped areas to ensure they are still intact.
<p>Gloves</p>	<p><u>Before use:</u></p> <ul style="list-style-type: none"> • Pressurize rubber gloves to check for pinholes: blow in the glove, then roll until air is trapped and inspect. No air should escape. <p><u>Leather gloves:</u></p> <ul style="list-style-type: none"> • Inspect seams and glove surface for tears and splitting and verify no permeation has taken place.

7.0 MEDICAL SURVEILLANCE AND PHYSICAL EXAMINATIONS

Personnel participate in the NWI medical surveillance program in accordance with NWI HSP-006, "Medical Surveillance," and 29 CFR 1910.120 requirements. This includes:

- ◆ Personnel who are or may be exposed to hazardous substances at or above the OSHA PEL or published exposure limits, without regard to respirator use, for 30 or more days per year.
- ◆ Personnel who wear a respirator in performance of their job or who are required to take respirator training to perform their duties under this SSHP must participate in the medical evaluation program for respirator use at least annually, as required by 29 CFR 1910.134.
- ◆ Personnel exposed to substances above the established action level or where initial exposure assessment indicate a potential for exposures above the action level requiring medical surveillance for substances listed in 29 CFR 1910, Subpart Z, "Toxic and Hazardous Substances."

Additional medical surveillance requirements may apply where new hazards are encountered and based on exposure monitoring results. All personnel conducting HAZWOPER tasks must have current fitness for duty form (physician's written opinion) or equivalent stating that they are medically qualified to perform HAZWOPER tasks and wear required PPE, as well as listing any medical or physical restrictions as applicable.

A board certified or board eligible occupational health physician (OHP) will be contracted for occupational health services in support of this project. This SSHP, including the analysis of hazards, required PPE, site contaminants, and other exposure-related information, shall be made available to the OHP for each employee participating in field activities. Exposure monitoring results and hazard information furnished to the physician must be supplemented or updated annually as long as the employees are required to maintain a HAZWOPER employee medical clearance for this project.

The OHP shall evaluate the physical ability of an employee to perform the work assigned, as identified in the site SSHP or other job-related documentation. A documented medical clearance (i.e., physician's written opinion) will be provided to the employee and the HSM stating whether

the employee has any detected medical condition that would place him/her at increased risk of material impairment of his/her health from work in hazardous waste operations, emergency response, or respirator use (as applicable). The physician may impose restrictions on the employee by limiting the amount and/or type of work performed. The physician's responsibilities, with regard to personnel assigned to hazardous waste site activities, include but are not limited to:

- ◆ Providing current comprehensive medical examinations, as determined by the examining physician, for identified personnel
- ◆ Obtaining records/reports from employee's private physicians, as required by the physician for a complete evaluation
- ◆ Conducting a medical evaluation in the event that management questions the ability of an employee to work or if an employee questions his/her own ability to work.

The OHP will evaluate all information provided, including medical questionnaires, physical exam findings, blood chemistry and urinalysis results, preexisting medical conditions, nature of work to be performed, actual and potential hazards and exposures, and other factors deemed appropriate by the physician for determining the following for each employee, such as:

- ◆ Ability to perform relevant occupational tasks
- ◆ Ability to use respiratory protection as required
- ◆ Ability to work in other PPE and heat/cold stress environments
- ◆ Requirement for entry into substance-specific medical surveillance programs.

7.1 First-Aid/CPR

At least one person on site shall be first-aid/CPR trained (American Red Cross course or equivalent) during all active work periods. First aid will be provided on a voluntary basis and only within the level of training of the first aid provider on a voluntary basis. The names of the first-aid/CPR trained personnel will be communicated to all project personnel during the SSHP/APP briefing and to all new personnel during their initial SSHP/APP briefing. Emergency medical treatment will be handled as described in Section 7.2.

7.2 Emergency Medical Treatment

In the event of a known or suspected injury or illness due to exposure to a hazardous substance, or physical agent, the worker(s) shall be evaluated by a first-aid/CPR trained worker and stabilized for transportation to and treatment at the Fairbanks Memorial Hospital Emergency Department. (See Section 13 for direction to the Medical Center.) If it is not safe to move the injured person, then they will be stabilized and treated for shock by a first aid/CPR trained worker until an ambulance arrives. An ambulance will be requested by calling 911. The procedures listed below may also be applied to non-emergency incidents. Injuries and illnesses, including overexposure to contaminants, must be reported to NWI Human Resources. If there is doubt about whether medical treatment is necessary, or if the injured person is reluctant to accept medical treatment, contact the NWI medical consultant. During non-emergencies, follow these procedures (as appropriate):

- ◆ Notify appropriate emergency response authorities.
- ◆ The SSHO will assume charge during a medical emergency until the ambulance arrives or until the injured person is admitted to the emergency room.
- ◆ Prevent further injury, as possible.
- ◆ Administer first aid (voluntary basis), as necessary. Note: Only those trained in first aid and CPR should administer first aid.
- ◆ Get medical attention for the injured person immediately.
- ◆ Perform decontamination where feasible; however, lifesaving and first aid or medical treatment take priority.
- ◆ Make certain that the injured person is accompanied to the emergency room.
- ◆ When contacting the medical consultant, state that the situation is a NWI matter and give your name and telephone number, the name of the injured person, the extent of the injury or exposure, and the name and location of the medical facility where the injured person was taken.

If an employee suspects exposure, additional medical monitoring will be available and the employee must complete an employee exposure/injury incident report and North Wind Form-520, "Incident Report Form."

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8.0 EXPOSURE MONITORING/AIR SAMPLING PROGRAM

Monitoring and sampling will be used throughout project tasks to 1) assess the effectiveness of engineering controls, 2) determine the appropriate PPE requirements for individual tasks, and 3) determine the need for upgrading and downgrading of PPE as described in Section 6. Monitoring with direct-reading and mobile instruments will be conducted to provide the HSM with real-time and trending data to assess the effectiveness of control measures.

The SSHO will conduct full- and partial-period sampling of airborne contaminants and monitoring of physical agents based on site conditions. When conducted, all air sampling will be performed using applicable National Institute of Occupational Safety and Health (NIOSH), OSHA, or other validated method. Both personal and area sampling and monitoring may be conducted.

Various direct-reading instruments (or equivalent) may be used to determine the presence of chemical and other physical agents. The frequency and type of sampling and monitoring will be determined by changing site conditions, direct-reading instrument results, observation, and professional judgment.

All monitoring instruments will be maintained and calibrated in accordance with the manufacturer's operating instructions. Direct reading instruments will be calibrated, at a minimum, before daily use and more frequently as determined by the project SSHO. Calibration information, sampling and monitoring data, results from direct-reading instruments, and field observations will be recorded on exposure monitoring forms or in the field logbook.

8.1 Air Monitoring

Based on the hazards assessment for this site, air monitoring for VOC compounds will be conducted using a photoionization detector (PID). A multigas monirotor may also be used during intrusive activities to alert personnel to the presence of increased lower explosive limit,

decrease in oxygen concentrations, increased carbon monoxide concentrations, and the presence of hydrogen sulfide gas. A real-time aerosol/particulate monitor may also be used in conjunction with visual observations to determine the airborne particulate concentrations. Where visible dust levels are observed in the workers breathing zone, control measures such as wetting the soil or repositioning workers will be used to control exposures to airborne dusts.

Periodic sampling for airborne PCBs may also be conducted to validate continued use of engineering controls are effective.

8.2 Noise Monitoring

Noise measurements will be performed as determined necessary by the SSHO for activities with the potential to create noise problems such as heavy equipment or soil boring operations. For hearing protection purposes it will be assumed that all heavy equipment generates noise levels in excess of 85 dBA and hearing protection will be required when operating the equipment or when within 25-feet of operating equipment exceeding 85 dBA. The requirement for hearing protection can be removed if sound level measurements show exposures are less than 85 dBA.

A TLV of 85 dBA (TWA) will be applied to personnel exposed to noise levels over no more than an 8 hour day. This level is based on a 16-hour “recovery” period in a low noise environment. If personnel are required to work longer than 8 hours in a hazardous noise environment, then the TLV will be adjusted to a lower value such as 83 dBA for a 10 hour TLV TWA value. The project HSM (CIH) must be consulted regarding modifications to the 85 dBA for 8-hour TLV, and 83 dBA for 10-hour TLV TWA value.

Personnel whose noise exposure meets or exceeds the allowable level will be enrolled in the North Wind Conservation Program in accordance with North Wind ESH-008, “Hearing Conservation.” The SSHO shall ensure the results are reported back to the sampled employee, representative sampled employees, and the PM.

Personnel working on jobs that have noise exposures greater than 85 dBA (83 dBA for 10-hour TWA) will be required to wear hearing protection until noise exposure levels have been fully

evaluated and noise exposure mitigated to reduce it to less than the established limits, as determined by the SSHO. Hearing protection such as earplugs or earmuffs shall be available at the site for use by personnel who must work for extended periods in the established noise areas.

8.2.1 Radiological Monitoring and Instrument Calibration

Portable direct-reading radiological instrumentation such as a rate meter with a Geiger-Mueller (GM) detector may be used to screen debris that could potentially contain radioactive materials (such as aircraft gauges or dials). If debris or other articles are found that contain radioactive materials then they will be isolated, reported to the USACE and Army project personnel, and personnel in the area will conduct a personal contamination survey in accordance with Attachment 6 guidance.

All portable survey instruments will be source-checked to ensure they are within the specified baseline calibration limits using the NWI Daily Response Check Form (Attachment 5). Accountable radioactive sources and radiological survey and monitoring equipment will be maintained and calibrated in accordance with the manufacturer's recommendations and 10 CFR 20, "Standards for Protection Against Radiation."

8.3 Project Action Levels and Associated Actions

Threshold-limit values (TLVs) or other occupation exposure limits have been established for numerous chemicals and physical agents (e.g., noise, heat, or cold stress) that may be encountered. These exposure limits provide guidelines in evaluating airborne, skin, and physical agent exposures. The TLVs represent levels and conditions under which it is believed that nearly all workers may be exposed day after day without adverse health effects. The TLV-time-weighted average (TWA) is a TWA concentration for a conventional 8-hour workday and a 40-hour workweek, to which it is believed that nearly all workers may be repeatedly exposed, day after day, without adverse health effects. Action limits (ALs)(instantaneous concentrations for short time periods) have been established to further reduce the likelihood of exceeding TLVs or as regulatory triggers for additional medical surveillance and actions. These concentrations for contaminants of concern are provided in Table 10.

Table 10 Action Levels and Associated Responses for Project Operational Hazards.

Contaminant or Parameter Monitored	Action Level	Response Taken if Action Level Is Exceeded
Particles (Insoluble or Poorly Soluble, Not Otherwise Specified [PNOS]) <i>Note: Does not apply to soil disturbance tasks in the PCB contaminated soil areas.</i>	$\leq 10 \text{ mg/m}^3$	No action
	$>10 - <25 \text{ mg/m}^3$ (inhalable fraction) Sustained for 5 minutes in worker's breathing zone (optical detector)	<ol style="list-style-type: none"> 1. Use wetting or misting methods to minimize dust and particulate matter and continue to monitor. 2. Substitute equipment or change method to reduce emissions at source. 3. Evaluate air movement (wind) conditions and reschedule tasks or reposition personnel to upwind position of source and continue to monitor.
	$>25 \text{ mg/m}^3$ (inhalable fraction) Sustained for 2 minutes on worker breathing zone (optical detector) OR $>10 \text{ mg/m}^3$ (inhalable fraction) $>3 \text{ mg/m}^3$ (respirable fraction) (as measured with full period monitoring)	<ol style="list-style-type: none"> 1. Halt operations, place equipment in safe configuration and exit work area until water truck can wet area. 2. Monitor area after wetting. IF airborne levels drop below 10 mg/m^3, THEN resume activities and continue to monitor. IF airborne levels are above 10 mg/m^3, THEN rewet area and continue to monitor. IF airborne levels can not be controlled below 25 mg/m^3 by wetting THEN move operation to alternant location (with engineering controls if possible) 3. Verify engineering control operation (where in place) or institute engineering controls (such as use of closed cabs for equipment operators) IF wetting or misting methods prove ineffective, THEN don particulate respiratory protection (as directed by SSHO) or cease operations until area can be adequately wetted can be achieved or weather condition causing elevated dust level (e.g., high winds) subside. Note: Respiratory protection will be selected based on the nature of the contaminant. If metal particulate contaminants have been sampled for, then a dust mask (filtering facepiece) may be worn for nuisance particulates.

Contaminant or Parameter Monitored	Action Level	Response Taken if Action Level Is Exceeded
Airborne contaminant (chemical, dust fume, fiber or particulate)	<p>Based on individual contaminant exposure limit (2006 ACGIH TLV or OSHA PEL) and 29 CFR 1910 or 1926 substance-specific requirements.</p> <p>Generally, sustained levels at the TLV or PEL in the worker's breathing zone for two minutes should be used as action limit. Where ceiling values or OSHA substance-specific action limit exists, use these values.</p>	<ol style="list-style-type: none"> 1. Substitute equipment or change method to reduce emissions at source 2. Verify engineering control operation (where in place) or institute engineering controls 3. Evaluate air movement (wind) conditions reschedule tasks or reposition personnel to upwind position of source 4. Move operation to alternant location (with engineering controls if possible) 5. <u>IF</u> engineering and administrative controls do not control contaminant below exposure limit, <u>THEN</u> reevaluate engineering and administrative controls or don respiratory protection^a (as directed by IH) <p><u>IF</u> OSHA substance-specific standard action limit is exceeded, <u>THEN</u> initiate applicable medical surveillance requirements.</p>
Chemical hazardous atmosphere for an excavation that will be entered (contingency only)	<p>Note: This is provided as a contingency only. Should the excavation competent person suspect a hazardous atmosphere exist, they must contact the project SSO for further evaluation.</p>	<ol style="list-style-type: none"> 1. Eliminate hazardous atmosphere through use of engineering controls or allowing natural ventilation to diffuse/dilute contaminant. 2. (Non LEL Only) - Evaluate excavation to be entered. IF the operation can be conducted outside the excavation, THEN perform operation without entry. 3. Measure atmosphere before initiating operation or personnel entry and verify acceptable entry conditions have been met (e.g., oxygen and LEL). 4. Reschedule operations when excavation atmosphere is safe to enter. 5. IF atmospheric conditions are above safe limits and not declining, THEN stop operation until safe atmosphere and specified entry conditions can be achieved. <p>No entry into an area or excavation containing methane LEL concentrations or hazardous atmosphere (oxygen deficient/enriched, IDLH or other acute airborne hazardous condition).</p>

Contaminant or Parameter Monitored	Action Level	Response Taken if Action Level Is Exceeded	
Hazardous noise levels	<84 dBA 8-hour TWA	No action.	
	85 to 114 dBA	<ol style="list-style-type: none"> 1. Substitute equipment with lower noise generating type 2. Isolate noise source or place sound-absorbing barrier in noise path 3. Hearing protection required to attenuate hazard to below 85 dBA 8-hour TWA exposure or equivalent shorter exposure at higher level (use only ½ the rated NRR for ear plugs to meet attenuation requirement). 	
	(a) >115 dBA	(b) >140 dBC	(a) Isolate source, evaluate NRR for single device, double protection as needed.
Heat and Cold Stress	As defined in Section 3.5	As defined Section 3.5	
FTW Emergency	FTW evacuation notification	See Section 11 for emergency response actions.	
<p>ACGIH = American Conference of Governmental Industrial Hygienists CFR = Code of Federal Regulations IDLH = immediately dangerous to life or health NRR = noise reduction rating OSHA = Occupational Safety and Health Administration PEL = permissible exposure limit TLV = threshold-limit value TWA = time-weighted average</p>			

To prevent and mitigate potential personnel exposure to environmental and physical hazards at the project site, ALs have been established that have been evaluated and determined to present the highest exposure potential. Action levels, and associated responses, are listed on Table 10. If ALs are reached, personnel will take the appropriate action as stated. For upgrading PPE, the threshold (i.e., protection factor) for the particular level being worn must be exceeded, or another type of contaminant introduced, to justify PPE modification (i.e., half-face air-purifying respiratory protection offers the respiratory protection factor of 10, so the contaminant must exceed 10 times the TLV for an upgrade to be warranted).

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9.0 INCLEMENT WEATHER AND ENVIRONMENTAL HAZARDS

Heat and cold stress hazards and mitigation are addressed in Section 3 in accordance with ACGIH guidance. When there are warnings or indications of impending severe weather (heavy rains, damaging winds, tornados, hurricanes, floods, lightning, etc.), weather conditions shall be monitored by the SSHO and appropriate precautions taken to protect personnel and property.

9.1 Hot Environments

In hot environments, drinking water shall be made available to workers and workers shall be encouraged to frequently drink small amounts, e.g., one cup every 15-20 minutes: the water shall be kept reasonably cool. In situations where heat stress may impact worker safety and health, worker acclimatization and workloads shall be assessed and work/rest regimens shall be established as described in Section 3. For workers in impermeable work clothing, only physiological monitoring shall be conducted, and work/rest regimens and fluid replacement schedules shall be established as specified in the ACGIH's "Threshold Limit Values and Biological Exposure Indices."

9.2 Cold Environments

Employees working in air temperatures of -15 °F (-26 °C) or less shall use the work-/warm-up regimen specified in the ACGIH "Threshold Limit Values and Biological Exposure Indices."

9.3 Cold Weather Sheltering and Clothing Requirements

- ◆ If wind chill is a factor at a work location, the cooling effect of the wind shall be reduced by shielding the work area or providing employees an outer windbreak layer garment.
- ◆ Extremities, ears, toes, and nose shall be protected from extreme cold by protective clothing.
- ◆ Employees whose clothing may become wet shall wear an outer layer of clothing that is impermeable to water.

- ◆ Outer garments must provide for ventilation to prevent wetting of inner clothing by sweat.
- ◆ If clothing is wet, the employee shall change into dry clothes before entering a cold environment.
- ◆ Workers shall change socks and removable felt insoles at regular daily intervals or shall use vapor barrier boots.
- ◆ Due to the added danger of cold injury due to evaporative cooling, workers handling evaporative liquid (such as gasoline, alcohol, or cleaning fluids) at air temperatures below 40 °F (4 °C) shall take precautions to avoid soaking of clothing or contact with skin.
- ◆ Eyewear providing protection against ultraviolet light, glare, and blowing ice crystals shall be provided to workers employees in snow- and/or ice-covered terrain.

9.4 Protection from Ultraviolet Light

Where employees are exposed to solar radiation for short periods and there is the potential for sunburn or are exposed for prolonged periods where long-term exposure could lead to health effects such as skin cancer, they shall be provided sun screen with a sun protection factor (SPF) appropriate for their skin type and exposure. Sunscreens shall be used only in accordance with the manufacturer's recommendations.

10.0 STANDARD OPERATING PROCEDURES

NWI health and safety procedures outlined in this SSHP and the APP will be followed at all time by personnel performing project tasks. In addition, the following general safe-work practices (Table 11) are provided to further reduce the likelihood of accidents and injuries and are mandatory for all project personnel. All visitors permitted to enter work areas must also follow these requirements. Failure to follow these practices or other project requirements may result in permanent removal from the project and other disciplinary actions. The project FM and SSOH will be responsible for ensuring the following safe-work practices are adhered to.

Table 11 Safety Procedures, Controls, and Work Practices.

Title	Description
Dust Controls	Engineering and administrative controls for dust may include, but are not limited to, dust suppression using water, application of soil surfactants to stabilize exposed soil, use of containment structures, positioning of required personnel upwind of soil disturbance or handling activities, restriction of unauthorized personnel entry into soil disturbance areas, limiting access to the work area to the minimum necessary field personnel, selection of equipment with fully enclosed operator cabs, selection of soil handling and excavating equipment and techniques to minimize dust creation, or stopping operations when wind speeds reach a point that dust is disturbed.
The Buddy System	The “buddy system,” or 2-person system, will be used at the site when personnel have entered into an established exclusion zone (EZ). The buddy system requires each employee to assess and monitor his or her “buddy’s” mental and physical well being during the course of the workday and serves as a check for accountability. A buddy must be able to provide assistance, verify the integrity of PPE, observe their partner for signs and symptoms of heat stress, cold stress, or contaminant exposure, and notify other personnel if emergency assistance is needed. Workers need to be able to see or hear and effectively communicate with their buddy at all times when in the EZ.
Established Eating and Drinking Area	Prohibitions against eating or drinking inside the EZ and Contamination reduction zone (CRZ) will be enforced. Ingestion of hazardous substances is likely when workers do not practice good personal hygiene habits. It is important to wash hands, face, and other exposed skin thoroughly after completion of work and before smoking, eating, drinking, and chewing gum or tobacco. No chewing, eating, applying skin products, or drinking is allowed within the EZ or CRZ. As a minimum, all personnel will wash their hands (or utilize disinfectant solution or towelettes) prior to performing these activities in the designated eating area (support zone). Restroom facilities (portable toilets) or existing FTW facilities will be made available for field team personnel at the project site.

Table 11. (continued).

Title	Description
<p>Drilling, Excavation and Trenching</p>	<p>Serious accidents and extensive property damage occur when drilling or excavating equipment encounters unexpected underground utility lines. Such utilities include gas lines, electrical lines, sewers, and telephone lines. The probability of accidentally encountering these lines is minimized if the lines are marked by a line location service. Before any invasive fieldwork begins, a utility clearance shall be performed to identify the location of any subsurface utilities. Other excavation requirements are listed in Section 3.</p>
<p>Material Handling</p>	<p>Material handling tasks pose a significant injury hazard to workers. The precautions in Section 3 shall be implemented to reduce potential worker injuries. Employees shall be trained in and shall use safe lifting techniques for manual material handling tasks. Good housekeeping shall be maintained and enforced by the FM to reduce potential for injuries during material handling activities. Whenever heavy or bulky material is to be moved, the material handling needs shall be evaluated in terms of weight, size, distance, and path of movement to select the safest method for handling the material. When possible, materials will be handled using mechanical devices or handling aids as a preference to using manual material handling. Material handling devices shall be available for material handling needs.</p>
<p>Confined Space Entry</p>	<p>Confined space entry is not anticipated for this project. If conditions change, the SSHO, in consultation with the Project HSM, will evaluate the situation to determine if implementation of a NWI HSP-11-010, “Confined Spaces” is warranted.</p>
<p>Electrical Safety</p>	<p>Only authorized qualified electricians shall be allowed to install, modify, or work on electrical supply systems. This includes installation of a temporary electrical supply or modification of permanent electrical supply equipment. Project field personnel may utilize the electrical supply systems once installed for field use. The following precautions shall be observed:</p> <p>Prior to use, all electrical equipment, power tools, and extension cords shall be inspected for damage. Damaged or defective electrical equipment shall be removed from service immediately.</p> <p>All temporary wiring, including all electrical power tools and extension cords, must have a ground fault circuit interrupter installed, or power tools must be double insulated and UL-approved.</p> <p>All electrical wiring or systems shall be considered energized unless under the protection of LO/TO.</p> <p>Extension cords shall be equipped with a third wire ground and be protected from damage when passing through the work areas.</p> <p>Safe clearance shall be maintained between overhead power lines and project personnel or conductive equipment. As a minimum, a distance of 10 feet from overhead power lines shall be maintained for voltages of 50 kV or less. For voltages over 50 kV, a minimum of 10 feet plus 4 inches for every 10 kV over 50 kV shall be maintained.</p>

Table 11. (continued).

Title	Description
Lockout/Tagout	Before project personnel perform any servicing or maintenance on a system where the unexpected energizing, start up, or release of kinetic or stored energy could occur and cause injury or damage, the system shall be isolated. Personnel working with or around an isolated system must be properly trained as either an affected or an authorized employee as appropriate for the tasks. Lockout/tagout (LO/TO) shall only be performed by authorized employees who are trained on the safe application, use, and removal of LO/TO devices. Where LO/TO is required, the requirements of NWI HSP-11-012, “Control of Hazardous Energy” will be followed. Hazardous energy control procedures for the project shall be submitted to the USACE designated authority for acceptance prior to use. The FM shall be responsible for coordinating LO/TO activities with the USACE authorities throughout the planning and implementation of these activities.
Equipment Guarding	Hand and power tools shall be used, inspected, and maintained according to the manufacturer’s recommendations. The tools will be inspected, tested, and determined to be in safe operating condition before use. Tools having defects that render them unsafe shall be removed from service and secured to prevent use until the tool has been returned to a safe condition. Power tools and equipment designed to accommodate guards shall be equipped with such guards.
Fall Protection	Working at elevated heights or from ladders is not anticipated to complete the project tasks. If a situation develops that requires personnel to work on an unprotected surface greater than 6 feet high, the SSHO shall ensure the applicable requirements in EM 385-1-1, Section 21, “Safe Access and Fall Protection” and NWI HSP-11-014, “Fall Protection” are implemented prior to performing the work.
Hazard Communication	<p>The SSHO shall maintain an inventory and active chemical management process for chemicals brought to the work site, in accordance with NWI HSP-11-002, “Hazard Communication,” including:</p> <ul style="list-style-type: none"> ◆ Maintain copies of all material safety data sheets (MSDSs) for chemicals to which employees are potentially exposed. The MSDSs shall be maintained at the project site and shall be on hand before or as the chemicals arrive on site. ◆ Ensure an adequate manufacturer’s label is in place on each chemical container, or label chemical containers with the chemical’s identity and hazard warnings. ◆ Store all chemicals properly in accordance with their MSDSs. Consider compatibility, quantity limits, secondary containment, fire prevention, and environmental conditions.
Illumination	The project will perform outside work activities under normal daylight conditions or supplementary light plants will be provided to adequately illuminate the work area. Due to the operation of heavy equipment and the hazards associated with drilling equipment, the use of light plants will only be permitted after extensive review and approval of the project HSM. Issues to consider include operations taking place, personnel/equipment operating in the area, size of the area, number and adequacy of available light plants, and the ability for personnel to safely work under the artificial lights.

Table 11. (continued).

Title	Description
Work Site Sanitation	Restroom facilities and facilities for washing hands and face will be available for field team personnel at the project site. All personnel will be required to wash their hands and face before eating or drinking in the SZ.
Housekeeping	Practice good housekeeping at all times. Turn in or place tools in the designated storage location after use. Put waste materials in the appropriate waste container or receptacle. If there is a question as to where to dispose of a waste article, personnel should ask the FM or SSHO.

11.0 SITE-CONTROL PLAN

Site control and security will be maintained at the project locations during all activities to prevent unauthorized personnel from entering the controlled work area. Entry into and exit from these areas will be controlled through the appropriate use of barriers, cones, and signs.

The FM and SSHO should be consulted regarding equipment layout at the project site to minimize hazards from equipment. Equipment layout at the project site should reflect the nature of the hazard present and be mitigated through the use of engineering controls (barriers, guards, isolation), administrative controls (roped-off restricted areas or controlled access), and qualifications of operators and those assisting in the operation of the equipment, when required.

Good housekeeping will be maintained at all times during the course of the project. This includes maintaining working and walking surfaces to minimize tripping hazards, stacking or storing materials and equipment in a central location when not in use, and regularly cleaning up debris and trash that may accumulate at the project site.

Based on the nature of the project tasks, a graded approach with two types of site control designations (work areas) will be used to meet HAZWOPER site control requirements. These work areas will be based on the potential hazards, complexity of work tasks, duration of project tasks, and location and number of non-project personnel near the project area. Two basic areas will be established for this project as follows:

- ◆ Controlled Work Area (CWAs) (established for low-hazard routine tasks)
- ◆ Exclusion Zones (EZs) (established for higher-hazard, contamination areas, UXO/MEC clearance tasks).

A controlled work area will be established as the minimum requirement during project activities. Currently the fence around the Taku Garden site provides a physical barrier for the site and is considered a CWA. An EZ and/or OSHA regulated area may be required if contaminants exceed

the action level or for UXO/MEC clearance activities within the CWA. Based on the expected levels of chemical contamination known at the site, a CWA will serve as the primary site control for all areas other than the PCB soils area (EZ).

Figure 2 shows the general layout of a CWA that will be established. Figure 3 illustrates a generalized configuration of an EZ. These figures represent the general configuration of work zones and are not intended to provide an exact layout or configuration of all equipment or zone sizes. Several factors may result in changing zone configurations, sizes, and locations. These factors include the site being investigated, project tasks being conducted, site monitoring data, and changing wind direction. Additionally, entrance and egress points may change based on these same factors.

Personnel not directly involved with project activities will be excluded from these controlled work areas. Visitors may be admitted into work areas if they are on official business, have received site-specific training or orientation by the FM or designee, have documented evidence (training record or cards) for all site-specific training requirements for the site they wish to access, and wear required PPE for the area.

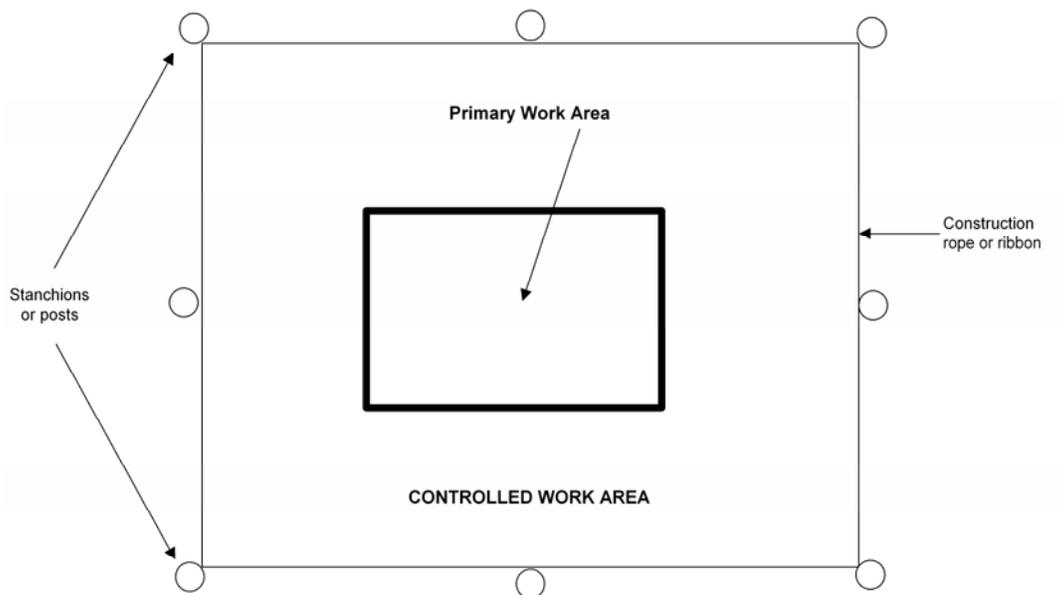


Figure 2 General configuration for CWA.

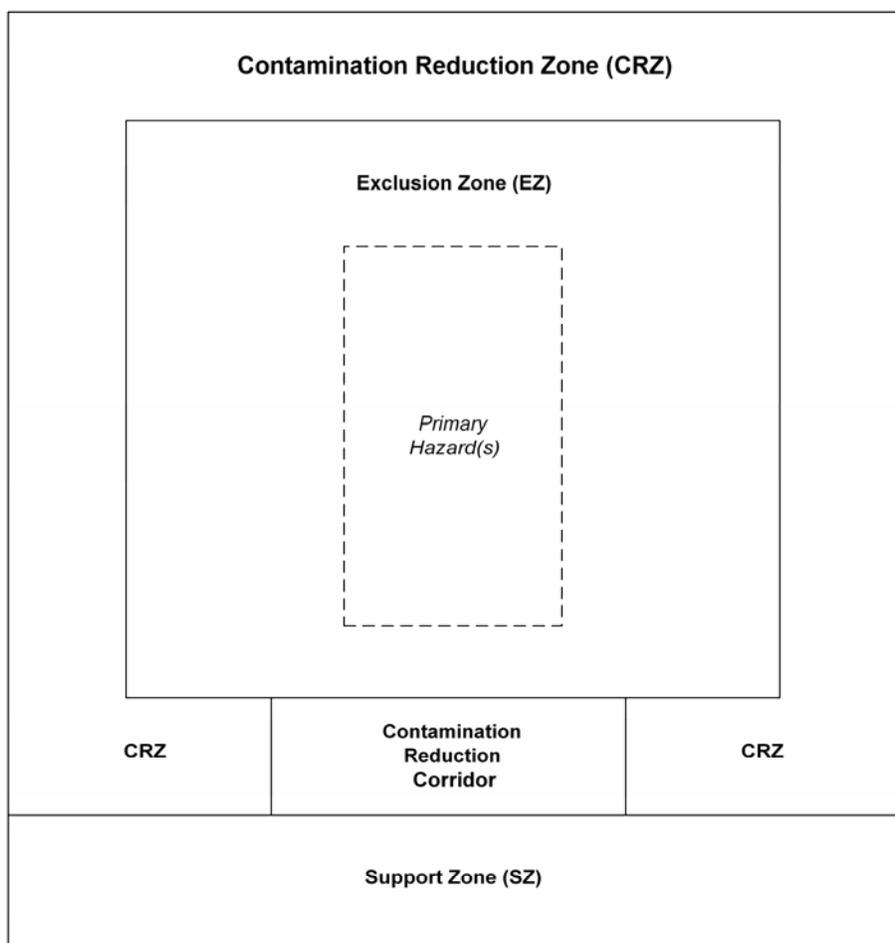


Figure 3 General configuration for EZ Work Control Zones (EZ, CRZ, and SZ).

11.1 Exclusion Zone

The EZ is the area where contamination or potential contamination exists or as designated for control of personnel around UXO/MEC clearance areas. Since this area has the potential for workers to be exposed to site contaminants and safety hazards, all field personnel entering this area will wear the appropriate PPE (minimum of Level D) and adhere to the training and medical surveillance requirements presented in this document. Field personnel entering the EZ will enter and exit through the established entry and exit control points. Gross decontamination will take place near the “hotline” in the EZ before proceeding to the support zone (SZ). The EZ will be demarcated by using lines, placards, and hazard tape and/or signs, or will be enclosed by physical barriers such as chains, fences, or ropes.

11.2 Contamination Reduction Zone

The contamination reduction zone (CRZ), located between the EZ and the SZ, is the zone where field staff and equipment will undergo gross decontamination. The CRZ will serve as a buffer to further reduce the probability of transporting contaminants or being affected by other existing hazards. It will provide additional assurance that the physical transfer of contaminants via personnel or equipment is limited through a combination of decontamination procedures and a minimum required distance between the EZ and SZ.

11.3 Support Zone

The Support Zone (SZ) is the area outside the EZ and CRZ and is considered free from recognized site hazards and contaminants and will not be delineated. Support equipment such as the project vehicles, supplies, etc. will be located in this area. Since eating is permitted in this area, potentially contaminated personal protective clothing, equipment, and samples will not be permitted beyond the EZ or CRZ. The location of the SZ at each site will depend on a number of factors, including:

- ◆ Accessibility—topography, open space available, locations of roads, or other limitations.
- ◆ Visibility—line of sight to all activities in the EZ is preferable.
- ◆ Wind direction—the support facilities preferably should be located upwind of the EZ. Shifts in wind direction and other conditions may be such that an ideal location based on wind direction alone does not exist.
- ◆ Resources—water, electricity, or places of refuge.

11.4 Site Security

Site control at FTW consists of strict base perimeter controls including guarded entrances and exits. FTW-specific security measures require that all NWI and subcontractor personnel obtain vehicle pass and have photo identification with them at all times.

All workers must be U.S. citizens and will be subject to security checks. NWI and subcontractor vehicles will have the vehicle pass or permanent installation sticker visible. All vehicles will be subject to search at anytime at FTW. No one will be allowed to carry contraband, alcohol, firearms, weapons, or knives into FTW.

Security personnel who patrol FTW may investigate any suspicious activities at the project site. General Post security and security at the project sites will be the responsibility of FTW during non-activity times (including weekends). Where chemical or physical hazards beyond existing conditions are created by project-related activities, the following measures will be implemented. To maintain security at the site locations during working hours, the SSHO will:

- ◆ Secure the site gates when leaving
- ◆ Use caution tape and temporary fencing around safety hazards (where feasible)

To maintain security during nonworking hours, the SSHO will secure the site prior to leaving at the end of a working day. All equipment and supplies will be secured or stored in locked facilities, and any open holes and trenches will be placed in a safe configuration, barricaded or roped off.

11.5 Site Communications

Two forms of communication will be available on site. The first will be for communicating internally between field team members and the second for communicating with off-site personnel. Direct verbal, radio or cell phones will be used for communication on site between field team members, and the use of cell telephones for off site communication capabilities.

11.5.1 Internal Communication

Internal Communication is used to:

- ◆ Alert team members to emergencies.
- ◆ Pass along safety information, such as weather conditions that could affect heat stress, cold stress, or general safety, etc.

- ◆ Maintain site control.
- ◆ Facilitate site work by being able to call to the appropriate party for information without having to decontaminate the work party and equipment and secure the site.

Common types of internal communication devices include:

- ◆ Direct verbal
- ◆ Radios
- ◆ Noisemakers: vehicle horn, siren, whistle
- ◆ Visual signals

11.5.2 Verbal Communication

Verbal communication can be impeded by onsite background noise and the use of PPE. Thus, it is vital that pre-arranged signals of communication be arranged prior to the initiation of site activities, particularly when heavy equipment work is involved.

11.5.3 External Communication

Primary means of external communication devices are telephones, radios, facsimile machines, and computer networks. External communication systems between onsite and offsite personnel are necessary to:

- ◆ Coordinate emergency response efforts
- ◆ Report to upper management about site activities
- ◆ Maintain contact with essential offsite personnel.

The project Communication Plan details additional notification requirements.

12.0 DECONTAMINATION

Project activities will involve contact with contaminated soils and other media requiring decontamination of equipment and potentially some degree of personnel decontamination. Every effort will be made to prevent contamination of project personnel and equipment through the use of engineering controls, isolation of source materials, contaminant monitoring, personnel contamination control training, and by following material handling requirements and procedures for contaminated or potentially contaminated materials. Where contact with potentially contaminated surfaces or entry into known contaminated areas is anticipated, monitoring as described in Section 8 in combination with use of PPE will be necessary to control the hazard. This section provides guidance on how decontamination of equipment and personnel will be performed.

Project operational decontamination procedures will be used for routine decontamination of the contaminated equipment to prevent the spread of contamination from contaminated soils or other media sampled or handled.

Decontamination will be conducted in following the specification outline in Table 13 below and based on professional judgment on a case-by-case basis under the direction of SSHO (in consultation with the project HSM as deemed appropriate) to determine the most appropriate PPE. In all cases, the collection, storage, and disposal of decontamination IDW will be addressed before the generation of such waste and stored. Protective clothing and respiratory protection selected for decontamination tasks will be based on the contaminant being decontaminated and as described in Section 6.

No eating, drinking, or smoking is permitted in project controlled or decontamination areas. The SSHO will establish areas for eating, drinking, and smoking. Eating in project vehicles may be allowed following decontamination and washing of hands and face.

12.1 Decontamination Specifications

Table 12 presents the decontamination specifications to be followed during contaminated project activities in contaminated areas.

Table 12 Decontamination Specifications.

Personnel	Sample Equipment	Heavy Equipment
<ul style="list-style-type: none"> ◆ Boot wash/rinse or remove gross debris ◆ Outer-glove removal ◆ Protective clothing removal ◆ Inner-glove removal ◆ Respirator removal (if worn) ◆ Hand wash/towelletes (as required) ◆ Face wash/towelletes (as required) ◆ Dispose of PPE in municipal trash, or contain for disposal (as specified by facility or project waste management requirements, such as PCB waste container) ◆ Dispose of personnel rinse water to facility or sanitary sewer, or contain for off-site disposal (as specified by facility) or project waste management requirements) 	<ul style="list-style-type: none"> ◆ Remove gross debris by mechanical cleaning at sample location ◆ Wash/rinse equipment using Alconox® or equivalent detergent and rinse with potable and de-ionized water 	<ul style="list-style-type: none"> ◆ Mechanical cleaning of dirt and gross debris ◆ Power wash (as required) ◆ Steam clean (as required) ◆ Dispose of equipment rinse water to facility or sanitary sewer, or contain for off-site disposal (as specified by facility or project waste management requirements)

12.2 Equipment Decontamination

Small equipment with only the possibility of external contamination will be decontaminated using a wipe-down method. Wipe-down consists of wiping the accessible surfaces of the item with a terrycloth wipe, or similar material, to remove any water or soils adhering to the surface. If necessary, the wipe may be soaked with a non-phosphate detergent and then used to wipe the equipment down. Subsequent to this, a wipe soaked with clean water will be used to complete the cleaning. Wipes, after use, are managed as IDW.

A graded decontamination approach will be utilized for decontamination of heavy equipment. This approach employs dry decontamination methods first (e.g., brushing, sweeping, wiping where radiological concerns do not prohibit these practices). If it is deemed necessary and appropriate by the project industrial hygienist that further decontamination is necessary, then wet wiping with an amended water solution (e.g., amended with a nonphosphate detergent such as Alconox) or a potential steam cleaning of this equipment may be conducted. A drainage system that allows for a single collection point will be established if steam cleaning is performed. Decontamination wastewater will be collected using a submersible pump or equivalent and characterized as IDW for final disposal.

12.2.1 Personnel Decontamination

Engineering controls, in conjunction with project contamination prevention and control practices and proper protective clothing donning and doffing procedures, will serve as the primary means to eliminate the need for personnel decontamination. The PPE selection, as identified in the Section 6, will provide for the layered barriers required to prevent permeation and minimize external surface contamination. Before donning PPE, all items will be inspected following the list in Table 9.

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13.0 EMERGENCY RESPONSE PLAN

13.1 Pre-Emergency Planning

The SSHO performs the applicable pre-emergency planning tasks before starting field activities and coordinates emergency response with NWI's on-site parties, the facility, and local emergency-service providers, as appropriate. To prepare the emergency plan, the SSHO will perform the following:

- ◆ Review the FTW emergency and contingency plans as applicable to project activities.
- ◆ Determine what on-site communication equipment is available (e.g., two-way radio, vehicle horn).
- ◆ Determine what off-site communication equipment is needed (e.g., nearest telephone, cell phone).
- ◆ Confirm and post emergency telephone numbers, evacuation routes, assembly areas, and route to hospital. The SSHO will communicate this information to on-site personnel.
- ◆ Field Trailer(s): Post "Exit" signs above exit doors and post "Fire Extinguisher" signs above locations of extinguishers. Keep areas near exits and extinguishers clear.
- ◆ Review changed site conditions, on-site operations, and personnel availability in relation to emergency response procedures.
- ◆ Where appropriate and acceptable to the client, inform emergency room and ambulance and emergency response teams of anticipated types of site emergencies.
- ◆ Designate one vehicle as the emergency vehicle, place hospital directions and map inside, and keep keys in ignition during field activities.
- ◆ Inventory and check site emergency equipment, supplies, and potable water.
- ◆ Communicate emergency procedures for personnel injury, exposures, fires, explosions, and releases.
- ◆ Rehearse the emergency response plan before site activities begin, including driving the route to the hospital.
- ◆ Brief new workers on the emergency response plan.

The SSHO will evaluate emergency response actions and initiate appropriate follow-up actions.

13.2 Emergency Equipment and Supplies

The SSHO should mark the locations of emergency equipment, as listed on Table 13, on the site map and post the map.

Table 13 Emergency Equipment and Supplies.

Emergency Equipment and Supplies	Location
10-pound fire extinguisher (A:B:C classes)	Support zone/5 lb on heavy equipment
First aid kit	Support zone/field vehicle
Eye wash bottles (2)	Support and decon zone/field vehicle
Potable water	Support and decon zone/field vehicle
Bloodborne-pathogen kit (contained in first aid kit)	Support zone/field vehicle

13.3 Incident Response

During fires, explosions, or chemical releases, actions to be taken include the following:

- ◆ Shut down work operations and evacuate the immediate work area
- ◆ Notify appropriate response personnel
- ◆ Account for personnel at the designated assembly area(s)
- ◆ Assess the need for site evacuation and evacuate the site as warranted.

Instead of implementing a work-area evacuation, note that small fires or spills posing minimal safety or health hazards may be controlled. Following control, all incidents shall be reported to the PM, Client, and Fort Wainwright POCs, as listed in Table 14 and 15 as addressed in the project Communications Plan. Emergency contacts are listed on Table 16.

Table 14 North Wind Project Personnel.

Position	Name	Location/Telephone Number
Project Manager	Aran Armstrong	Anchorage (907) 277-5488 or Cell phone 907-322-4736
Site Manager/SSHO	Dan McGauhey	Fairbanks (907) 441-7750
North Wind Alaska Operations Manager	Joey Gillespie	Anchorage (907) 277-5488
Health and Safety Manager	Bruce Miller, CIH	Idaho (208) 557-7900 or Idaho (208) 520-4644 (cell)
<p>Note: The SSHO will contact the Project Manager and health and safety director in the event of any health or safety incident or near miss. In general, the Project Manager will contact the client. The SSHO will then complete a North Wind Form 520, Incident Report Form.</p>		

Table 15 Client Points of Contact.

Name	Title	Agency	Telephone Number
Robert Brock	USACE Project Manager	USACE	(907) 753-5612
Therese Deardorff	DPW Technical Support	USARGAK - DPW	(907) 384-2716
Joe Malen	DPW Fort Wainwright POC	USARGAK - DPW	(907) 353-4512
Karen Dearborne	DPW Technical Support	USARGAK - DPW	(907) 384-2694
Julie Sharp-Dahl	USACE Environmental Scientist	USACE	(907) 753-5689
Jacques Gusmano	EPA	EPA	(907) 271-5083
Sharon Richmond	ADEC	ADEC	(907) 451-2158
<p>ADEC = Alaska Department of Conservation DPW = Directorate of Public Works EPA = Environmental Protection Agency POC = point of contact USACE = U.S. Army Corps of Engineers USARGAK = U.S. Army Garrison, Alaska</p>			

Table 16 Emergency Contacts.

EMERGENCY CONTACTS Safety and Health Plan	
North Wind, Inc. 24-Hour Emergency Telephone Numbers Day (907)277-5488 — Night (907)338-9448	
Project Name: Ft. Wainwright Soils Management	Project Number: 2316
Medical/Fire/Spill Emergency : 911	Local Occupational Physician: None
Security & Police – 8-911 353-7889 (non-emergency)	North Wind’s Manager for Health and Safety Name: Bruce Miller Phone: (208) 528-8718 Cell: (208) 520-4644 24-hour emergency phone: (208) 520-4644
Utilities Emergency Water: Charles Davenport, 353-7139 Gas: Charles Davenport, 353-7139 Electric: Charles Davenport, 353-7139	Health and Safety Manager (HSM) Name: Bruce Miller Phone: (208) 528-8718 Cell: (208) 520-4644
Site Safety & Health Officer (SSHO) Name: Dan McGauhey Phone: (907) 441-7750 Cell: 208-521-9928	Corporate Human Resources Department Name: Tara Gartrell Phone: (208) 557-7912
Project Manager Name: Aran Armstrong Cell: (9907) 322-4736	Worker’s Compensation and Auto Claims Initial Claims: Tara Gartrell Phone: (208) 557-7912 After hours: (208) 522-7953 Report fatalities AND report vehicular accidents involving pedestrians, motorcycles, or more than two cars.
Federal Express Dangerous Goods Shipping Phone: (800) 238-5355 North Wind Emergency Number for Shipping Dangerous Goods Phone: (208) 528-8718	Worker’s Compensation and Auto Claims Fremont industrial Indemnity Phone: (907) 762-6700 Report fatalities AND report vehicular accidents involving pedestrians, motorcycles, or more than two cars.
Contact the Project Manager. Generally, the Project Manager will contact relevant government agencies.	
Facility Alarms: -NA	Evacuation Assembly Area(s): On-site and offsite assembly points will be designated before work begins
Facility/Site Evacuation Route(s): Evacuation routes will be designated by the SSHO before work begins.	
Hospital Name/Address: Fairbanks Memorial Hospital	Hospital Phone #: 911 458-5555 (Non-emergency)
Directions to Hospital: Figure 2 on the following page presents routes to Hospital.	

13.4 Emergency Medical Treatment

Medical support and emergencies are addressed in Section 7. Directions to the Fairbanks Memorial Hospital from Ft. Wainwright are provided below.

Fairbanks Memorial Hospital - Emergency Department (1st Floor Emergency Entrance)
1650 Cowles Street, Fairbanks, AK 99701
(907) 458-5555

From Taku Project South Gate:

1. Take Right (West) on Alder Ave. and travel to 9th Ave.
2. Take Right (North) on 9th Ave. and travel to Gaffney Rd.
3. Take Left (West) on Gaffney and exit out main post gate and continue on Airport way (West) to Cowles St.
4. Take Left (South) on Cowles St. and continue to Emergency Entrance of Fairbanks Memorial Hospital

From Taku Project Area North Gate:

1. Take Left (West) on Neely Rd. and travel to 9th Ave.
2. Take Right (North) on 9th Ave. and travel to Gaffney Rd.
3. Take Left (West) on Gaffney and exit out main post gate and continue on Airport way (West) to Cowles St.
4. Take Left (South) on Cowles St. and continue to Emergency Entrance of Fairbanks Memorial Hospital.

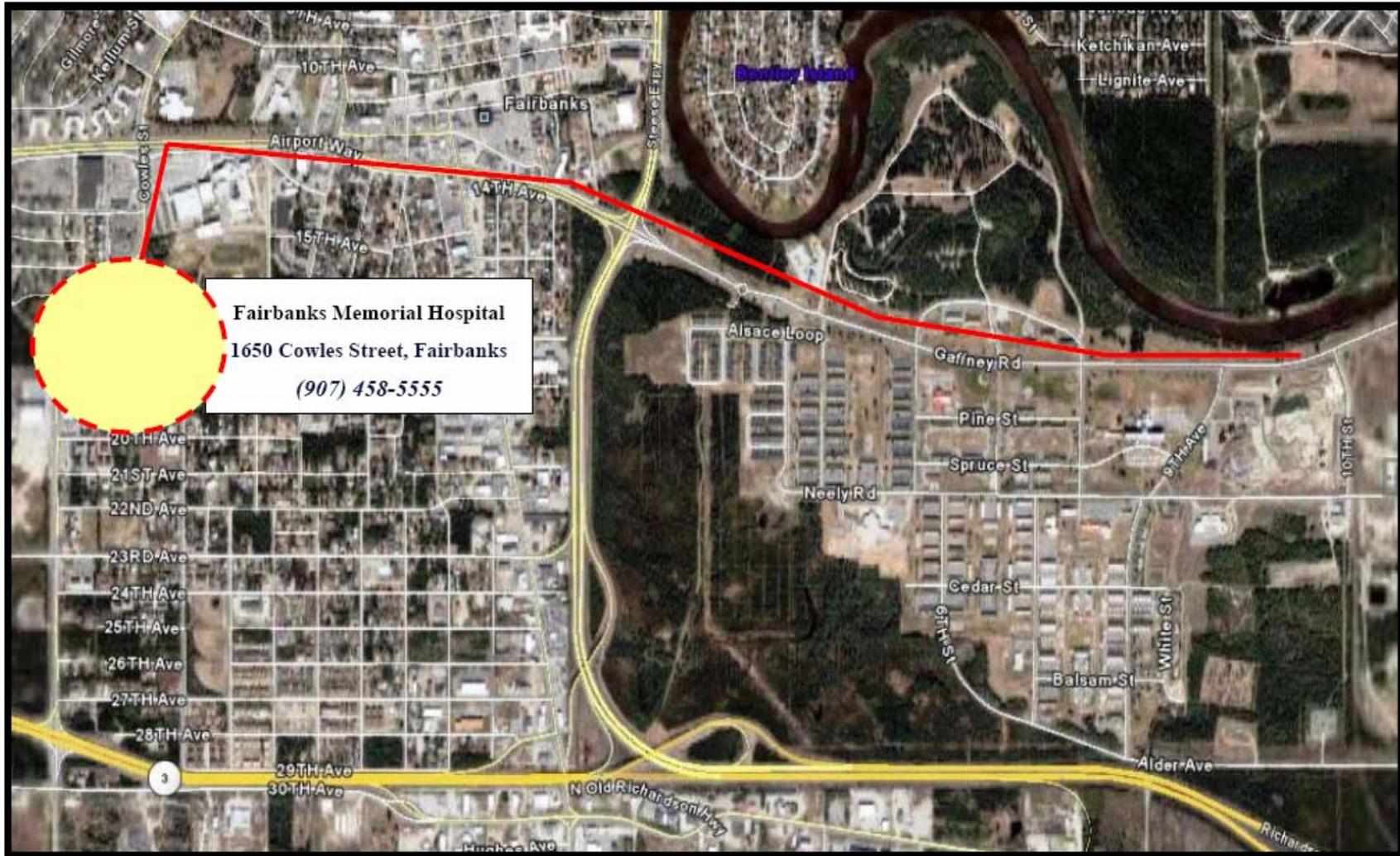


Figure 4 Map from Ft. Wainwright to Fairbanks Memorial Hospital.

13.5 Evacuation

- ◆ Evacuation routes and assembly areas (and alternative routes and assembly areas) are specified on the site map.
- ◆ The SSHO will designate evacuation route(s) and assembly area(s) before work begins.
- ◆ Personnel will assemble at the assembly area(s) upon hearing the emergency signal for evacuation.
- ◆ The SSHO and a “buddy” will remain on site after the site has been evacuated (if safe) to assist local responders and advise them of the nature and location of the incident.
- ◆ The SSHO will account for all personnel in the on-site assembly area using the tailgate safety briefing form or equivalent site roster.
- ◆ A designated person will account for personnel at alternate assembly area(s).
- ◆ The SSHO will write up the incident as soon as possible after it occurs and submit a report to the NWI PM and HSM.

13.6 Evacuation Signals

Table 17 presents the evacuation signals that should be used during normal work activities and emergency situations.

Table 17 Evacuation Signals.

Signal	Meaning
Grasping throat with hand	Emergency-help me.
Thumbs up	OK; understood.
Grasping buddy’s wrist	Leave area now.
Continuous sounding of air/vehicle horn	Emergency; leave site now.

13.7 Incident Notification and Reporting

- ◆ Upon any project incident (i.e., fire, spill, injury, near miss, or death), immediately notify the PM and HSM.
- ◆ For NWI work-related injuries or illnesses, contact and help the Human Resources administrator complete an Incident Report Form (Form 520). The form must be completed within 24 hours of the incident.
- ◆ For NWI's subcontractor incidents, complete the Subcontractor Accident/Illness Report Form and submit to NWI Human Resources director.
- ◆ Notify and submit reports to client, as required by the applicable contract.

13.8 Reentry, Recovery, and Site Control

All reentry and recovery activities will follow general Site security and control requirements identified in Section 11 unless conducted as part of an emergency response action. All entries into project areas performed in support of emergency actions will be controlled by the on-scene commander.

13.8.1 Reentry

During an emergency response it is sometimes necessary to reenter the scene of the event. Reasons for performing a reentry may include:

- ◆ Performing personnel search and rescues
- ◆ Responding to medical first-aid needs
- ◆ Performing safe shutdown actions of operational equipment or processes
- ◆ Performing mitigating actions
- ◆ Evaluating and preparing damage reports
- ◆ Performing radiation or hazardous material surveys.

Reentries will be carefully planned to ensure that personnel are protected from harm and to prevent initiating another emergency event. Reentry planning is undertaken on a graded approach and will be based on the nature of the initiating event, hazards to personnel and structures, and purpose for the reentry.

13.8.2 Recovery

After the initial corrective actions have been taken and effective control established, response efforts will shift toward recovery. Recovery is the process of (1) assessing post-event and post-emergency conditions, (2) developing a plan for returning to pre-event and pre-emergency operating conditions, when possible, and (3) following the plan to completion. The NWI PM, in consultation with the NWI HSM, DPW, U.S. Army Garrison, Alaska (USAGAK), USACE, and other parties are responsible for determining when an emergency situation is sufficiently stable to terminate the emergency and enter the recovery phase. The NWI PM will serve as the recovery manager. Where a restart of project activities is required following a shutdown.

13.9 Critique of Response and Follow-up

A review and critique will be conducted following all emergency events, drills, and exercises at the FTW site. In some cases, an investigation may be required before commencing recovery actions. For this reason care should be exercised to preserve evidence when appropriate. The PM in conjunction with the NWI HSM, DPW, USAGAK, and USACE personnel will lead all critiques of project events leading up to the event.

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14.0 REFERENCES

- 29 CFR 1910, "Occupational Safety and Health Administration," *Code of Federal Regulations*, Office of the Federal Register.
- 29 CFR 1926, "Safety and Health Regulations for Construction," *Code of Federal Regulations*, Office of the Federal Register.
- 40 CFR 112, 2002, Title 40, "Protection of Environment," Part 112, "Oil Pollution Prevention," *Code of Federal Regulations*, Office of the Federal Register.
- 49 CFR 171, 2002, Title 49, "Transportation," Part 171, "General Information, Regulations, and Definitions," *Code of Federal Regulations*, Office of the Federal Register.
- EP 75-1-2, "Munitions and Explosives of Concern (MEC) Support During Hazardous, Toxic, and Radioactive Waste (HTRW) and Construction Activities."
- USACE, Engineer Manual (EM) 385-1-1, "Safety and Health Requirements Manual," U.S. Army Corps of Engineers, September 3, 1996.
- USACE, Engineer Regulation (ER) 385-1-92, "Safety and Occupational Health Requirements for Hazardous, Toxic, and Radioactive Waste (HTRW) Activities," U.S. Army Corps of Engineers, September 1, 2001.

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15.0 ATTACHMENTS

Attachment 1	Training Acknowledgement Form
Attachment 2	Job Safety Analysis
Attachment 3	Dig Clearance Form
Attachment 4	Project Specific Chemical Hazard Communication Form/Material Safety Data Sheets
Attachment 5	Radiological Response Check Form
Attachment 6	Radiological Personal Surveys

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NORTH WIND, INC.
SAFETY AND HEALTH PLAN
ATTACHMENT 1
TRAINING ACKNOWLEDGEMENT FORM

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NORTH WIND, INC.
SAFETY AND HEALTH PLAN
ATTACHMENT 2
JOB SAFETY ANALYSIS

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JOB SAFETY ANALYSIS

Job Name	FTW Stryker Brigade Cantonment Areas Project	Effective Date	6/10/2006	JSA Number	FTW-STRYK-2006-002	Revision	0
Job Site	FTW Stryker Brigade Cantonment Areas at Ft. Wainwright Project Areas	Expiration Date	6/10/2008	Approved By	B. Miller, CIH, Project HSM		
				Project Mgr.	A. Armstrong		
				SSO	D. McGauhey		
Job Description	FTW Stryker Brigade Cantonment Area Project Tasks associated with SSHP						
Required Training	<p>Stryker APP, Ft. Wainwright SSHP</p> <p>This JSA</p> <p>HAZWOPER 40-Hour Training (as required by individual SSHP and as posted)</p> <p>HAZWOPER 24-Hour Training (as required by individual SSHP and as posted)</p> <p>Construction Area (for specific construction project area entered)</p> <p>PPE per 29 CFR 1910.132 for PPE to be worn</p>						
Required PPE	<p>Level D - MINIMUM REQUIREMENT (standard work clothing, sturdy leather boots, safety glasses, and hard hat as posted and where overhead hazards exist and in posted construction areas)</p> <p>Modified Level D (as required by individual SSHP for specific tasks or when entering contaminated areas, see task-specific PPE)</p> <p>Level C (as required by individual SSHP for specific tasks or when action levels are exceeded, see task-specific PPE)</p> <p>Level B (as a contingency only. HSM to determine appropriate Level B PPE on a case-by-case basis)</p> <p>PPE Component Design Standards/Criteria:</p> <ul style="list-style-type: none"> • Eye and Face Protection: 29 CFR 1910.133, ANSI Z87.1-2003 • Foot Protection: 29 CFR 1910.136, ANSI Z41-1991 (minimum requirement - study leather boots above the ankle or equivalent) • Head Protection: 29 CFR 1910.135, ANSI Z89.1-1986 • Hand Protection: 29 CFR 1910.138 • High visibility vest or equivalent (reflective vest if working before or after daylight hours) • Respiratory Protection: 29 CFR 1910.134, (per individual SSHP based on airborne contaminant(s) concentration) <p>This JSA serves a written hazard assessment in accordance with 29 CFR 1910.132</p>						



JOB SAFETY ANALYSIS

Activity No.	Discrete Activities or Subtask	Potential Hazards	Hazard Control/PPE
1	Surface Soil Sample with auger or hand trowels	<ol style="list-style-type: none"> 1. Slip and Fall 2. Backstrain 3. Overhead hazards 4. Heat/Cold Stress 5. Pinch Points 6. PCB/Contaminants 7. MEC/UXO 	<ol style="list-style-type: none"> 1. Identify slip and fall hazards such as open excavations, uneven slopes and terrain, construction materials and debris on ground surface, observe ground when carrying materials, wear footwear with adequate tread. 2. Use mechanical lifting devices where possible, two person lifting if object exceeds 50 pounds or is awkward, do not exceed maximum manual lifting limit of 50 pounds or 1/3 person's body weight (whichever is less). 3. Wear hard hat when using extensions for augers. 4. Site supervisor or lead will check forecast and brief at pre-job briefing, wear adequate clothing including water proof outer garments, take warm-up/cool down breaks as needed, take breaks in temperature conditioned area, stay hydrated, SSHO to monitor workers for signs and symptoms of heat/cold stress in accordance with FTW SSHP. 5. Wear leather gloves for material handling tasks, body position awareness, avoid placing hands under or between equipment or loads in motion. 6. Identify areas of high contamination, avoid direct contact with contaminated soil through use of PPE, keep soil wet to reduce airborne dusts and particulates, monitoring airborne contaminants, use standard SSHP decontamination techniques. 7. UXO awareness training and UXO construction support for areas of potential concern. <p>PPE: <u>Modified Level D:</u> Including Tyvek or equivalent protective clothing, nitrile rubber gloves, rubber overboots.</p> <p>Level C: (Contingency only if airborne dust levels can not be controls by wetting).</p>
2	Collecting Surface Wipe Samples	<ol style="list-style-type: none"> 1. Slip and Fall 2. Heat/Cold Stress 3. PCB/Hexane for Wipes 	<ol style="list-style-type: none"> 1. Identify slip and fall hazards such as open excavations, uneven slopes and terrain, construction materials and debris on ground surface, observe ground when carrying materials, wear footwear with adequate tread. 2. Site supervisor or lead will check forecast and brief at pre-job briefing, wear adequate clothing including water proof outer garments, take warm-up/cool down breaks as needed, take breaks in temperature conditioned area, stay hydrated, SSHO to monitor workers for signs and symptoms of heat/cold stress in accordance with FTW SSHP. 3. Identify areas of high contamination, avoid direct contact with contaminated soil through use of PPE, keep soil wet to reduce airborne dusts and particulates. Wear nitrile glove when collecting and handling hexane saturated wipes. <p>PPE: <u>Level D:</u> With nitrile gloves and overboots when collecting samples in contaminated soil areas.</p>



JOB SAFETY ANALYSIS

Activity No.	Discrete Activities or Subtask	Potential Hazards	Hazard Control/PPE
3	Soil Sampling with Powered Hand Auger	<ol style="list-style-type: none"> 1. Slip and Fall 2. Backstrain 3. Heat/Cold Stress 4. Pinch Points/Rotating Parts 5. PCB/Contamination 6. Gasoline Mix 7. High Noise Levels 8. Underground Utilities 9. MEC/UXO 	<ol style="list-style-type: none"> 1. Identify slip and fall hazards such as open excavations, uneven slopes and terrain, construction materials and debris on ground surface, observe ground when carrying materials, wear footwear with adequate tread. 2. Use mechanical lifting devices where possible, two person lifting if auger exceeds 50 pounds or is awkward, do not exceed maximum manual lifting limit of 50 pounds or 1/3 person's body weight (whichever is less). 3. Site supervisor or lead will check forecast and brief at pre-job briefing, wear adequate clothing including water proof outer garments, take warm-up breaks as needed, stay hydrated, monitor other workers for signs and symptoms of cold stress in accordance with FTW Soils SSHP. 4. Wear leather gloves for material handling tasks, body position awareness, stay away from auger when operating, move or shut down auger before collecting samples. No loose clothing around operating auger. 5. Identify areas of high contamination, avoid direct contact with contaminated soil through use of PPE, keep soil wet to reduce airborne dusts and particulates, monitoring airborne contaminants, use standard decontamination techniques. 6. Avoid contact with gasoline mix when fueling auger, let auger cool before filling and remove any ignition sources from area, position body upwind during fueling task. 7. Wear hearing protection when operating or near powered hand auger. 8. Obtain utility clearances or locates from Ft. Wainwright and construction contractor before auging below 12 inches for all sampling locations. 9. UXO awareness training and UXO construction support for areas of potential concern. <p>PPE: <u>Modified Level D:</u> Including Tyvek or equivalent protective clothing, nitrile rubber gloves, rubber overboots.</p> <p>Level C: (Contingency only if airborne dust levels can not be controls by wetting).</p>
4	Collect Subsurface Soil and Water Samples and install Monitoring Wells with AMS Drilling Rigs (Tracked and PowerProbe) or equivalent HSA Rig	<ol style="list-style-type: none"> 1. Slip and Fall 2. Overhead Hazards 3. Backstrain 4. Heat/Cold Stress 5. Pinch Points/Rotating Parts 	<ol style="list-style-type: none"> 1. Identify slip and fall hazards such as open excavations, uneven slopes and terrain, construction materials and debris on ground surface, observe ground when carrying materials, wear footwear with adequate tread. 2. Wear hard hat and be aware of body position. 3. Use rig mechanical lifting devices where possible, two person lifting if object exceeds 50 pounds or is awkward, do not exceed maximum manual lifting limit of 50 pounds or 1/3 person's body weight (whichever is less).



JOB SAFETY ANALYSIS

Activity No.	Discrete Activities or Subtask	Potential Hazards	Hazard Control/PPE
		6. Caught-between/Struck-by 7. PCB/Contamination 8. Radioactive materials 9. Refueling 10. High Noise Levels 11. Underground/Overhead Utilities 12. MEC/UXO	4. Site supervisor or lead will check forecast and brief at pre-job briefing, wear adequate clothing including water proof outer garments, take warm-up/cool down breaks as needed, take breaks in temperature conditioned area, stay hydrated, SSHO to monitor workers for signs and symptoms of heat/cold stress in accordance with FTW SSHP. 5. Follow drill rig JSA, wear leather gloves for material handling tasks, body position awareness, stay away from head when advancing/removing flights, no loose clothing or hair near rotating parts. 6. Use spotter for backing PowerProbe, wear high visibility reflective vests, only the operator and helper near rig during operations, qualified operator and helper, stage/stack tooling in racks and secure configuration. 7. Identify areas of high contamination, avoid direct contact with contaminated soil through use of PPE, keep soil wet to reduce airborne dusts and particulates, monitoring airborne contaminants, use standard decontamination techniques. 8. Conduct monitoring of suspected debris and material encountered with GM instrument, isolate and report any radioactive materials or environmental media encountered to PM. 9. Avoid contact with fuel when fueling rigs, shut off rig and allow to cool before fueling, and remove any ignition sources from area, position body upwind during fueling task. 10. Wear hearing protection when operating or near powered hand auger. 11. Obtain utility clearances or locates from Ft. Wainwright and construction contractor before drilling sampling locations, observe minimum clearances from overhead power lines when operating PowerProbe. 12. UXO awareness training and UXO construction support for areas of potential concern. PPE: <u>Modified Level D:</u> Including Tyvek or equivalent protective clothing, nitrile rubber gloves, rubber overboots, hearing protection, hard hats. Level C: (Contingency only if airborne dust levels can not be controls by wetting).
5	Trenching and Excavation, Contaminated Soil and Media Handling	1. Slip and Fall 2. Overhead Hazards 3. Backstrain 4. Heat/Cold Stress 5. Pinch Points/Rotating Parts	1. Identify slip and fall hazards such as open excavations, uneven slopes and terrain, construction materials and debris on ground surface, observe ground when carrying materials, wear footwear with adequate tread. 2. Wear hard hat and be aware of body position. 3. Use rig mechanical lifting devices where possible, two person lifting if object exceeds 50 pounds or is awkward, do not exceed maximum manual lifting limit of 50 pounds or 1/3 person's body weight (whichever is less).



JOB SAFETY ANALYSIS

Activity No.	Discrete Activities or Subtask	Potential Hazards	Hazard Control/PPE
		6. Caught-between/Struck-by 7. PCB/Contamination 8. Radioactive Materials 9. Refueling 10. High Noise Levels 11. Underground/Overhead Utilities 12. MEC/UXO	4. Site supervisor or lead will check forecast and brief at pre-job briefing, wear adequate clothing including water proof outer garments, take warm-up/cool down breaks as needed, take breaks in temperature conditioned area, stay hydrated, SSHO to monitor workers for signs and symptoms of heat/cold stress in accordance with FTW SSHP. 5. Follow drill rig JSA, wear leather gloves for material handling tasks, body position awareness, stay away from head when advancing/removing flights, no loose clothing or hair near rotating parts. 6. Use spotter for backing PowerProbe, wear high visibility reflective vests, only the operator and helper near rig during operations, qualified operator and helper, stage/stack tooling in racks and secure configuration. 7. Identify areas of high contamination, avoid direct contact with contaminated soil through use of PPE, keep soil wet to reduce airborne dusts and particulates, monitoring airborne contaminants, use standard decontamination techniques. 8. Conduct monitoring of suspected debris and material encountered with GM instrument, isolate and report any radioactive materials or environmental media encountered to PM. 9. Avoid contact with fuel when fueling rigs, shut off rig and allow to cool before fueling and remove any ignition sources from area, position body upwind during fueling task. 10. Wear hearing protection when operating or near powered hand auger. 11. Obtain utility clearances or locates from Ft. Wainwright and construction contractor before drilling sampling locations, observe minimum clearances from overhead power lines when operating PowerProbe. 12. UXO awareness training and UXO construction support or anomaly avoidance as required for areas of potential concern. PPE: <u>Modified Level D:</u> Including Tyvek or equivalent protective clothing, nitrile rubber gloves, rubber overboots, hearing protection, hard hats. Level C: (Contingency only if airborne dust levels can not be controls by wetting or action level are exceeded).
6	Sampling, Packaging, Overpacking, transporting, and disposal of Contaminated (or potentially Contaminated) waste, debris, and media	1. Slip and Fall 2. Overhead Hazards 3. Backstrain 4. Heat/Cold Stress 5. Pinch Points	1. Identify slip and fall hazards such as open excavations, uneven slopes and terrain, construction materials and debris on ground surface, observe ground when carrying materials, wear footwear with adequate tread. 2. Wear hard hat and be aware of body position. 3. Use rig mechanical lifting devices where possible, two person lifting if object exceeds 50 pounds or is awkward, do not exceed maximum manual lifting limit of 50 pounds or 1/3 person's body weight (whichever is less).



JOB SAFETY ANALYSIS

Activity No.	Discrete Activities or Subtask	Potential Hazards	Hazard Control/PPE
		6. PCB/Contamination 7. Radioactive Materials 8. High Noise Levels 9. MEC/UXO	4. Site supervisor or lead will check forecast and brief at pre-job briefing, wear adequate clothing including water proof outer garments, take warm-up/cool down breaks as needed, take breaks in temperature conditioned area, stay hydrated, SSHO to monitor workers for signs and symptoms of heat/cold stress in accordance with FTW SSHP. 5. Wear required PPE for material handling tasks, use lifting devices for loading and handling materials where feasible. 6. Identify areas of high contamination, avoid direct contact with contaminated soil through use of PPE, keep soil wet to reduce airborne dusts and particulates, monitoring airborne contaminants, use standard decontamination techniques. 7. Conduct monitoring of suspected debris and material encountered with GM instrument, isolate and report any radioactive materials or environmental media encountered to PM. 8. Wear hearing protection when operating or near powered hand auger. 9. UXO awareness training and UXO construction support or anomaly avoidance as required for areas of potential concern. PPE: <u>Modified Level D:</u> Including Tyvek or equivalent protective clothing, nitrile rubber gloves, rubber overboots, hearing protection, hard hats. Level C: (Contingency only if airborne dust levels can not be controls by wetting or action levels are exceeded.
7	General Site Monitoring and Sampling	1. Slip and Fall 2. Heat/Cold Stress 3. PCB/Contamination 4. Radioactive Materials	1. Identify slip and fall hazards such as open excavations, uneven slopes and terrain, construction materials and debris on ground surface, observe ground when carrying materials, wear footwear with adequate tread. 2. Site supervisor or lead will check forecast and brief at pre-job briefing, wear adequate clothing including water proof outer garments, take warm-up breaks as needed, stay hydrated, monitor other workers for signs and symptoms of cold stress in accordance with FTW Soils SSHP. 3. Identify areas of high contamination, avoid direct contact with contaminated soil through use of PPE, keep soil wet to reduce airborne dusts and particulates, monitoring airborne contaminants. 4. Conduct monitoring of suspected debris and material encountered with GM instrument, isolate and report any radioactive materials or environmental media encountered to PM. PPE: <u>Level D:</u> With nitrile gloves and overboots when collecting samples in contaminated soil areas.



JOB SAFETY ANALYSIS

Activity No.	Discrete Activities or Subtask	Potential Hazards	Hazard Control/PPE
8	Miscellaneous Site Support Tasks	<ol style="list-style-type: none"> 1. Slip and Fall 2. Heat/Cold Stress 3. PCB/Contamination (in contaminated site areas only) 	<ol style="list-style-type: none"> 1. Identify slip and fall hazards such as open excavations, uneven slopes and terrain, construction materials and debris on ground surface, observe ground when carrying materials, wear footwear with adequate tread. 2. Site supervisor or lead will check forecast and brief at pre-job briefing, wear adequate clothing including water proof outer garments, take warm-up/cool down breaks as needed, take breaks in temperature conditioned area, stay hydrated, SSHO to monitor workers for signs and symptoms of heat/cold stress in accordance with FTW SSHP. 3. Identify areas of high contamination, avoid direct contact with contaminated soil through use of PPE, keep soil wet to reduce airborne dusts and particulates, monitoring airborne contaminants. <p>PPE: <u>Level D</u>: With nitrile gloves and overboots when collecting samples in contaminated soil areas.</p>
9	General Support Tasks	Hazards specified in APP AHA (FTW-STRYK-2006-001)	Hazard controls specified in APP AHA (FTW-STRYK-2006-001)

NORTH WIND, INC.
SAFETY AND HEALTH PLAN
ATTACHMENT 3
DIG CLEARANCE FORM

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DIG CLEARANCE
DIRECTORATE OF PUBLIC WORKS, FORT WAINWRIGHT, ALASKA
(updated 01 June 2005)
NOTE: Locates require 72-hour notice
(Except where indicated)

Request clearance to proceed with work at _____
(Specific location)

Work Order/Contract #: _____ Contractor: _____ POC Name/Phone: _____
(This information is MANDATORY)

TYPE OF WORK REQUIRED: (provide brief but complete description of work to be performed)

Project Dates: _____ thru _____ Above Excavation Checked for Conflicts with the Following:

Department	Conflict	Signing Official	Date
Facility Management Specialist (Electric), Bldg 3015 353-6172 (Buried Electric)	Yes No	_____	_____
Alarm Controls, Bldg 3022 (East) 353-6254 (Alarms)	Yes No	_____	_____
Utility Distribution, Bldg 3022 (West) 353-7139 (Steam, Water, Sewer)	Yes No	_____	_____
High Voltage, Bldg 3022 (West) 353-7139 (Overhead Power Lines)	Yes No	_____	_____
Roads & Grounds, Bldg 3021 (West) 353-6056	Yes No	_____	_____
Environmental, Bldg 3023 353-9686	Yes No	_____	_____
Fire Dept, Bldg 1054 353-9166 (Use of Hydrant Sys/Road Closure)	Yes No	_____	_____
Telephone System, Bldg 1060 353-6101 (507 th Signal Co)	Yes No	_____	_____
Alaska Dig Line (PTI) 1-800-478-3121 (48 hour notice required)	Yes No	_____	_____
**Other _____	Yes No	_____	_____
**Other _____	Yes No	_____	_____

Explanation of Conflicts Identified Above (annotate on drawings):

****If Required:**
Alaska Railroad - If excavating within 100 feet of railroad right of way: 907-265-2465 (10 day notice required)
Ammunition Areas, Bldg 1900 & 2200: 353-6440 (Security Only)
Provost Marshall, Bldg 3028: 353-7535 (Road Closure Only)
Customer Service Desk, Bldg 3015: 353-7069 (Utility Outages Only)

Special Requirements Note:

INSTITUTIONAL CONTROLS AREA - POTENTIALLY CONTAMINATED AREA, SPECIAL PRECAUTIONS APPLY - SEE SOP and NOTE REQUIREMENTS #6 AND #7 BELOW

- This clearance authorizes commencement of excavation work only and is not a notice to proceed or work authorization.
 - This excavation clearance is effective upon the date of signature by DPW official below; EXCAVATION SHALL COMMENCE WITHIN 30 CALENDAR DAYS.
 - Requester will provide two (2) copies of required work site drawings with excavation clearance request. DPW will retain one (1) copy of these drawings.
 - Requester will retain original completed excavation clearance request onsite during excavation activities. DPW will retain one (1) copy of the request.
 - Boring locations must be marked on a 1/100 scale drawing.
 - All soil to be removed from the work site shall be disposed of in accordance with guidance from the DPW Environmental Resources Department.
 - An after action report (AAR) concerning work at sites where institutional controls are in place shall be submitted to DPW Environmental Resources Department NLT 30 days following completion of work.
- ***HOURS FOR SIGNATURE OF WORK REQUEST ORDERS: 3:30 TO 4:30, MONDAY, WEDNESDAY, THURSDAY, AND FRIDAY ONLY*****

Requester's Signature _____ Date _____ APPROVED: _____ Ed Chacho, Facility Management

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NORTH WIND, INC.
SAFETY AND HEALTH PLAN
ATTACHMENT 4
PROJECT SPECIFIC CHEMICAL PRODUCT HAZARD COMMUNICATION
FORM/MATERIAL SAFETY DATA SHEETS

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PROJECT-SPECIFIC CHEMICAL PRODUCT HAZARD COMMUNICATION FORM

Site Specific Safety and Health Plan

This form must be completed prior to performing activities that expose personnel to hazardous chemicals products. Upon completion of this form, the SSHO shall verify that training is provided on the hazards associated with these chemicals and the control measures to be used to prevent exposure to North Wind and subcontractor personnel. Labeling and MSDS systems will also be explained.

**Project
Name:**

**Project
Number:**

MSDSs will be maintained on-site in a field copy of the SSHP.

HAZARDOUS CHEMICAL PRODUCTS INVENTORY

Chemical	Quantity	Location	MSDS Available	Container Labels	
				Identity	Hazard
Methane	1 liter, compressed	Support Zone	Y		
Isobutylene	1 liter, compressed	Support Zone	Y		
Pentane	1 liter, compressed	Support Zone	Y		
Hydrochloric acid	< 500 ml	Support Zone/sample bottles	Y		
Nitric acid	< 500 ml	Support Zone/sample bottles	Y		
Sulfuric Acid	< 500 ml	Support Zone/sample bottles	Y		
Sodium hydroxide	< 500 ml	Support Zone/sample bottles	Y		
Methanol	< 1 Gallon	Support/Decon Zones	Y		
Alconox/Liquinox	< 1liter	Support/Decon Zones	Y		
Diesel	<200 gal	Support/Decon Zones	Y		
Petroleum lubricants	< 10 gal	Support/Decon Zones	Y		
Bentonite	<500 lbs	Support/Decon Zones	Y		

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**NORTH WIND, INC.
SAFETY AND HEALTH PLAN**

ATTACHMENT 5

RADIOLOGICAL INSTRUEMNT RESPONSE CHECK FORM

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Ludlum Model 12 Survey Rate Meter Operational Check Instruction

To check the operation of a Ludlum Model 12 meter with a 44-9 GM probe:

Check battery -

- Turn the switch on the ratemeter to "BATT" or flip the "BATT" switch to "ON."
- The needle on the meter face should move to a position within or beyond the indicated area on the meter face scale.
- Replace batteries (if needed) before use of the ratemeter.

Check cable. Connections and Probe –

- Visually examine all cables and connections to ensure the detectors and meters are properly communicating.
- Examine all membranes to verify there are no pin holes or other damaged areas.

Check speaker -

- If there is an audio switch on the ratemeter, turn it to "ON."
- Set the ratemeter to a scale of "X1."
- The ratemeter should "chirp" or "click."
- If the speaker does not function, the survey meter can be used; however, the surveyor will need to check the reading on the ratemeter face frequently.

Check background -

- Go to an area with an expected low background rate.
- Note the count rate when the ratemeter is switched to the "X1" scale.
- The background rate will vary from as little to 10 counts per minute up to several hundred counts per minute.
- Do not use the survey meter if it does not register a background rate.

Check probe -

- Set the ratemeter to a scale of "X100."
- Hold the supplied check source (Cs-137 sealed source) up to the probe window.
- Note the counting rate.
- Do not use the survey meter if the cpm registered does not fall within +/- 10% of the expected reading for that check source (based on the initial established instrument response).

Radiological Response Check Form

Ludlum 12 survey meter undergo an operational check annually in-house using a Cs-137 source.

RADIATION MONITOR OPERATIONAL VERIFICATION

CALIBRATION SOURCE = Cs-137 Sealed Source

DATE: _____

INSTRUMENT and PROBE			OPERATIONAL CHECK AND PARAMETERS				
MFR/Model	S/N	Probe Type/Model	Battery check (Pass/Fail)	Cable and Connectors No damage	Background Response on X0.1 Scale (Pass/Fail)	On contact X100 (w/i 10%) (Pass/Fail)	Initials
Ludlum 12		Ludlum 44-9	Pass/Fail		Pass/Fail	Pass/Fail	
			Pass/Fail		Pass/Fail	Pass/Fail	
			Pass/Fail		Pass/Fail	Pass/Fail	
			Pass/Fail		Pass/Fail	Pass/Fail	
			Pass/Fail		Pass/Fail	Pass/Fail	
			Pass/Fail		Pass/Fail	Pass/Fail	
			Pass/Fail		Pass/Fail	Pass/Fail	
			Pass/Fail		Pass/Fail	Pass/Fail	
			Pass/Fail		Pass/Fail	Pass/Fail	
			Pass/Fail		Pass/Fail	Pass/Fail	
			Pass/Fail		Pass/Fail	Pass/Fail	
			Pass/Fail		Pass/Fail	Pass/Fail	
			Pass/Fail		Pass/Fail	Pass/Fail	

Ludlum Model 12 Survey Rate Meter General Specifications:



COMPATIBLE DETECTORS: G-M, proportional, scintillation

METER DIAL: 0 - 500 cpm, 0 - 2.5 kV, BAT TEST (*others available*)

MULTIPLIERS: X1, X10, X100, X1000

LINEARITY: Reading within plus or minus 10% of true value with detector connected

CONNECTOR: Series "C" (*others available*)

AUDIO: Built in unimorph speaker with ON/OFF switch (*greater than 60 dB at 2 feet*)

CALIBRATION CONTROLS: Accessible from front of instrument (*protective cover provided*)

HIGH VOLTAGE: Adjustable from 200 – 2,500 volts (*can be read on meter*)

DISCRIMINATOR: Adjustable from 1 - 100 mV

RESPONSE: Toggle switch for FAST (4 seconds) or SLOW (22 seconds) from 10% to 90% of final reading

RESET: Push-button to zero meter

POWER: 2 each "D" cell batteries (*housed in sealed compartment that is externally accessible*)

BATTERY LIFE: Typically 2000 hours with alkaline batteries (*battery condition can be checked on meter*)

METER: 2.5" (6.4 cm) arc, 1 mA analog type

CONSTRUCTION: Cast and drawn aluminum with beige powdercoat

TEMPERATURE RANGE: -4°F (-20° C) to 122°F (50° C)

May be certified for operation from -40° F(-40° C) to 150° F(65° C)

SIZE: 6.5" (16.5 cm) H X 3.5" (8.9 cm)W X 8.5" (21.6 cm) L

WEIGHT: 3.5 lbs (1.6 kg) including batteries

Ludlum Model 44-9 Pancake G-M Detector General Specifications:



INDICATED USE: Alpha beta gamma survey; Frisking

DETECTOR: Pancake type halogen quenched G-M

WINDOW: 1.7 plus or minus 0.3 mg/cm² mica

WINDOW AREA: Active - 15 cm² Open - 12 cm²

EFFICIENCY(4pi geometry): Typically 5%-C-14; 22%-Sr-90/Y-90; 19%-Tc-99; 32%-P-32; 15%-Pu-239

SENSITIVITY: Typically 3300 cpm/mR/hr (*Cs-137 gamma*)

ENERGY RESPONSE: Energy dependent

DEAD TIME: Typically 80 microseconds

COMPATIBLE INSTRUMENTS: General purpose survey meters, ratemeters, and scalers

OPERATING VOLTAGE: 900 volts

CONNECTOR: Series "C" (*others available*)

CONSTRUCTION: Aluminum housing with beige polyurethane enamel paint

TEMPERATURE RANGE: -4° F(-20° C) to 122° F(50° C)

May be certified for operation from -40° F(-40° C) to 150° F(65° C)

SIZE: 1.8" (4.6 cm)H X 2.7" (6.9 cm)W X 10.7" (27.2 cm)L

WEIGHT: 1 lb (0.5kg)

NORTH WIND, INC.
SAFETY AND HEALTH PLAN
ATTACHMENT 6
RADIOLOGICAL PERSONAL SURVEYS

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CONDUCTING PERSONAL CONTAMINATION SURVEYS

The following instructions will be used to conduct personal radiological surveys with a GM instrument (Ludlum Model 3 with a 44-9 pancake probe or equivalent) for personnel in the immediate vicinity if radioactive materials are encountered during intrusive activities. The SSHO will provide additional guidance and the HSM will serve as technical resource for radiological hazard questions.

- ◆ Verify that the instrument is in service, set to the proper scale, and the audio output can be heard during frisking.
- ◆ Hold probe less than ½ in. from surface being surveyed for beta and gamma contamination, approximately ¼ in. for alpha contamination (without touching surface).
- ◆ Move probe slowly over surface, approximately 2 in. per second for beta-gamma probe and 1 in. per second for alpha probe.
- ◆ If the count increases during frisking, pause 5 to 10 seconds over the area to provide adequate time for instrument response.
- ◆ If the count rate increases to a value greater than **100 cpm above background with a beta-gamma instrument or any detectable contamination with an alpha detection instrument**, remain in area and notify (or have someone notify) SSHO.
- ◆ Whole body survey should take approximately 2 to 3 minutes to complete; remember to frisk hands before picking up probe and perform the survey in the following order:
 - Head (pause at mouth and nose for approximately 5 seconds) ensuring the entire respirator facepiece sealing surface area of face is surveyed (if worn)
 - Neck and shoulders
 - Arms (pause at each elbow)
 - Chest and abdomen
 - Back, hips, and seat of pants
 - Legs (pause at each knee)
 - Shoe tops
 - Shoe bottoms (pause at sole and heel)
 - Return probe to holder, facing up.
- ◆ Project materials and equipment found to have radiological contamination will be isolated and segregated, where this can be accomplished, without contacting the contaminated article (to the extent possible without directly touching the object). Any radiological decontamination will require a separate radiological work permit and additional controls.

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