



CONSOLIDATED GM BEDFORD HEALTH AND SAFETY PLAN (HASP)

**GM POWERTRAIN BEDFORD FACILITY
BEDFORD, INDIANA**

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LIST OF ACRONYMS

ACGIH	American Conference of Governmental Industrial Hygienists
AIHA	American Industrial Hygiene Association
AOC	area of concern
AOI	area of interest
APR	air purifying respirator
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
Contractor	General Contractors (Sevenson Environmental Services, Inc. and ENTACT & Associates, LLC)
CPR	cardiopulmonary resuscitation
CRA	Conestoga-Rovers & Associates, Inc.
Creek Areas	Bailey's Branch Creek, Pleasant Run and its tributaries
CRZ	Contaminant Reduction Zone
dba	decibels (acoustic)
DEET	diethyltoluamide
ENTACT	ENTACT & Associates, LLC
EZ	Exclusion Zone
FM	Factory Mutual Engineering Corporation
GFCI	ground fault circuit interrupters
GM	General Motors Corporation
GMPT	General Motors Powertrain
HASP	Site Health and Safety Plan
HSO	Health and Safety Officer
IDLH	Immediately Dangerous to Life and Health
JSA	Job Safety Analysis
LEL	lower explosive limit
MSD	musculoskeletal disorders
MSDS	Material Safety Data Sheets
MSHA	Mine Safety & Health Administration
NEC	National Electrical Code

LIST OF ACRONYMS

NESC	National Electrical Safety Code
NIOSH	National Institute for Occupational Safety and Health
NOAA	National Oceanic & Atmospheric Administration
NRC	National Response Center
NRR	Noise Reduction Rating
OSHA	Occupational Safety and Health Administration
PCBs	polychlorinated biphenyls
PE	Professional Engineer
PEL	Permissible Exposure Limit
PID	photoionization detector
PPE	Personal Protective Equipment
ppm	parts per million
RA	removal action
REL	Recommended Exposure Limit
RMSF	Rocky Mountain Spotted Fever
SCBA	self-contained breathing apparatus
SERC	State Emergency Response Commission
SES	Sevenson Environmental Services
Site	GMPT Bedford Facility and general vicinity (including Upstream Parcels, Parcel 22, and Downstream Parcels)
SOP	Standard Operating Procedures
SOW	Scope of Work
STAR	Stop, Think, Act, and Review
STEP	Safe Task Evaluation Process
SZ	Support Zone
TLV	Threshold Limit Value
U.S. EPA	United States Environmental Protection Agency
UL	Underwriters Laboratory
USCG	United States Coast Guard
VOC	volatile organic compound

1.0 INTRODUCTION

Conestoga-Rovers & Associates, Inc. (CRA) has prepared this comprehensive Health and Safety Plan (HASP) on behalf of General Motors Corporation (GM). This HASP presented herein describes the health and safety procedures and emergency response guidelines to be implemented during activities within the general vicinity of the GM Powertrain (GMPT) Bedford Facility (Site) located in Bedford, Indiana. This HASP will address the safety and health requirements associated with the various environmental Work Plans prepared by CRA for the Site. Figures depicting the Site Location and the Site Plan are included in this HASP as Figures 1.1 and 1.2, respectively.

A Removal Action (RA) will be implemented on portions of the creek and floodplains associated with Bailey's Branch, Pleasant Run and its tributaries (Creek Areas), in accordance with an Administrative Order by Consent (AOC) under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) between the U.S. Environmental Protection Agency (U.S. EPA) and GM. Additionally, CRA personnel and its subcontractors will implement an investigation and sampling program at the Site.

The scope of work (SOW) to be completed during Site activities includes the following work activities:

- i) mobilization and demobilization of labor, materials, and equipment to and from the Site;
- ii) oversight of construction activities which includes: staging area construction; placement of designated materials within the staging area and subsequent off-Site transportation and disposal of impacted materials; contractor mobilization, demobilization, decontamination, and Site set-up; Site clearing (removal of trees); temporary fencing installation; survey layout of excavation areas; construction of stormwater controls (berms, swales, and culverts); excavation and handling of contaminated materials and backfilling activities; stream monitoring and water management activities; air monitoring/sampling; and Site restoration activities;
- iii) sampling and monitoring activities involving the sampling of soil, water, debris, and sediment. Sampling tasks may involve drilling (investigative) activities;
- iv) perimeter air monitoring at the Site;
- v) test pit excavations, which include subsequent sampling activities;

- vi) Site restoration; and
- vii) decontamination activities.

During a portion of these activities, personnel may come in contact with washwaters, soils, debris, groundwater, and surface water that contain hazardous substances. This HASP has been developed to minimize direct contact by Site personnel with materials potentially having chemical presence by ensuring:

- i) that Site personnel are not adversely exposed to the compounds of concern;
- ii) that public health and the environment are not adversely impacted by materials with elevated chemical presence which may potentially migrate off-Site during work activities at the Site;
- iii) compliance with applicable governmental and non-governmental (American Conference of Governmental Industrial Hygienists [ACGIH]) regulations and guidelines. In particular, the amended rules of the Occupational Safety and Health Administration (OSHA) for Part 1926 (Title 29 Code of Federal Regulations [CFR] Part 1926.65) will be implemented for all Site work; and
- iv) initiation of proper emergency response procedures to minimize the potential for any adverse impact to Site workers, the general public, or the environment.

For the purpose of this HASP, activities performed on-Site involving contact with materials with potentially elevated chemical presence will be considered contaminated operations requiring Personal Protective Equipment (PPE). A detailed description of the PPE required is presented in Section 6.1.

All work activities at the Site will be conducted in accordance with provisions of an approved Site-specific HASP. The applicability of this HASP extends to personnel who will be on Site, including, CRA employees, CRA subcontractors and visitors to the Site. Certain activities at this Site where personnel will not have the potential for contact with contamination and no potential for exposure exists will be exempt from all provisions of the standard (29CFR1926.65 or 29CFR1910.120), including the medical and training requirements.

A vital element of CRA's Health and Safety Policies and Procedures is the implementation of this Site-specific HASP for field activities. This HASP, as applicable to this project, includes the following measures:

- Communicate the contents of this HASP to site personnel.
- Utilize the STAR (Stop, Think, Act, and Review) process before beginning any activity/task/job, after an incident, and/or any unusual circumstances. Stop activities to think about the task, analyze the task hazards and determine methods to reduce risk, and review the results with affected personnel.
- Revise or develop job safety analysis (JSA) table(s) for activities. Supervisors and affected personnel are responsible for JSA development.
- Eliminate unsafe conditions. Efforts must be initiated to identify conditions that can contribute to an accident and to remove exposure to these conditions. Supervisory personnel shall ensure that personnel committing unsafe acts are held accountable via counseling, mentoring and, if necessary, reprimand.
- Reduce unsafe acts. Personnel shall make a conscious effort to work safely. A high degree of safety awareness must be maintained so that safety factors involved in a task become an integral part of the task.
- Inspect frequently. Regular safety inspections of the work site, materials, and equipment by qualified persons ensure early detection of unsafe conditions. Safety and health deficiencies shall be corrected as soon as possible, or project activities shall be suspended. Documentation of daily inspections and corrective actions should be kept with the project files.

Contractors and subcontractors who will be working at the Site will be required to develop a HASP based on their specific SOW. The contractor's HASP must meet the applicable requirements of this HASP, which has been prepared by CRA. A contractor or subcontractor may adopt the provisions contained in this HASP as part of its own HASP, but must still provide a Site-specific HASP and SOW that details their activities and health and safety procedures that will be implemented as part of their activities.

A copy of this HASP and employer specific Standard Operating Procedures (SOP)/Safety Programs will be maintained on Site whenever activities are in progress. Contractor Programs for similar activities must meet or exceed any referenced CRA Programs. A copy of any CRA Health and Safety Programs referenced in this HASP will be available at the Site.

1.1 PROJECT ORGANIZATION

The project will be organized as follows (See Figure 1.3 entitled, Project Team Organization, for additional information):

Remedial Contractor(s)

There is the potential for various contractor(s) to be working on-Site concurrently. The selected contractor(s) will be responsible for providing both a Site Superintendent (competent person) and a Health and Safety Officer (HSO) to direct their activities. These individuals will be responsible for ensuring that all contract specifications are met, including those related to Site health and safety. The names of these individuals will be presented in the HASPs of each contractor. All contractor personnel working at the Site will report to the CRA Project Coordinator through the CRA On-Site Construction Coordinator and, in keeping with OSHA requirements, are required to comply with all procedures referenced in this HASP, the contractor HASP, OSHA regulations, and the GMPT Bedford Facility Safety Operating Procedures.

The remedial contractor(s) is contracted directly to GM and as such is the General Contractor (Contractor) for the RA portion of the project responsible for performing remedial construction activities, which includes the supervision, inspection, and direction of remedial activities. The remedial contractor(s) may employ various subcontractors as necessary to assist with the completion of project activities.

The remedial contractor(s) will employ and keep on-Site at all times a competent resident supervisor (Site Superintendent) and necessary assistants (i.e., foremen, engineers, etc.) to ensure that all project specifications are met including those related to safety and health. Additionally, the contractor(s) will designate a qualified and experienced safety representative (Site Health and Safety Officer) at the Site whose duties and responsibilities will be the prevention of accidents, implementation and enforcement of the Site-specific HASP, and maintaining and supervising Site safety precautions and programs.

Project Coordinator (*Conestoga-Rovers and Associates*)

CRA will act as the overall Project Coordinator for the Site. The CRA Project Coordinator will direct and generally oversee activities on behalf of GM during the implementation of Site activities. Additionally, CRA will provide Engineering

Oversight services for project activities. However, CRA may employ various environmental subcontractors (drilling contractors, specialty consultants, etc.) to assist with Site activities as necessary.

CRA will provide an On-Site Construction Coordinator who will direct the day-to-day activities of CRA personnel and provide engineering oversight for remedial contractor activities. Additional support will be provided by a CRA HSO who will be responsible for ensuring compliance with the Site-specific HASP.

2.0 SITE CHARACTERIZATION AND POTENTIALLY HAZARDOUS COMPOUNDS

Creek Areas

The Creek Areas are located in Bedford and Lawrence County, Indiana. The properties, which make up the Creek Areas include residential, agricultural, vacant land, and industrial uses. The GMPT Bedford Facility is located at 105 GM Drive, in Bedford, Indiana as depicted on Figures 1.1 and 1.2. The GMPT Bedford Facility is located in a commercial and industrial setting.

The GMPT Bedford Facility is an active facility and has been operating as an aluminum foundry since 1942. Current products include transmission cases, engine blocks, and pistons.

Based on previous sampling, the constituent of concern at the Creek Areas is polychlorinated biphenyls (PCBs). PCBs are a series of technical mixtures, consisting of many isomers and compounds that vary from mobile oily liquids to white crystalline solids to hard non-crystalline resins. The variability is based upon the degree of chlorination (and location of chlorine atoms) on the diphenyl rings that act as the skeleton for PCBs. The name Aroclor® 1221, 1233, 1242, 1248, 1254, 1260 etc. corresponds to the percentage that the diphenyl rings have been substituted, i.e., 21%, 33%, 42%, etc.

The most commonly encountered PCBs are chlorodiphenyl (42% chlorine) [Aroclor® 1242] and chloridiphenyl (54% chlorine) [Aroclor® 1254]. These compounds are light, straw-colored liquids with typical chlorinated aromatic odors; 42% chlorodiphenyl is a mobile liquid and 54% chlorodiphenyl is a viscous liquid. Chlorodiphenyl (42% chlorine) boils between 617°F and 691°F and freezes at -2°F. Chlorodiphenyl (54% chlorine) boils between 689°F and 734°F and freezes at 50°F. The synonyms for PCBs are chlorodiphenyls, Aroclors, and Kanechlors. Names further defining PCBs, based upon chlorine substitution are Aroclor® 1221, 1232, 1242, 1248, 1254, 1260, 1262, 1268, 2565, 4465, 5442, 5460 and Kanechlor 300, 400, 500. PCBs are incompatible with strong oxidizers. PCBs are used alone and in combination with chlorinated naphthalenes. They are stable, thermoplastic, and nonflammable, and find chief use in insulation for electric cables and wires, in the production of electric condensers, as additives for extreme pressure lubricants, and as a coating in foundry use. PCBs are one member of a class of chlorinated aromatic organic compounds, which are of increasing concern because of their apparent ubiquitous dispersal, persistence in the environment,

and tendency to accumulate in food chains, with possible adverse effects on animals at the top of food webs, including man. The OSHA Permissible Exposure Limit (PEL) and ACGIH Threshold Limit Value (TLV) are 1 mg/m³ for chlorodiphenyl 42% Cl and 0.5 mg/m³ for 54% Cl. The National Institute for Occupational Safety and Health (NIOSH) Recommended Exposure Limit (REL) for both 42% and 54% are 0.001 mg/m³. The Immediately Dangerous to Life and Health (IDLH) level is 5 mg/m³.

Long term exposure to PCBs at high levels of 1 to 10 mg/m³ may produce a burning feeling in the eyes, nose, and face; dry throat; lung and throat irritation; nausea; dizziness; and chloracne and the aggravation of existing acne. Liver damage and digestive disturbance have been reported in some individuals. OSHA has identified PCBs as a dermal carcinogen. PCBs may impair the function of the immune system. PCBs at high levels have been shown to produce cancer and birth defects in laboratory animals. Whether PCBs produce these effects in humans is not known.

Routes of entry are via inhalation of fume or vapor and percutaneous absorption of liquid, ingestion, eye and skin contact. Harmful effects from short term exposure are as follows:

Inhalation - May produce irritation to nose, throat, and lungs. Levels above 10 mg/m³ are reported to be unbearable. Inhalation may contribute significantly to all symptoms of long term exposure.

Skin - Absorption is moderate. Contributes significantly to all symptoms of long term exposure. Sensitized individuals may develop a rash after 2 days exposure by contact or inhalation.

Eyes - May produce irritation. Levels of 10 mg/m³ are severely irritating.

Ingestion - Absorption in the digestive system contributes significantly to all symptoms of long term exposure. There are no reported deaths of humans due to a single ingestion. However, experiments in animals suggest that ingestion of 6 to 10 fluid ounces would cause death to a healthy 150 pound adult.

Test Pitting Activities

On-Site test pit areas include the former north disposal area (Area of Interest (AOI) 4), the former east sand disposal area [plateau and ravine] (AOI 5), the former sludge

disposal and fire training area (AOI 6), the former north lagoon and Outfall 001 (AOI 7), and the former equipment storage area (AOI 15).

Off-Site test pit areas include Areas 1, 2, and 3 located adjacent to the GMPT Bedford Facility, just north of Breckenridge Road. Area 4 is situated approximately 2 miles to the northwest of the first three areas.

Risks associated with these activities will be minimized by implementing engineering controls, safe work practices, and the proper use of PPE.

Potential constituents of concern and exposure routes and exposure limits associated with test pit operations are included in the following table:

<i>Potential Site Contaminants (Currently Known)</i>	<i>Ionization Potential (eV)</i>	<i>Physical Description and Symptoms of Exposure</i>	<i>Routes of Entry</i>	<i>OSHA - PEL (1) ACGIH - TLV (2) IDLH (3)</i>
Benzene	9.24	Colorless to light-yellow liquid with an aromatic odor. Note: A solid below 42 degrees F. Symptoms: Eye, nose, and skin irritant; headache; nausea; giddiness; fatigue; anorexia; exhaustion; and depression.	Skin Absorption, Ingestion, Inhalation, and Contact	1 ppm (1) 0.5 ppm (2) 500 ppm (3)
Ammonia	10.18	Colorless gas with a pungent suffocating odor. Symptoms: Eye, nose, and throat irritant; breathing difficulty; wheezing; chest pain; pulmonary edema; pink frothy saliva; skin burns; vesiculation; and frostbite.	Inhalation, Ingestion, and Contact	50 ppm (1) 25 ppm (2) 300 ppm (3)

<i>Potential Site Contaminants (Currently Known)</i>	<i>Ionization Potential (eV)</i>	<i>Physical Description and Symptoms of Exposure</i>	<i>Routes of Entry</i>	<i>OSHA - PEL (1) ACGIH - TLV (2) IDLH (3)</i>
Ethyl-benzene	8.76	Colorless liquid with an aromatic odor. Symptoms: Eye, skin, and mucous membrane irritant; headache; dermatitis; narcosis; and coma.	Inhalation, Ingestion, and Contact	100 ppm (1)(2) 800 ppm (3)
Fuel Oil	Not Listed	Mostly found as a clear liquid with a distinct odor. Symptoms: Eye, nose, and throat irritant; burning sensation in chest; headache; nausea; weakness; restlessness; incoordination; confusion; drowsiness; vomiting; diarrhea; dermatitis; and chemical pneumonia.	Inhalation, Ingestion, and Contact	10 ppm
Sodium Hydroxide	Not Applicable	Colorless to white odorless solid (flakes, beads, granular form). Symptoms: Eye, skin, and mucous membrane irritant; pneumonitis; eye and skin burns; and temporary loss of hair.	Inhalation, Ingestion, and Contact	2 mg/m ³ (1) 2 mg/m ³ (2) - Ceiling Limit 10 mg/m ³ (3)
Xylenes	8.44 – 8.56	Colorless liquid with an aromatic odor. Symptoms: Eye, skin, throat, and nose irritant; dizziness; excitement; drowsiness; incoordination; staggering; anorexia; nausea; vomit; abdominal pain; and dermatitis.	Skin Absorption, Inhalation, Ingestion, and Contact	100 ppm (1)(2) 900 ppm (3)

<i>Potential Site Contaminants (Currently Known)</i> Poly-chlorinated Biphenols	<i>Ionization Potential (eV)</i> Not Listed	<i>Physical Description and Symptoms of Exposure</i> See the chemical description provided in Section 2.0 for signs and symptoms of exposure.	<i>Routes of Entry</i> Skin Absorption, Inhalation, Ingestion, and Contact	<i>OSHA - PEL (1) ACGIH - TLV (2) IDLH (3)</i> 0.5 mg/m ³ (1)(2) 5 mg/m ³ (3)
Toluene	8.82	Colorless liquid with a sweet, pungent, benzene-like odor. Symptoms: Eye and nose irritant; fatigue; confusion; euphoria; dizziness; headache; dilated pupils; tearing; nervousness; muscle fatigue; insomnia; parasthesia; and dermatitis.	Skin Absorption, Inhalation, Ingestion, and Contact	200 ppm (1) 50 ppm (2) 500 ppm (3)

As the Site covers an extensive amount of territory, the maximum detected concentrations for PCBs and other chemicals of concern will be determined prior to initiating operations in each specific work area. This will ensure that the most accurate data pertaining to that particular work area is utilized.

3.0 **BASIS FOR DESIGN**

This comprehensive HASP was developed to provide a clear and concise document that combines safety and health information from the various Site HASPs which were developed for each individual Work Plan, HASP Addendums, and safety information provided by the GMPT Bedford Facility.

Regulations set forth by OSHA in Title 29, CFR, Parts 1910 and 1926 (29 CFR 1910 and 1926) form the basis of this HASP. Emphasis is placed on Sections 1926.65 (Hazardous Waste Operations and Emergency Response), 1910 Subpart I (Personal Protective Equipment), and 1910 Subpart Z (Toxic and Hazardous Substances). In addition, current TLVs formulated by the ACGIH, have been considered in the development of the selection of PPE. Some of the specifications within this section are in addition to the OSHA regulations, and reflect the positions of the U.S. EPA, the NIOSH, and the United States Coast Guard (USCG) regarding safe operating procedures at hazardous waste sites.

The health and safety of the public and Site personnel and the protection of the environment will take precedence over cost and schedule considerations for all project work.

4.0 RESPONSIBILITIES AND ADMINISTRATION

The CRA HSO shall be responsible, along with the Construction Coordinator, for all decisions regarding operations and work stoppage due to health and safety considerations. The HSO will have prior experience in working at hazardous waste sites.

The on-Site HSO responsibilities include:

- i) issue confined space entry and hot work permits as required;
- ii) responsible for ensuring that proper utility clearances are observed and that "One Call" utility services and GMPT Bedford Facility Site Contact are properly notified prior to excavating, drilling, etc.;
- iii) supervision and enforcement of safety equipment usage, including the required use of extra equipment if appropriate;
- iv) supervision and inspection of equipment cleaning;
- v) periodically conduct a training needs assessment for CRA Site personnel based on potential tasks/activities and conduct training as necessary to ensure compliance;
- vi) implementation of the CRA Excavation and Trenching Program to meet the requirements set forth in 29 CFR 1926 – Subpart P;
- vii) supervision of decontamination;
- viii) conduct the on-Site personnel safety indoctrination session for potential hazards, personal hygiene principles, confined space entry procedures, all other Programs, safety equipment usage, emergency procedures, location of first aid kits, and identification of personnel trained in first aid and cardiopulmonary resuscitation (CPR);
- ix) maintain Exclusion Zone (EZ) and Contaminant Reduction Zone (CRZ) work areas;
- x) review and modify the HASP in the form of an Addenda as more information becomes available or conditions warrant;
- xi) authority to suspend work activity due to unsafe working conditions;
- xii) coordination of emergency procedures;
- xiii) ensure that air monitoring for CRA personnel and subcontractors is being performed (as necessary based on Site history and concentrations of contaminants);

- xiv) responsible for overseeing the remedial contractor's air monitoring/sampling program to ensure that the program is being conducted as per the contractor's Site-specific HASP;
- xv) ensure that all on-Site personnel have obtained the required medical examination prior to arrival at the Site, have met the OSHA training requirements, and have been fit tested for the respiratory equipment they may use;
- xvi) maintain the on-Site Hazard Communication Program including copies of Material Safety Data Sheets (MSDSs);
- xvii) conduct brief daily safety meetings;
- xviii) administer the overall Site accident prevention program;
- xix) provide instruction to Site personnel regarding operating, procedures, hazards, and safeguards of tools and equipment when necessary to perform their job; and
- xx) ensure that Job Safety Analysis (JSA) tables are completed/updated by work crews and field supervisor(s) prior to beginning work activities.

5.0 WORKER TRAINING AND EDUCATION

Prior to commencing Site activities, a Health and Safety/Site Indoctrination Session will be presented. Attendance is mandatory for all personnel who will be or who are expected to be involved with project activities.

The training program will stress the importance that each attendee understands the basic principles of personnel protection and safety, be able to perform their assigned job tasks in a safe and environmentally responsible manner, and be prepared to respond in an appropriate manner to any emergency which may arise. A brief history of the Site will be included and the various components of the project HASP will be presented, followed by an opportunity to ask questions to ensure that each attendee understands the HASP. Personnel not successful in completing this training program will not be permitted to enter or work in potentially contaminated areas of the Site. Personnel successful in completing this training program shall sign an acknowledgement form, a copy of which is presented in Appendix A. In addition, daily "tailgate" safety meetings will take place each day prior to beginning the day's work. All Site personnel will attend these safety meetings. The safety meetings will be documented with written sign-in sheets containing a list of topics discussed. Appendix B presents the form that will be used for this purpose.

Contractors working at the GMPT Bedford Plant are required to undergo additional safety training. The Safe Job Operating Procedure entitled, Safety and Fire Specifications for Outside Contractors - Procedure # 532-1, is to be reviewed with Site personnel as part of the Site Safety Indoctrination Session. A copy of this document has been attached to the HASP as Appendix C. Supervisory personnel completing this training are to complete and sign the Contractor Safety and Environmental Agreement Form which is included in Appendix C.

This training will be given in addition to the basic training required under OSHA and is not intended to meet the requirements of 29 CFR 1926.65. Prior to working in or entering an EZ environment (as defined in Section 6.0), all personnel will be required to provide documentation to the HSO indicating successful completion of the training requirements of 29 CFR 1926.65.

6.0 PERSONAL PROTECTIVE EQUIPMENT (PPE)

This section of the HASP describes the requirements for PPE and the specific levels of protection required for each work task to be conducted at the Site during project activities. Basic PPE in all Site areas will consist of hard hats, high visibility safety vests, safety glasses with side shields, and safety boots/shoes with steel or composite toes.

6.1 PROTECTION LEVELS

Personnel will wear protective equipment when project activities involve potential exposure to chemicals from vapors, gases, or particulates that may be generated on Site or when direct contact with potentially hazardous substances may occur. Chemical resistant clothing protects the skin from contact with skin-destructive and absorbable chemicals. Respirators protect lungs, the gastrointestinal tract, and if a full-face respirator is worn, the eyes, against airborne toxicants. Respiratory protection levels will be based on the real-time air monitoring results and the action levels that are presented in Section 6.5.

Protection levels are selected based upon the following:

- i) measured concentrations of the Site chemicals and expected concentrations in the ambient atmosphere compared to allowable exposure levels;
- ii) potential for exposure to chemicals in air, splashes of liquids, or other contact due to the nature of work tasks; and
- iii) Site chemical toxicity, route of exposure, and chemical matrix.

The specific protection levels to be employed at the Site for each work task are listed in Table 6.1. All project activities conducted at the Site will require the use of one of the following levels of PPE.

Level B:

- i) supplied air respirator (Mine Safety and Health Administration [MSHA]/NIOSH approved). Respirators may be positive pressure-demand, self-contained breathing apparatus (SCBA) or positive pressure-demand airline respirator (with escape bottle for IDLH or potential for IDLH atmosphere);
- ii) polycoated tyvek® or saranex® coveralls;
- iii) safety-toed work boots and disposable boot covers or rubber boots;

- iv) disposable nitrile inner gloves;
- v) outer nitrile work gloves;
- vi) high visibility safety vest;
- vii) hearing protection as necessary; and
- viii) hard hat.

Level C:

- i) tyvek® coveralls (polycoated tyvek® when handling or working with liquids [e.g., decontamination]);
- ii) safety-toed work boots and disposable boot covers or rubber boots;
- iii) disposable nitrile inner gloves;
- iv) high visibility safety vest;
- v) outer nitrile inner gloves;
- vi) full-face air purifying respirator (APR), equipped with combination cartridges for organic vapors and particulates (P-100);
- vii) safety glasses (if necessary);
- viii) goggles or face shield (if necessary);
- ix) hearing protection as necessary; and
- x) hard hat.

Modified Level D:

- i) tyvek® coveralls (polycoated tyvek® when handling or working with liquids);
- ii) safety-toed work boots and disposable boot covers or rubber boots;
- iii) disposable nitrile inner gloves;
- iv) outer nitrile work gloves (as necessary based on task);
- v) high visibility safety vest;
- vi) safety glasses;
- vii) splash shields as necessary;
- viii) hearing protection as necessary; and
- ix) hard hat.

Level D:

- i) standard work uniform or coveralls;
- ii) safety-toed work boots;
- iii) gloves as necessary;
- iv) safety glasses;
- v) high visibility safety vests;
- vi) splash shield as needed;
- vii) hearing protection as necessary; and
- viii) hard hat.

PPE will be maintained in a clean sanitary condition and ready for use. Disposable coveralls shall be discarded when torn and as an employee leaves the EZ. Hard hats shall be thoroughly cleaned after leaving the EZ. Respirators shall be cleaned after each day's use and cartridges discarded. A sufficient quantity of potable water shall be supplied for washing, cleaning PPE, and drinking. A potable water supply for washing and cleaning PPE will be maintained adjacent to the decontamination area described in Section 9.0. Fresh potable water for drinking will be supplied on a daily basis and be maintained at a location removed from the active work area.

6.2 REASSESSMENT OF PROTECTION LEVELS

Protection levels provided by PPE selection shall be upgraded or downgraded based upon a change in Site conditions or the review of the results of air monitoring.

When a significant change occurs, the hazards shall be reassessed. Some indicators of the need for reassessment are:

- i) commencement of a new work phase;
- ii) change in job tasks during a work phase;
- iii) change of season/weather;
- iv) when temperature extremes or individual medical considerations limit the effectiveness of PPE;
- v) chemicals other than those expected to be encountered are identified;
- vi) change in ambient levels of chemicals; and

- vii) change in work scope that effects the degree of contact with areas of potentially elevated chemical presence.

All proposed changes to protection levels and PPE requirements will be reviewed and approved prior to their implementation by the HSO and Regional Safety and Health Manager.

6.3 DURATION OF WORK TASKS

The duration of project activities involving the usage of PPE will follow ACGIH guidelines and will be established by the HSO or his designee based upon ambient temperature and weather conditions, the capacity of personnel to work in the designated level of PPE (see Section 7.3 – Heat Stress, Section 7.4 – Cold Stress, and Section 12.4 - Temperature), and limitations of the protective equipment (i.e., ensemble permeation rates, life expectancy of air-purifying respirator cartridges, etc.). As a minimum, rest breaks will be observed at the following intervals:

- i) 15 minutes midway between shift startup and lunch;
- ii) 0.5 hour for lunch; and
- iii) 15 minutes in the afternoon, between lunch and shift end.

All rest breaks will be taken in a clean area (e.g., support zone) after full decontamination and PPE removal. Additional rest breaks will be observed based upon the heat and cold stress monitoring guidelines presented in Sections 7.3 and 7.4, and the CRA Health and Safety Programs.

6.4 LIMITATIONS OF PROTECTIVE CLOTHING

PPE ensembles designated for use during project activities have been selected to provide protection against chemicals at known or anticipated concentrations in the soil and groundwater. However, no protective garment, glove, or boot is chemical-proof, nor will it afford protection against all chemical types. Permeation of a given chemical through PPE is a complex process governed by the chemical concentrations, environmental conditions, physical condition of the protection garment, and the resistance of a garment to a specific chemical; chemical permeation may continue even after the source of the chemical has been removed from the garment.

In order to obtain optimum usage from PPE, the following procedures are to be followed by all Site personnel using PPE:

- i) when using disposable coveralls, don a clean, new garment after each rest break or at the beginning of each shift;
- ii) inspect all clothing, gloves, and boots both prior to and during use for:
 - a) imperfect seams,
 - b) non-uniform coatings,
 - c) tears,
 - d) poorly functioning closures; and
- iii) inspect reusable garments, boots, and gloves both prior to and during use for:
 - a) visible signs of chemical permeation,
 - b) swelling,
 - c) discoloration,
 - d) stiffness,
 - e) brittleness,
 - f) cracks,
 - g) any sign of puncture, and
 - h) any sign of abrasion.

Reusable gloves, boots, or coveralls exhibiting any of the characteristics listed above will be discarded. PPE used in areas known or suspected to exhibit elevated concentrations of chemicals will not be reused.

EZ personnel also carry certain responsibilities for their own health and safety, and are required to observe the following safe work practices:

- i) familiarize themselves with this HASP;
- ii) use the "buddy system" when working in a contaminated operation;
- iii) use the safety equipment in accordance with training received, labeling instructions, and common sense;
- iv) maintain safety equipment in good condition and proper working order;

- v) refrain from activities that would create additional hazards (i.e., smoking, eating, etc., in restricted areas, leaning against dirty, contaminated surfaces);
- vi) smoking, eating, and drinking will be prohibited except in designated areas. These designated areas may change during the duration of the project to maintain adequate separation from the active work area(s). Designation of these areas will be the responsibility of the HSO; and
- vii) soiled disposable outerwear shall be removed and placed into a covered container prior to washing hands and face, eating, using lavatory facilities, or leaving the Site.

6.5 RESPIRATORY PROTECTION PROGRAM

All on-Site personnel will be required to comply with their employer specific written respiratory protection program developed in accordance with OSHA 29 CFR 1910.134. CRA personnel will comply with the CRA Respiratory Protection Program.

Respiratory protection may be required during some of the project activities. This is to ensure worker protection from potentially contaminated particulates and volatile organic compounds (VOCs). During intrusive activities, a photoionization detector (PID) will be used to determine the levels of organic vapors present and a particulate monitor will be used to monitor particulate levels in the breathing zone. Background readings will be established prior to commencing work activities at each active work area.

Sustained (greater than five minutes) air monitoring action levels and appropriate respiratory protection when dealing with unknown atmospheres and/or areas that have not been previously characterized for the presence of chemicals of concern (i.e., test pit excavation activities, drilling in new area(s), etc.) are as follows:

<i>Sustained Organic Vapor Reading Above Background Within Worker Breathing Zone in Parts Per Million (ppm)</i>	<i>Action Taken</i>
0 or Background	Full-face air purifying respirator available
>0 – <5	- Upgrade to Level C - Wear full-face air purifying respirator equipped with OV/ Acid Gas/P-100 filter cartridge. - Attempt to identify chemical(s) in air via colorimetric evaluation and/or air sampling. NOTE: If GM or CRA are unable to identify and quantify the contaminants, level B will be required when the PID reading is greater than background (and designated site contaminants are ruled out or air sampling does not provide pertinent data). The contaminant will be unknown and NIOSH, OSHA, and manufacturer's use requirements for air purifying respirators will not be met thus requiring an upgrade to level B. If readings subside then workers can downgrade to level D respiratory protection.
>5	Must wear supplied air respirator - Implement additional engineering controls
> 50	Shut down activities

Dust control measures will be implemented to limit the excessive emission of dust. Therefore, the action level for total dust is as follows:

<i>Sustained Particulate Reading Above Background Within Worker Breathing Zone in Parts Per Million</i>	<i>Action Taken</i>
0 – 0.5 mg/m ³	Full-face air purifying respirator available
0.5 mg/m ³ - 2.5 mg/m ³	Upgrade to Level C - Wear full-face air purifying respirator equipped with OV/ Acid Gas/P-100 filter cartridge
> 2.5 mg/m ³	Shut down Site activities and implement additional engineering controls

All efforts will be made to implement additional engineering controls to minimize the need to wear a supplied air respirator. If the ambient concentrations of organic vapors

are due to identifiable substances, the level of respiratory protection may be altered by the HSO.

The appropriate air purifying respirator cartridge to be used at the Site is a combination organic vapor/acid gas and P-100 particulate cartridge. The cartridge used must be of the same manufacturer as the respiratory face piece.

6.6 SITE CONTROL

A temporary fence and/or caution tape with appropriate warning signs will be installed to prevent unauthorized access to the Site work areas. Visitors may gain access to the other side of the fence only if they are escorted. The intention is to keep them out of the EZ. Designated work areas will be set up as appropriate during the Site field activities, as required. The purpose of these procedures is to limit access to areas with potentially elevated chemical presence, and prevent the migration of potentially hazardous materials into adjacent clean areas. These areas are described in the following:

- i) The Exclusion Zone (EZ) is the area immediately surrounding the active work area. Sufficient area will be provided for efficient movement of personnel and equipment as well as chemical control. Boundaries are modifiable depending on operational requirements. The HSO will be responsible for maintaining the boundaries of this area. Personnel entering this area are required to wear the PPE as defined previously. A wind direction indication device (i.e., flagging, windsock, etc.) will be mounted in the area of any EZ during Site activities.

All personnel (including visitors) entering the EZ or CRZ using respiratory protection must have successfully passed a respirator fit test in accordance with OSHA 29 CFR 1910.134. Documentation of fit testing is the responsibility of each employer.

In the event that unauthorized personnel enter the EZ, work will stop. Work will not resume until the unauthorized personnel have been removed from the EZ or have been moved to an acceptable on-Site area. A log of all visitors to the Site, including those entering the EZ, will be maintained.

- ii) The Contaminant Reduction Zone (CRZ) will provide a location for removal of PPE, which has contacted material with elevated chemical presence, and final removal and decontamination of personnel and equipment. Supplemental safety equipment, such as fire extinguishers, portable eyewash, and extra quantities of

PPE may be stored in this area. The general order in which safety equipment is to be donned is as follows:

- a) Tyvek[®] suit;
 - b) rubber boots;
 - c) gloves;
 - d) safety vest and glasses;
 - d) respirator (if required); and
 - e) hard hat.
- iii) The Support Zone (SZ) is situated in clean areas where there is a minimal risk of encountering hazardous materials or conditions. PPE beyond standard construction safety equipment is therefore not required.

7.0 ACTIVITY HAZARD/RISK ANALYSIS

This section identifies the general hazards associated with specific project activities and presents the documented or potential health and safety hazards that exist at the Site. Every effort will be made to reduce or eliminate these hazards. Those, which cannot be eliminated, must be guarded against by use of engineering controls and/or PPE. Table 7.1 presents the anticipated hazards/risks and hazard controls. Specific activity job safety analysis will be developed to address the hazards associated with site operations outlined in Section 1 of this HASP.

In addition to the chemical hazards presented in Section 2.0 of this HASP, physical hazards at the Site include: uneven terrain; ladders; excavations and test pits; biological hazards; manual material handling; steep slopes; slippery surfaces; potential confined spaces; the use of heavy equipment; working from/on elevated surfaces; the use of decontamination equipment; and potential heat and cold stress. It will be the responsibility of each on-Site contractor and their personnel to identify the physical hazards posed by the various Site project activities and implement preventative and corrective action.

7.1 CHEMICAL EXPOSURE

Preventing exposure to toxic chemicals is a primary concern. Chemical substances can enter the unprotected body by inhalation, skin absorption, ingestion, or through a puncture wound (injection). A contaminant can cause damage at the point of contact or can act systematically, causing a toxic effect at a part of the body distant from the point of initial contact.

Chemical exposures are generally divided into two categories: acute and chronic. Symptoms resulting from acute exposures usually occur during or shortly after exposure to a sufficiently high concentration of a chemical. The concentration required to produce such effects varies widely from chemical to chemical. The term "chronic exposure" generally refers to exposures to "low" concentrations of a contaminant over a long period of time. The "low" concentrations required to produce symptoms of chronic exposure depend upon the chemical, the duration of each exposure, and the number of exposures. For a given chemical, the symptoms of an acute exposure may be completely different from those resulting from chronic exposure.

For either chronic or acute exposure, the toxic effect may be temporary and reversible, or may be permanent (disability or death). Some chemicals may cause obvious symptoms such as burning, coughing, nausea, tearing eyes, or rashes. Other chemicals may cause health damage without any such warning signs (this is a particular concern for chronic exposures to low concentrations). Health effects, such as cancer or respiratory disease, may not become manifest for several years or decades after exposure. In addition, some toxic chemicals may be colorless and/or odorless, may dull the sense of smell, or may not produce any immediate or obvious physiological sensations. Thus, a worker's senses or feelings cannot be relied upon in all cases to warn of potential toxic exposure.

The effects of exposure not only depend on the chemical, its concentration, route of entry, and duration of exposure, but may also be influenced by personal factors such as the individual's smoking habits, alcohol consumption, medication use, nutrition, age, and sex.

An important exposure route of concern at the Site is inhalation. The lungs are extremely vulnerable to chemical agents. Even substances that do not directly affect the lungs may pass through lung tissue into the bloodstream, where they are transported to other vulnerable areas of the body. Some toxic chemicals present in the atmosphere may not be detected by human senses (i.e., they may be colorless, odorless, and their toxic effects may not produce any immediate symptoms). Respiratory protection is therefore extremely important if there is a possibility that the work site atmosphere may contain such hazardous substances. Chemicals also can enter the respiratory tract through punctured eardrums. Where this is a hazard, individuals with punctured eardrums should be medically evaluated specifically to determine if such a condition would place them at an unacceptable risk and preclude their working at the task in question.

Direct contact of the skin and eyes by hazardous substances is another important route of exposure. Some chemicals directly injure the skin. Some pass through the skin into the bloodstream where they are transported to vulnerable organs. Skin absorption is enhanced by abrasions, cuts, heat, and moisture. The eye is particularly vulnerable because airborne chemicals can dissolve in its moist surface and be carried to the rest of the body through the bloodstream (capillaries are very close to the surface of the eye). Wearing protective equipment, not using contact lenses in chemical atmospheres (since they may trap chemicals against the eye surface), keeping hands away from the face, and minimizing contact with liquid and solid chemicals can help protect against skin and eye contact.

Although ingestion should be the least significant route of exposure at the Site, it is important to be aware of how this type of exposure can occur. Deliberate ingestion of chemicals is unlikely; however, personal habits such as chewing gum or tobacco, drinking, eating, smoking cigarettes, and applying cosmetics at the Site may provide a route of entry for chemicals.

The last primary route of chemical exposure is injection, whereby chemicals are introduced into the body through puncture wounds (i.e., by stepping or tripping and falling onto contaminated sharp objects). Wearing safety shoes, avoiding physical hazards, and taking common sense precautions are important protective measures against injection.

7.2 GENERAL PRACTICES

Additional general safety practices to be implemented are as follows:

- i) at least one copy of this HASP and the contractor HASP must be at the project Site, in a location readily available to all personnel, and reviewed by all project personnel prior to starting work;
- ii) all Site personnel must use the buddy system (working in pairs or teams) when performing work within an EZ;
- iii) food, beverages, or tobacco products must not be present or consumed in the EZ and CRZ. Cosmetics must not be applied within these zones;
- iv) emergency equipment such as eyewash, fire extinguishers, etc., must be removed from storage areas and staged in readily accessible locations;
- v) contaminated waste, debris, and clothing must be properly contained and legible and understandable precautionary labels must be affixed to the containers;
- vi) removing contaminated soil from protective clothing or equipment with compressed air, shaking, or any other means that disperses contaminants into the air is prohibited;
- vii) containers must be moved only with the proper equipment, and must be secured to prevent dropping or loss of control during transport; and
- viii) visitors to the Site must be instructed to stay outside the EZ and CRZ and remain within the SZ during the extent of their stay. Visitors must be cautioned to avoid skin contact with surfaces that are contaminated or suspected to be contaminated.

7.2.1 BUDDY SYSTEM

All on-Site personnel must use the buddy system while performing work within the EZ. Visual contact must be maintained between crew members at all times, and crew members must observe each other for signs of chemical exposure, heat, or cold stress. Indications of adverse effects include, but are not limited to:

- i) changes in complexion and skin coloration;
- ii) changes in coordination;
- iii) excessive salivation and pupillary response; and
- iv) changes in speech pattern.

Team members must also be aware of potential exposure to possible safety hazards, unsafe acts, or noncompliance with safety procedures. Employees must inform their partners or fellow team members of non-visible effects of exposure to toxic materials. The symptoms of such exposure may include:

- i) headaches;
- ii) dizziness;
- iii) nausea;
- iv) blurred vision;
- v) cramps; and
- vi) irritation of eyes, skin, or respiratory tract.

If protective equipment or noise levels impair communications, prearranged hand signals must be used for communication. Personnel must stay within line of sight of another team member.

7.3 HEAT STRESS

Heat stress is caused by a number of interacting factors including environmental conditions, clothing, workload, etc., as well as the physical and conditioning characteristics of the individual. Heat stress is one of the most common illnesses associated with heavy outdoor work conducted with direct solar load and, in particular,

wearing PPE can increase the risk of developing heat stress therefore the CRA Heat Stress Program will be routinely covered with Site personnel. Personnel must be aware of the types and causes of heat-related illnesses and be able to recognize the signs and symptoms of these illnesses in both themselves and their co-workers.

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

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

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

Under extreme conditions, such as working for 6 to 8 hours in heavy protective gear, a loss of sodium may occur. Drinking commercially available carbohydrate-electrolyte replacement liquids is effective in minimizing physiological disturbances during recovery.

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

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

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

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

Heat stroke is a medical emergency. The primary signs and symptoms of heat stroke are confusion; irrational behavior; loss of consciousness; convulsions; a lack of sweating (usually); hot, dry skin; and an abnormally high body temperature, e.g., a rectal temperature of 105.8°F (41°C). If body temperature is too high, it causes death. The elevated metabolic temperatures caused by a combination of workload and environmental heat load, both of which contribute to heat stroke, are also highly variable and difficult to predict.

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

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

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

Heat Stress Safety Precautions: Heat stress monitoring and work rest cycle implementation should commence when the ambient adjusted temperature exceeds 72°F (22.2°C). A minimum work rest regimen and procedures for calculating ambient adjusted temperature are described below.

<i>Adjusted Temperature⁽¹⁾</i>	<i>Work-Rest Regimen Normal Work Ensemble⁽²⁾</i>	<i>Work-Rest Regimen Impermeable Ensemble</i>
90°F (32.0°C) or above	After each 45 minutes of work	After each 15 minutes of work
87.5° to 90°F (30.8°C to 32.2°C)	After each 60 minutes of work	After each 30 minutes of work
82.5° to 87.5°F (28.1° to 30.8°C)	After each 90 minutes of work	After each 60 minutes of work
77.5° to 82.5°F (25.3° to 28.1°C)	After each 120 minutes of work	After each 90 minutes of work
72.5° to 77.5°F (22.5° to 25.3°C)	After each 150 minutes of work	After each 120 minutes of work

Notes:

- (1) Calculate the adjusted air temperature (ta adj) by using this equation: $ta\ adj\ ^\circ F = ta\ ^\circ F + (13 \times \text{percent sunshine})$. Measure air temperature (ta) with a standard thermometer, with the bulk shielded from radiant heat. Estimate percent sunshine by judging what percent time the sun is not covered by clouds that are thick enough to produce a shadow (100 percent sunshine = no cloud cover and a sharp, distinct shadow; 0 percent sunshine = no shadows).
- (2) A normal work ensemble consists of cotton coveralls or other cotton clothing with long sleeves and pants.

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

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

- i) Site workers will be encouraged to drink plenty of water and electrolyte replacement fluids throughout the day;
- ii) on-Site drinking water will be kept cool (50 to 60°F) (10 to 15.6°C);

- iii) a work regimen that will provide adequate rest periods for cooling down will be established, as required;
- iv) all personnel will be advised of the dangers and symptoms of heat stroke, heat exhaustion, and heat cramps;
- v) cooling devices such as vortex tubes or cooling vests should be used when personnel must wear impermeable clothing in conditions of extreme heat;
- vi) employees should be instructed to monitor themselves and co-workers for signs of heat stress and to take additional breaks as necessary;
- vii) a shaded rest area must be provided. All breaks should take place in the shaded rest area;
- viii) employees must not be assigned to other tasks during breaks;
- ix) employees must remove impermeable garments during rest periods. This includes Tyvek® garments; and
- x) all employees must be informed of the importance of adequate rest, acclimation, and proper diet in the prevention of heat stress disorders.

Note: Additional information can be referenced in the CRA Health and Safety Program for Heat Stress.

7.4 COLD STRESS

Cold stress is similar to heat stress in that it is caused by a number of interacting factors including environmental conditions, clothing, workload, etc., as well as the physical and conditioning characteristics of the individual. Fatal exposures to cold have been reported in employees failing to escape from low environmental air temperatures or from immersion in low temperature water. Hypothermia, a condition in which the body's deep core temperature falls significantly below 98.6°F (37°C), can be life threatening. A drop in core temperature to 95°F (35°C) or lower must be prevented.

Air temperature is not sufficient to determine the cold hazard of the work environment. The wind-chill must be considered as it contributes to the effective temperature and insulating capabilities of clothing. The equivalent chill temperature should be used when estimating the combined cooling effect of wind and low air temperatures on exposed skin or when determining clothing insulation requirements to maintain the body's core temperature.

The body's physiologic defense against cold includes constriction of the blood vessels, inhibition of the sweat glands to prevent loss of heat via evaporation, glucose production, and involuntary shivering to produce heat by rapid muscle contraction.

The frequency of accidents increases with cold temperature exposures as the body's nerve impulses slow down, individuals react sluggishly and numb extremities make for increased clumsiness. Additional safety hazards include ice, snow blindness, reflections from snow, and possible skin burns from contact with cold metal.

Pain in the extremities may be the first early warning of danger to cold stress. During exposure to cold, maximum severe shivering develops when the body temperature has fallen to 95°F (35°C). This must be taken as a sign of danger to the employees on site, and cold exposures should be immediately terminated for any employee when severe shivering becomes evident. Useful physical or mental work is limited when severe shivering occurs.

7.4.1 PREDISPOSING FACTORS FOR COLD STRESS

There are certain predisposing factors that make an individual more susceptible to cold stress. It is the responsibility of the project team members to inform the HSO to monitor an individual, if necessary, or use other means of preventing/reducing the individual's likelihood of experiencing a cold related illness or disorder.

Predisposing factors that will increase an individual's susceptibility to cold stress are listed below:

- Dehydration: The use of diuretics and/or alcohol, or diarrhea can cause dehydration. Dehydration reduces blood circulation to the extremities.
- Fatigue During Physical Activity: Exhaustion reduces the body's ability to constrict blood vessels. This results in the blood circulation occurring closer to the surface of the skin and the rapid loss of body heat.
- Age: Some older and very young individuals may have an impaired ability to sense cold.
- Alcohol Consumption: Alcohol dilates the blood vessels near the skin surface resulting in excessive body heat loss.

- Sedative Drugs: Sedatives may interfere with the transmission of impulses to the brain, thereby interfering with the body's physiological defense against cold. Some prescription drugs may react the same way.
- Poor Circulation: Vasoconstriction of peripheral vessels reduces blood flow to the skin surface.
- Heavy Work Load: Heavy workloads generate metabolic heat and make an individual perspire even in extremely cold environments. If perspiration is absorbed by the individual's clothing and is in contact with the skin, cooling of the body will occur.
- The Use of PPE: PPE usage that traps sweat inside the PPE may increase an individual's susceptibility to cold stress.
- Lack of Acclimatization: Acclimatization, the gradual introduction of workers into a cold environment, allows the body to physiologically adjust to cold working conditions.
- History of Cold Injury: Previous injury from cold exposures may result in increased cold sensitivity.

7.4.2 PREVENTION OF COLD STRESS

There are a variety of measures that can be implemented to prevent or reduce the likelihood of employees developing cold related ailments and disorders. These include acclimatization, fluid and electrolyte replenishment, eating a well balanced diet, wearing warm clothing, the provision of shelter from the cold, thermal insulation of metal surfaces, adjusting work schedules, and employee education.

- Acclimatization: Acclimatization is the gradual introduction of workers into the cold environment to allow their bodies to physiologically adjust to cold working conditions. However, the physiological changes are usually minor and require repeated uncomfortably cold exposures to induce them.
- Fluid and Electrolyte Replenishment: Cold, dry air can cause employees to lose significant amounts of water through the skin and lungs. Dehydration affects the flow of blood to the extremities and increases the risk of cold injury. Warm, sweet, caffeine-free, non-alcoholic drinks and soup are good sources to replenish body fluids.

- Eating a Well Balanced Diet: Restricted diets including low salt diets can deprive the body of elements needed to withstand cold stress. Eat high-energy foods throughout the day.
- Warm Clothing: It is beneficial to maintain air space between the body and outer layers of clothing in order to retain body heat. However, the insulating effect provided by such air spaces is lost when the skin or clothing is wet.

The parts of the body most important to keep warm are the feet, hands, head, and face. As much as 40 percent of body heat can be lost when the head is exposed.

Recommended cold weather procedures include:

- Inner layers (t-shirts, shorts, socks) should be of a thin, thermal insulating material.
- Wool or thermal trousers. Denim is not a good protective fabric.
- Felt-lined, rubber-bottomed, leather-upper boots with a removable felt insole is preferred. Change socks when wet.
- Wool shirts/sweaters should be worn over inner layer.
- A wool cap is good head protection. Use a liner under a hard hat.
- Mittens are better insulators than gloves.
- Face masks or scarves are good protection against wind.
- Tyvek/poly-coated Tyvek provides good wind protection.
- Wear loose fitting clothing, especially footwear.
- Carry extra clothing in your vehicle.
- Shelters with heaters should be provided for the employees' rest periods if possible. Sitting in a heated vehicle is a viable option. Care should be taken that the exhaust is not blocked and that windows are partially open to provide ventilation.
- At temperatures of 30°F (-1°C) or lower, cover metal tool handles with thermal insulating material if possible.
- Schedule work during the warmest part of the day if possible, rotate personnel and adjust the work/rest schedule to enable employees to recover from the effects of cold stress.

It may not be practically feasible to implement all the above prevention measures. Follow the guidelines given below when the ambient air temperature is below 0°F (-18°C):

- dress warmly;
- replenish fluids and electrolytes at regular intervals;
- provide shelter from the cold; and
- adjust work/rest schedules.

7.4.3 FIRST AID GUIDELINES FOR COLD STRESS

The following describes symptoms of different stages in cold stress and the related first aid treatment guidelines.

FROSTBITE

Stages

Incipient (frost nip)	May be painless. Tips of ears, nose, cheeks, fingers, toes, chin affected. Skin blanched white.
Superficial	Affects skin/tissue just beneath skin; turns purple as it thaws. Skin is firm, waxy; tissue beneath is soft, numb.
Deep	Tissue beneath skin is solid, waxy, white with purplish tinge. Entire tissue depth is affected.

First Aid

Incipient	Warm by applying firm pressure - blow warm breath on spot or submerge in warm water (102°F to 110°F) (39°C to 43°C). Do not rub the area.
Superficial	Provide dry coverage, steady warmth; submerge in warm water.
Deep	Hospital care is needed. Do not thaw frostbitten part if needed to walk on. Do not thaw if there is danger of refreezing. Apply dry clothing over frostbite. Submerge in water; do not rub.

GENERAL HYPOTHERMIA

Stages

- Shivering.
- Indifference.
- Decreased consciousness.
- Unconsciousness.
- Death.

Symptoms

- Muscle tension.
- Uncontrollable shivering.
- Glassy stare.
- Decreased muscle function.
- Speech distortion.
- Blue, puffy skin.
- Slow pulse.
- Shallow breathing.
- Coordination loss.
- Stumbling.
- Forgetfulness.
- Freezing extremities.
- Dilated pupils.
- Fatigue.

Emergency Response

- Keep person dry; replace wet clothing.
- Apply external heat to both sides of patient using available heat sources, including other bodies.
- Give warm liquids - not coffee or alcohol - after shivering stops and if conscious.

- Handle gently.
- Transport to medical facility as soon as possible.
- If more than 30 minutes from a medical facility, warm person with other bodies.

Note: Additional information on cold stress can be found within the CRA Health and Safety Program for Cold Stress.

7.5 EXCAVATION AND TRENCHING

Site activities will involve excavation and trenching of materials. It is the responsibility of the CRA Site HSO and the contractor's Site Supervisor (competent person) to implement the following components of the CRA Excavation and Trenching Program as they relate to project activities:

- i) that all excavations are completed in accordance with an approved contractor's Program;
- ii) that the proper protective materials and equipment are available to complete the excavation and/or trenching procedures;
- iii) complete and document all inspections of the excavation as required before personnel attempt to enter the excavation; and
- iv) submit any contractor's Excavation and Trenching Program to CRA's Safety and Health Group for review prior to initiating excavation activities.

Excavation and trenching operations require pre-planning to determine whether sloping or shoring systems are required, and to develop appropriate designs for such systems. Also, the estimated location of all underground installations must be determined before digging/drilling begins.

If there are any nearby buildings, walls, sidewalks, tress, or roads that may be threatened or undermined by the excavation, where the stability of any of these items may be endangered by the excavation, they must be removed or supported by adequate shoring, bracing, or underpinning.

Excavations may not go below the base of footings, foundations, or retaining walls, unless they are adequately supported or a person who is registered as a Professional Engineer (PE) has determined that they will not be affected by the soil removal. OSHA

recommends using civil engineers or those with licenses in a related discipline and experience in the design and use of slopping and shoring systems. PE qualifications must be documented in writing.

Personnel required to enter or work in the excavation at any time must be protected from the hazards of cave-ins. This requires the use of sloping and/or shoring systems that comply with State and Federal OSHA standards.

An approved contractor's Excavation and Trenching Program will be followed during all excavation activities and provides detailed information regarding such activities.

7.6 SAMPLING AND INSPECTION ACTIVITIES

Activities associated with the sample collection and inspection tasks may include collection of soil, groundwater, surface water, and sediment samples in/at various work areas (excavations, test pits, drilling operations, etc.). Physical hazards associated with sampling/inspection activities may include: severe weather; working from an elevated surface; slips, trips and falls; sharp objects; confined spaces; lifting heavy objects; noise; electrical safety; heat/cold stress; moving or backing vehicles; and use of hand tools.

Sampling activities may involve sampling in excavations. Therefore, CRA's Health and Safety Program for Excavation and Trenching is to be followed. As a minimum, CRA personnel will not enter any excavation until it has been inspected by a competent person and deemed safe for entry. Sampling personnel may request to view the inspection log.

7.7 CONFINED SPACES

A confined space provides the potential for unusually high concentrations of contaminants, explosive atmospheres, oxygen deficient atmospheres, limited visibility, and restricted movement. This section establishes requirements for safe entry into, continued work in, and safe exit from confined spaces. Additional information regarding confined space entry can be found in 29 CFR 1926.21, 29 CFR 1910.146, and NIOSH-106. Entry into a confined space will only be undertaken after remote methods have been tried and found not to be successful. Such work will follow the guidelines presented in the CRA Health and Safety Confined Space Program or an approved

contractor's Confined Space Entry Program. The contractor's Program must minimally meet the requirements set forth in the CRA Confined Space Program.

7.8 FALL HAZARDS

Site personnel may be exposed to fall hazards greater than six feet above another surface with no barriers in place to protect them. These hazards may be found in the following activities: working from elevated surfaces, working from ladders, near excavations, or on equipment, etc.

It is the contractor's responsibility to identify and control all fall hazards posed by the various Site activities. This information will be added to Site-specific HASP and will include procedures to implement preventative and corrective actions. The contractor will provide and document the necessary training on fall protection to affected employees.

7.9 BIOLOGICAL HAZARDS

Biological hazards may include poison ivy, poison oak, snakes, thorny bushes and trees, ticks, mosquitoes, and other pests.

7.9.1 TICK-BORNE DISEASES

Lyme Disease, Erlichiosis, and Rocky Mountain Spotted Fever (RMSF) are diseases transmitted by ticks and occur throughout the United States during spring, summer, and fall.

Lyme Disease: The disease commonly occurs in summer and is transmitted by the bite of infected ticks. "Hot spots" in the United States include New York, New Jersey, Pennsylvania, Massachusetts, Connecticut, Rhode Island, Minnesota, and Wisconsin. Few cases have been identified in other states.

Erlichiosis: The disease also commonly occurs in summer and is transmitted by the bite of infected ticks. "Hot spots" in the United States include New York, Massachusetts, Connecticut, Rhode Island, Minnesota, and Wisconsin. Few cases have been identified in other states.

These diseases are transmitted primarily by the Deer Tick, which is smaller and redder than the common Wood Tick. The disease may be transmitted by immature ticks, which are small and hard to see. The tick may be as small as a period on this page.

Symptoms of Lyme disease include a rash or a peculiar red spot, like a bull's eye, which expands outward in a circular manner. The victim may have headache, weakness, fever, a stiff neck, swelling and pain in the joints, and eventually, arthritis. Symptoms of Erlichiosis include muscle and joint aches, flu-like symptoms, but there is typically no skin rash.

Rocky Mountain Spotted Fever: This disease is transmitted via the bite of an infected tick. The tick must be attached 4 to 6 hours before the disease-causing organism (*Rickettsia rickettsii*) becomes reactivated and can infect humans. The primary symptom of RMSF is the sudden appearance of a moderate-to-high fever. The fever may persist for two to three weeks. The victim may also have a headache, deep muscle pain, and chills. A rash appears on the hands and feet on about the third day and eventually spreads to all parts of the body. For this reason, RMSF may be confused with measles or meningitis. The disease may cause death if untreated, but if identified and treated promptly, death is uncommon.

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

7.9.2 POISONOUS PLANTS

Poison ivy, poison sumac, and poison oak may be present in the work area. Personnel should be alerted to its presence, and instructed on methods to prevent exposure.

Control: The main control is to avoid contact with the plant, cover arms and hands, and frequently wash potentially exposed skin. Particular attention must be given to avoiding skin contact with objects or protective clothing that have touched the plants. Treat every surface that may have touched the plant as contaminated, and practice contamination

avoidance. If skin contact is made, the area should be washed immediately with soap and water, and observed for signs of reddening.

7.9.3 POISONOUS SNAKES

The possibility of encountering snakes (cottonmouths and rattlesnakes) exists, specifically for personnel working in wooded/vegetated areas. Snake venoms are complex and include proteins, some of which have enzymatic activity. The effects produced by venoms include neurotoxic effects with sensory, motor, cardiac, and respiratory difficulties; cytotoxic effects on red blood cells, blood vessels, heart muscle, kidneys, and lungs; defects in coagulation; and effects from local release of substances by enzymatic actions. Other noticeable effects of venomous snake bites include swelling, edema, and pain around the bite, and the development of ecchymosis (the escape of blood into tissues from ruptured blood vessels).

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

In areas where snakes may be encountered, affected personnel are required to wear leather work gloves and snakeproof chaps and/or snakeproof boots. If bitten then personnel are to seek medical attention.

7.10 NOISE

Exposure to noise over the OSHA action level can cause temporary impairment of hearing; prolonged and repeated exposure can cause permanent damage to hearing. The risk and severity of hearing loss increases with the intensity and duration of exposure to noise. In addition to damaging hearing, noise can impair voice communication, thereby increasing the risk of accidents on Site. CRA's Hearing Conservation Program is to be implemented for personnel exposed noise levels above the OSHA action level of 85 decibels (acoustic) (dBA).

Control: All personnel must wear hearing protection with a Noise Reduction Rating (NRR) of at least 20 when noise levels exceed 85 dBA. When it is difficult to hear a co-worker at normal conversation distance, the noise level is approaching or exceeding 85 dBA, and hearing protection is necessary. All Site personnel who may be exposed to noise must also receive baseline and annual audiograms and training as to the causes and prevention of hearing loss.

Whenever possible, equipment that does not generate excessive noise levels will be selected for this project. If the use of noisy equipment is unavoidable, barriers or increased distance will be used to minimize worker exposure to noise, if feasible.

7.11 SANITARY FACILITIES

Site sanitation will be maintained according to OSHA and Department of Health requirements.

7.11.1 BREAK AREA

Breaks must be taken in the SZ, away from the active work area after Site personnel go through decontamination procedures. There will be no eating, drinking, or chewing gum or tobacco in the area other than the SZ. Smoking is not permitted anywhere within the GMPT Bedford Facility.

7.11.2 POTABLE WATER

The following rules apply for all project field operations:

- i) an adequate supply of potable water will be provided at each work Site. Potable water must be kept away from hazardous materials, contaminated clothing, and contaminated equipment;
- ii) portable containers used to dispense drinking water must be capable of being tightly closed, and must be equipped with a tap dispenser. Water must not be drunk directly from the container, nor dipped from the container;
- iii) containers used for drinking water must be clearly marked and not used for any other purpose; and

- iv) disposable cups must be supplied, and both a sanitary container for unused cups and a receptacle for disposing of used cups must be provided.

7.11.3 TRASH COLLECTION

Trash collected from the CRZ will be separated as potentially contaminated waste. Trash collected in the support and break areas will be disposed of as non-hazardous waste. Trash receptacles will be set up in the CRZ and in the SZ.

7.12 ELECTRICAL HAZARDS

Electricity may pose a particular hazard to Site workers due to the use of portable electrical equipment. When electrical work is needed, it must be performed by a qualified electrician in accordance with the CRA Health and Safety Program for Electrical Safety.

General electrical safety requirements include:

- a) all electrical wiring and equipment must be a type listed by Underwriters Laboratory (UL), Factory Mutual Engineering Corporation (FM), or other recognized testing or listing agency;
- ii) all installations must comply with the National Electrical Safety Code (NESC), the National Electrical Code (NEC), or USCG regulations;
- iii) portable and semi-portable tools and equipment must be grounded by a multi-conductor cord having an identified grounding conductor and a multi-contact polarized plug-in receptacle;
- iv) tools protected by an approved system of double insulation, or its equivalent, need not be grounded. Double insulated tools must be distinctly marked and listed by UL or FM;
- v) live parts of wiring or equipment must be guarded to prevent persons or objects from touching them;
- vi) electric wire or flexible cord passing through work areas must be covered or elevated to protect it from damage by foot traffic, vehicles, sharp corners, projections, or pinching;
- vii) all circuits must be protected from overload;

- viii) temporary power lines, switch boxes, receptacle boxes, metal cabinets, and enclosures around equipment must be marked to indicate the maximum operating voltage;
- ix) plugs and receptacles must be kept out of water unless approved for submersible construction;
- x) all extension outlets must be equipped with ground fault circuit interrupters (GFCIs);
- xi) attachment plugs or other connectors must be equipped with a cord grip and be constructed to endure rough treatment;
- xii) extension cords or cables must be inspected prior to each use, and replaced if worn or damaged. Cords and cables must not be fastened with staples, hung from nails, or suspended by bare wire; and
- xiii) flexible cords must be used only in continuous lengths without splice, with the exception of molded or vulcanized splices made by a qualified electrician.

7.13 MANUAL MATERIAL HANDLING HAZARDS

Ergonomics is the science of adapting project activities to the Site personnel that will actually be completing the activity/task. Ergonomics allows personnel to work safely and efficiently by considering the limitations, physical characteristics and other human factors involved during task activities. In this section we will address problems commonly associated with ergonomics, risk factors and preventing these ergonomic problems (commonly referred to as musculoskeletal disorders [MSDs]). An MSD is an injury/disorder of the muscles, tendons, joints, spinal column, and ligaments. (NOTE: This does not include injuries caused by slips, trips and falls. These hazards should be addressed in the Job Safety Analysis.)

7.13.1 BACK DISORDERS

Back disorders are frequently caused by repeated lifting, sudden movements, whole body vibration, lifting and twisting movements, bending over for extended periods, poor physical condition, and bad posture. Lifting heavy and/or awkward objects during a single lift can cause back problems. However, most back problems result from cumulative trauma caused by minor strains accumulating over a period of time. Repetitive movements can irritate and weaken muscle and/or ligaments eventually

causing a more serious injury. Tasks involving the frequent lifting of heavy objects present the highest risks for CRA Site personnel.

7.13.2 OTHER MSD DISORDERS

MSDs from manual lifting in the construction field usually involve the hands, wrists, neck, shoulders, upper/lower back, hips, and knees. The following list presents some of the more common MSDs:

- i) sprains – injury/tear to a ligament;
- ii) strains – injury to muscles;
- iii) degenerative discs – damage to the spine;
- iv) tendinitis – inflammation/soreness of tendons due to repeated movement;
- v) carpal tunnel syndrome;
- vi) thoracic outlet syndrome – hand and wrist nerve disorder; and
- vii) carpet layer's knee – knee pain and sprains.

7.13.3 PREVENTION

Work practice controls for the task should be developed during the safety analysis. Personnel should be instructed on the proper posture for the task in order to alleviate stress and strain to the body.

7.13.3.1 PROPER LIFTING PROCEDURES

Proper lifting techniques can help you lift safely. When you are preparing to lift a load, check the load by testing the weight at one of the corners. Get help or use a device/machine if the load is too heavy. Do not be afraid to ask for help if the load looks too heavy. Do not carry a load you cannot see around or over.

Make sure route of travel is clear of debris and trash. There should be no slip, trip or fall hazards present. Check to make sure that there is enough room/space and that there are no obstructions or overhead hazards.

Always wear proper footwear to protect your feet and to avoid losing your footing. If the object has rough and/or sharp corners and edges wear suitable work gloves. Gloves will assist by providing a good grip (coupling factor) and by protecting the hands.

When attempting the lift, stand close to the load and center yourself over the load. Squat down and get a firm footing and a good grip on the object with feet apart (one foot should be slightly behind the other foot for good balance). As you rise, lift with your legs and keep the load as close to the body as possible. Remember that your legs are stronger than your arms.

When the lift has been made, do not twist or turn the body. If the load must be moved to the left or right, move/change the position of your feet to change direction. Twisting and turning with your back creates out-of-neutral forces that could injure your back. Carry the load as close as possible to your body. Do not carry a load above your head or on your side and never carry a load that is too heavy. Get help or get a machine such as a handcart, forklift, crane, etc.

Set the load down properly by reversing the lifting procedure (i.e., bend at the knees, use your legs instead of your back and arms, do not turn or rotate, etc.) The load should be touching the ground before you release control of it. Always push an object rather than attempting to pull it. Pushing puts less strain on the back.

7.13.3.2 OTHER PREVENTATIVE MEASURES

MSDs can be prevented through proper techniques (i.e., lifting, etc.), proper diet, exercise, and PPE. Examples of proper techniques and planning include obtaining tools include acquiring tools that are ergonomically designed. These include tools that have full hand grips instead of pinch grips, knives and other cutting utensils with ergonomically designed handles, cutting and shearing tools with long handles to increase leverage and power and the distance between the person and the object being cut, and shovels with curved handles to alleviate back strain.

Exercise and the proper diet can assist in the prevention of MSDs by maintaining an overall health body. Personnel should drink 8 glasses of water a day to remain hydrated. This will reduce tearing injuries and prevent stiffness in the muscles, joints and ligaments. A well balanced diet is important to maintain optimal physical and mental function. Caffeine intake should be modified as caffeine increases muscle

sensitivity to pain. Additionally, exercise will strengthen your body and increase the body's flexibility. A strong, flexible body is less apt to become injured.

Back belts are used mostly in general industry but are becoming common in the construction industry as well. Short-term studies indicate that the use of back belts provides a significant reduction in back injuries. Back belts are not considered PPE.

7.13.4 PERSONAL PROTECTIVE EQUIPMENT

The use of PPE will complement the ergonomic solutions and other measures (engineering and administrative controls) implemented by CRA during manual material handling operations. PPE provides a barrier between the worker and the hazard source (sharp edge, hard surface, etc.). Safety shoes, gloves and hard hats are examples of required PPE when handling materials manually. However, for any given situation the proper PPE should be selected so that personnel are properly protected. Over-protection as well as under-protection should be avoided as both instances can be hazardous.

Training involving PPE should include the following: when PPE is necessary; what PPE is necessary; how to wear the required PPE; limitations of PPE; and the proper care/maintenance of PPE.

Hardhats are to be worn to protect against injuries caused by the impact and penetration of falling or flying objects and to prevent unprotected heads from bumping into fixed objects. Eye and face protection will be worn to protect against hazards from flying objects during material handling activities (i.e., cutting metal banding, straps, rope, etc.).

Hand protection is the most important form of PPE when handling materials manually. The Site HSO will select the appropriate hand protection for the task/activity. Gloves are often relied upon to prevent against abrasions, cuts, and burns during material handling activities and many types of gloves actually improve your grip factor. Therefore, it is most important that the most appropriate glove (leather, cotton, kevlar, metal mesh, nitrile, etc.) is selected for the given situation. The following table presents protection factors for commonly used gloves.

<i>Type of Glove</i>	<i>Protection</i>
Rubber	Acids, bases, alcohol – moderate resistance to cuts.
Canvas or cloth	Dirt, wood slivers, sharp edges – some resistance to cuts.
Metal mesh or kevlar	Highly resistant to cuts and scratches and caught between hazards (crushing, etc.)
Insulated	Electrical charges
Cuffed	Protects against liquids trickling into glove and protects the wrist/forearm area from cuts and abrasions.
Leather	Moderate resistance to cuts and abrasions and caught between hazards.

It is important to wash hands frequently when wearing gloves to prevent the build-up of sweat and dirt on the hands. Check gloves regularly for cracks, holes and rips/tears. Keep gloves clean and dry as much as possible.

7.14 DRILLING ACTIVITIES

Drilling operations taking place may include the drilling of boreholes and the installation of monitoring wells. Drilling and sampling activities present several potential hazards. Minimizing these hazards requires strict adherence to safe operating procedures.

Drilling personnel shall adhere to the following practices:

- Equipment should be inspected daily by the operator to ensure that there are no operational problems.
- Before leaving the controls, shift the transmission controlling the rotary drive into neutral and place the feed level in neutral. Before leaving the vicinity of the drill, shut down the drill engine.
- Do not drive the drill rig with the mast in the raised position.
- Before raising the mast, check for overhead obstructions.
- Before the mast of a drill rig is raised, the drill rig must first be leveled and stabilized with leveling jacks and/or cribbing. Re-level the drill rig if it settles after initial set up. Lower the mast only when the leveling jacks are down, and do not raise the leveling jack pads until the mast is lowered completely.

- Employees involved in the operation shall not wear any loose-fitting clothing that has the potential to catch in moving machinery.
- Personnel shall wear safety-toed shoes, safety glasses, hearing protection and hard hats during drilling operations and safety vests during non-intrusive work activities.
- The area shall be roped off, marked or posted, to keep the area clear of pedestrian traffic or spectators.
- All personnel should be instructed in the use of the emergency kill switch on the drill rig. Personnel should routinely verify that the kill switch is functional and documented.
- Any Hot Work activities, including brazing, cutting, torching and/or welding, must have a hot work permit issued prior to beginning operations. Personnel should seek additional information from the HSO prior to commencement of work.

7.15 UTILITY CLEARANCES

Elevated superstructures (e.g., drill rig, backhoe, scaffolding, ladders, cranes) shall remain a minimum distance of 10 feet away from utility lines (<50 kV) and 20 feet away from power lines. Distance from utility lines may be adjusted by the HSO depending on actual voltage of the lines. Contact GMPT Bedford Facility Contact for assistance in determining line voltage, etc.

During all intrusive activities (e.g., drilling, excavating, and probing), the locator line service should be contacted to mark underground lines before any work is started.

Personnel involved in intrusive work shall determine the minimum distance from marked utilities which work can be conducted with the assistance of the locator line service.

7.16 LADDERS

Personnel that will use ladders or have the potential hazard of working on elevated surfaces during project activities shall follow the CRA Program for fall protection. Specific guidelines for ladders are outlined below.

Portable Ladders

Employees who use ladders on worksites must be familiar with safe ladder usage. The pertinent OSHA regulations are found in 29 CFR 1926 – Subpart X Stairways and Ladders.

- Use the 4-to-1 ratio; that is, place the ladder so its feet are 1 foot away from what it leans against for every 4 feet in height to the point where the ladder rests. Example: If the top of a 16-foot ladder leans against a wall, its feet should be placed 4 feet from the wall. The "fireman's method" is a convenient way of checking the angle of the ladder. Place your toes against the base of the ladder; fully extend both arms toward the side rail and parallel to the ground. When standing erect you should be able to hold the ladder's side rails.
- Do not use a ladder in a horizontal position as a runway or a scaffold.
- Do not place a ladder in front of a door that opens toward it unless the door is locked, blocked, or guarded by someone.
- Place a portable ladder so that both side rails have a secure footing. Provide solid footing on soft ground to prevent the ladder from sinking.
- Place the ladder's feet on a substantial and level base, not on a movable object.
- On uneven surfaces, use a block, wedge, or ladder foot.
- On wet or oily pavement, a smooth floor, or an icy or metal surface, the ladder footing must be lashed, blocked, or otherwise secured.
- Do not lean a ladder against unsafe backing, such as loose boxes or barrels.
- When using a ladder for access to high places securely lash or otherwise fasten the ladder to prevent its slipping.
- To gain access to a roof or elevated platform, extend the ladder at least 3 rungs (3 feet) above the point of support.

Ascending or Descending of Ladders

- Maintain three points of contact at all times when going up or down. If material must be handled, raise or lower it with a rope.
- Always face the ladder when ascending or descending.
- Maintain clean, dry footwear as much as possible to prevent slipping on the rungs.

7.17 FLAMMABLE AND COMBUSTIBLE LIQUIDS

The storage, dispensing, and handling of flammable and combustible liquids must be in accordance with OSHA 29 CFR 1910.106. The specific flammable or combustible liquids used at the site may include gasoline, diesel, kerosene, oils, and solvents.

Flammable and combustible liquids are classified according to flash point. This is the temperature at which the liquid gives off sufficient vapors to readily ignite. Flammable liquids have flash points below 100°F. Combustible liquids have flash points above 100°F and below 200°F.

Flammable Liquid Classes

Flammable liquids are known as Class I liquids, and divided into three classes:

- **Class 1A**, liquids having a flash point below 73°F (22.8°C), and having a boiling point below 100°F (37.8°C) (ethyl ether, isoprene, pentane, petroleum ether).
- **Class 1B**, liquids having a flash point below 73°F (22.8°C), and a boiling point at or above 100°F (37.8°C) (acetone, benzene, denatured alcohol, gasoline, methyl ethyl ketone, octane).
- **Class 1C**, liquids having a flash point at or above 73°F (22.8°C) and below 100°F (37.8°C) (amyl acetate, turpentine).

Combustible Liquid Classes

Combustible liquids are known as Class II and III liquids, and divided into three classes:

- **Class II**, liquids include those with a flash point at or above 100°F (37.8°C), and below 140°F (60°C) (diesel, fuel oils, kerosene, mineral spirits).
- **Class III**, liquids are those with a flash point above 140°F. Class III liquids are further divided into two subclasses:
- **Class IIIA**, liquids with a flash point above 140°F and below 200°F (93.3°C).
- **Class IIIB**, liquids with a flash point at or above 200°F (93.3°C).

Note: When a combustible liquid is heated for use to within 30°F (16.7°C) of its flash point, it must be handled in accordance with the requirements for the next lower class of liquids.

Storage

Many flammables can ignite at temperatures at or below room temperature. They are far more dangerous than combustibles when they are heated. As a result, these products must be handled very carefully. At normal temperatures, these liquids can release vapors that are explosive and hazardous to employee health. Exposure to heat can cause some of these liquids to break down into acids, corrosives, or toxic gases.

For this reason, flammable/combustible liquids should be stored in cool, well ventilated areas away from any source of ignition. Always consult the MSDS of the product for specific information.

Flammable and combustible liquids must be stored in designated areas. Such areas must be isolated from equipment and work activity, which may produce flames, sparks, heat or any form of ignition, including smoking. The most practical method is the use of one or more approved (commercially available) flammable/combustible liquid storage cabinets. Each cabinet may store up to the following quantities:

- a) 60 gallons of Class I or II liquids.
- b) 120 gallons of Class III liquids.

Cabinets must be labeled "Flammable – Keep Fire Away". Doors must be kept closed and labeled accordingly. Containers must be kept in the cabinet when not in use.

There are also restrictions on the maximum allowable container size depending on the class of the products. See table below.

Maximum Size of Containers and Portable Tanks

<i>Container Type</i>	<i>Flammable Liquids</i>			<i>Combustible Liquids</i>	
	<i>Class 1A</i>	<i>Class 1B</i>	<i>Class 1C</i>	<i>Class II</i>	<i>Class III</i>
Glass or approved plastic	1 pt	1 qt	1 gal	1 gal	1 gal
Metal (other than DOT drums)	1 gal	5 gal	5 gal	5 gal	5 gal
Safety cans	2 gal	5 gal	5 gal	5 gal	5 gal
Metal drums (DOT spec)	60 gal	60 gal	60 gal	60 gal	60 gal

Approved portable tanks	660 gal	660 gal	660 gal	660 gal	660 gal
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General Requirements

- Keep containers of flammable/combustible liquids closed when not in use.
- Keep flammable/combustible liquids in designated areas and approved cabinets.
- Do not allow use of unapproved containers for transfer or storage. Use only approved safety cans (5-gallon maximum) with a spring closing lid and spout cover, designated to safely relieve internal pressure when exposed to heat or fire.
- Use only approved self-closing spigots, faucets, and manual pumps when drawing flammable/combustible liquids from larger containers/barrels.
- Use only approved metal waste cans with lids for disposal of shop towels/oily rags.
- Designate "Smoking" and "No Smoking" areas.
- Observe all signs indicating "No Smoking," "No Flames," "No Ignition."

Transferring Flammable/Combustible Liquids

- This seemingly routine task can be hazardous if certain precautions are not followed. Grounding and bonding must be observed at all times to prevent the accumulation of static electricity when transferring containers/barrels one to another:
 - Drums should be grounded (#4 copper conductor) to a grounding rod.
 - Bonding is necessary between conductive containers; (e.g., a barrel and a 5-gallon container).

7.18 ALL-TERRAIN AND UTILITY TASK VEHICLES (UTV) OPERATIONS

This procedure provides minimum requirements for the safe work practices during the operation of all-terrain vehicles and utility task vehicles (UTV) (i.e., Kawasaki Mule, Yamaha Rhino, John Deere Gator, etc.) as these vehicles are specifically designed for off-road use only. These vehicles operate and maneuver differently than a passenger vehicle (i.e., cars, trucks, etc.) when driving on uneven terrain and or in muddy, rocky and heavily vegetated areas. Personnel having to use such vehicles will be required to be properly instructed and trained on the units prior to operation. Personnel will be

familiar with the operations and maintenance of the units accordingly to the manufactures "owners" manual.

Prior to operating these vehicles, authorized personnel will complete a "daily" pre-departure inspection (Appendix E). Remove all debris (i.e., mud, weeds, etc.) from moving components and perform housekeeping in and around the cab area. Each vehicle shall be equipped with a minimum of a 2.5lb ABC rated fire extinguisher and a high visibility orange flag extended at a minimum of 3 feet above the top of the roll cage.

All authorized personnel shall operate such vehicles in a safe and responsible manner accordingly to the owner's manual. Excessive speeding or horseplay will not be tolerated when operating these vehicles. Based on certain models and types of vehicles, seat belts are provided and must be worn by the operator and passenger at all times. These types of vehicles (model) are susceptible to tipping/rolling over when operations are being conducted on steep inclines. Avoid operating across bodies of water (i.e., rivers, creeks, etc.) until depth of water has been verified and confirmed by the operator.

Transporting of material/supplies when using utility task vehicles should be loaded uniformly for weight distribution and secured tightly. Refer to the owner's manual for maximum load restrictions.

8.0 AIR MONITORING

This section of the HASP presents the requirements for conducting air monitoring at the Site. The air monitoring program is designed to ensure protection for both personnel working on Site and the surrounding community. The on-Site monitoring program will be conducted by the HSO and will consist of monitoring Site personnel exposures to VOCs, inorganic compounds of concern, oxygen and combustible gas levels, hydrogen sulfide and carbon monoxide. This monitoring will be completed with the use of real-time reading instruments.

Identification of volatile organic vapor or particulate levels in excess of the action levels cited in Section 6.5 shall be reported to the HSO who, in conjunction with the Regional Safety and Health Manager, will determine when PPE should be upgraded or operations be shut down and restarted.

If work is stopped because action levels have been exceeded, air monitoring will continue from a safe distance to determine if there is a threat to the surrounding community.

On-Site Air Monitoring

The HSO or Environmental Monitoring Technician will perform air monitoring to evaluate the exposure of Site personnel to chemical and physical hazards, verify the effectiveness of engineering controls, and determine the proper level of PPE. Air quality will be monitored at the initiation of each intrusive work activity and periodically thereafter. Background measurements immediately upwind of the EZ will be taken before activities commence.

During the progress of excavation activities, the HSO will monitor the levels of VOCs, oxygen and combustible gases, and particulate levels on an hourly basis or more frequently as necessary. The following monitoring equipment will be used for this purpose:

- i) a PID equipped with a 10.6 eV lamp;
- ii) a multigas personal alarm meter (e.g., MSA Passport® Five Star Personal Alarm or equivalent); and
- iii) personal aerosol monitor (e.g., MIE® Personal DataRam or equivalent).

All instruments will be calibrated on a daily basis in accordance with the manufacturer's guidelines. Records of all calibrations and real-time measurements will be kept in a bound field log book.

Real-Time VOC Monitoring

The HSO will monitor for the presence of VOCs based on Site characteristics, historical data, work being conducted in a previously uncharacterized area, etc. PID readings will be taken in and around the exclusion zone. Action levels for upgrading or downgrading of PPE have been established by the U.S. EPA for atmospheres containing unknown concentrations of VOCs.

Combustible Gas, Oxygen, Hydrogen Sulfide, and Carbon Monoxide

Air monitoring for combustible gases and oxygen will be conducted during excavation entry activities, test pitting activities and during other activities where oxygen deficient and/or flammable atmospheres may be encountered (e.g. confined spaces; entry into excavations). The point of excavation and the immediate work area around these activities must be monitored to ensure that an adequate level of oxygen is present, and to determine if a flammable atmosphere exists. Combustible gas and oxygen level monitoring will be conducted as needed in areas that are suspect. The HSO will determine the monitoring frequency based on the observed Site conditions. All work activity must stop where monitoring indicates the flammable vapors concentration is 10 percent of the lower explosive limit (LEL) at a location with a potential ignition source. Such an area must be ventilated to reduce the concentration to an acceptable level.

Action levels for oxygen and LEL are provided below:

- If oxygen concentrations <19.5 percent are obtained in any personnel work area, supplied air respiratory protection will be required and the area will be ventilated.
- If any oxygen concentrations >22.5 percent are obtained in any work area, retreat to a safe atmosphere. Consult the Regional Safety and Health Manager and Project Management for guidance.

Based upon the scope of work involved, oxygen enriched atmospheres are not anticipated. However, it is necessary to be apprised of such readings as they impact LEL readings and vice versa.

LEL Meter Reading: If any readings ≥ 10 percent LEL are obtained:	Action Taken: Stop all activities in the area to those that will not generate sparks; wear non-sparking gear and use non-sparking tools.
If any readings ≥ 20 percent LEL are obtained:	Cease all activities and retreat to a safe atmosphere. Consult the Regional Safety and Health Manager and Project Management.

In addition to combustible gas and oxygen, monitoring for hydrogen sulfide and carbon monoxide will be conducted during confined space entry activities, including excavation entry and test pitting activities.

Carbon Monoxide Reading: If any readings ≥ 20 ppm are obtained:	Action Taken: Cease work immediately and contact the Site HSO and confer with the CRA Regional Safety and Health Manager.
Hydrogen Sulfide Meter Reading: If any readings ≥ 10 ppm are obtained:	Action Taken: Cease all activities in the area and wait for direction from Site HSO and confer with the CRA Regional Safety and Health Manager.

Air Sampling Program

Selected remedial contractors will be responsible for developing and implementing a personal air-monitoring program for its workers. This program will be included in the contractor's Site-specific HASP.

9.0 DECONTAMINATION PROCEDURES

In general, everything that enters the EZ at the Site must either be decontaminated or properly discarded upon exit from the EZ. All personnel, including any State and local officials, must enter and exit the EZ through the decontamination area. Prior to demobilization, potentially contaminated equipment will be decontaminated and inspected by the HSO before it is moved into the clean zone. Materials generated during decontamination will be containerized for off-Site disposal.

The type of decontamination solution to be used is dependent on the type of chemical hazards. The decontamination solution for this Site is Liquinox (soap) for equipment and for any reusable PPE. A MSDS for Liquinox and all other chemical containing products will be maintained on-Site by the HSO.

9.1 EQUIPMENT DECONTAMINATION PROCEDURES

A temporary Equipment Decontamination Pad will be constructed and operational before any work begins involving contact with potentially contaminated material. All equipment must be decontaminated within the CRZ or on the decontamination pad by a high-pressure washer upon exit from the EZ. All waste transport vehicles must be inspected and clean prior to leaving the Site. Decontamination procedures should include: knocking soil/mud from machines; water rinsing using a solution of water and Liquinox; scraping and brushing with long-handled brushes to remove remaining soils and a final water rinse. Particular attention should be paid to tire treads, equipment tracks, springs, joints, sprockets, and under carriages. Equipment will be allowed to air dry in a clean zone before being moved from the Site or traveling onto clean areas. Personnel shall wear Level C or Modified D protection when decontaminating equipment. Modified D protection may be used if authorized by the HSO. Runoff and sediments will be collected and stored until appropriate disposal arrangements are made. Appropriate measures (i.e., wind shields) will be taken to minimize the drift of mist and spray during decontamination. Following decontamination and prior to equipment removal from the Site or travel on clean areas, each piece of equipment will be inspected by the CRA On-Site Construction Coordinator and/or the HSO to ensure that the equipment has been properly cleaned. This inspection shall be included in the Site logbook.

In general, equipment decontamination pads should be installed and operated under the following guidelines:

- i) Sized for the width and weight of the heaviest equipment expected, leaving sufficient room for decontamination equipment, personnel, and waste fluid storage drums.
- ii) Provide an impermeable barrier capable of containing all decontaminated liquids.
- iii) Durably constructed to withstand the wear and tear of equipment tires/tracks.
- iv) Provided with a low point sump where all decontaminated fluids can be collected and pumped out.
- v) Be constructed such that a minimum amount of materials will require special disposal when the decontamination pad is decommissioned. The use of granular fills or stone as the primary load-bearing surface should be avoided.
- vi) The length of the decontamination pad need not be sufficient to contain the entire vehicle. The vehicle can be decontaminated in sections as it passes over the pad.
- vii) If possible, vehicle access into the work zone should be made around the decontamination pad rather than over it. This will reduce the wear and tear on the pad. If such access is made possible, the pad should remain blocked whenever it is not in use.

An equipment decontamination inspection record will be maintained onsite, which includes:

- equipment descriptions with identification numbers or license plates;
- time and date entering decontamination facility;
- time and date exiting the decontamination facility; and
- name of inspector(s) with comment stating that decontamination was performed and completed.

9.2 PERSONNEL DECONTAMINATION PROCEDURES

Personnel decontamination will be completed in accordance with the CRA Health and Safety Program for personnel decontamination. Washwater and sediments will be collected and stored with any runoff water collected for subsequent treatment/disposal. PPE, trash, etc. will be sent off-Site for disposal. It will be kept separate from trash generated in clean areas of the Site. A description of the proper procedures for doffing PPE as well as personnel decontamination procedures are prescribed in detail in the

CRA Health and Safety Programs. However, the general guidelines for a typical Level C decontamination line are described below:

- i) upon entering the CRZ, rinse contaminated materials from boots or remove contaminated boot covers;
- ii) clean reusable protective equipment;
- iii) remove protective garments, equipment, and respirator. All disposable clothing should be placed in a covered container which is labeled;
- iv) wash hands, face, and neck or shower (if necessary);
- v) proceed to clean area and dress in clean clothing; and
- vi) clean and disinfect respirator for next use.

10.0 GENERAL SAFETY AND PERSONAL HYGIENE

1. Eating at the Site is prohibited except in specifically designated areas. Designation of eating areas will be the responsibility of the HSO. The location of these areas may change during the duration of the project to maintain adequate separation from the active work area(s).
2. Smoking at the Site is prohibited except in specifically designated areas.
3. Individuals getting wet to the skin with effluent from the washing operation must wash the affected area immediately. If clothes in contact with skin are wet, then these must be changed.
4. Hands must be washed with soap and water before eating, drinking, smoking, and before using toilets.
5. All disposable coveralls and soiled gloves will be placed in covered containers at the end of every shift or sooner, if deemed necessary by the HSO. Wastes will be stored until proper disposal arrangements have been made.
6. Personnel working on Site will not be permitted to wear facial hair that interferes with the mask-to-face seal on air-purifying respirators.

11.0 MEDICAL SURVEILLANCE

In accordance with the requirements detailed in 29 CFR 1926.65, 29 CFR 1926.62, and 29 CFR 1910.134, all Site personnel who will come in contact with materials with potentially elevated chemical presence will have received medical surveillance by a licensed physician or physician's group as per a medical surveillance program complying with 29 CFR 1926.65.

Medical records for all on-Site personnel will be maintained by their respective employers. The medical records will detail the tests that were taken and will include a copy of the consulting physician's statement regarding the tests and the employee's suitability for work.

The medical records will be available to the employee or his/her designated representative upon written request, as outlined in 29 CFR 1910.1020.

Each employer will provide certifications to the HSO that its personnel involved in Site activities will have all necessary medical examinations and will have obtained medical certification prior to commencing work, which requires respiratory protection or potential exposure to hazardous materials. Personnel not obtaining medical certification will not perform work within the CRZ and EZ.

Interim medical surveillance will be completed if an individual exhibits poor health or high stress responses due to any Site activity or when accidental exposure to elevated concentrations of chemicals occur.

12.0 ENVIRONMENTAL CONTROL PROGRAM

This section of the HASP outlines measures to be implemented at the Site to prevent hazards associated with environmental conditions.

12.1 WEATHER MONITORING

The HSO or Site Superintendent will be responsible for checking weather forecasts for the next day and week of work to provide advance notification of any severe weather conditions. Severe weather conditions (e.g., heavy rains) may cause unsafe conditions at the site and in some situations work may have to be stopped.

12.2 TORNADO SAFETY POLICY AND PROCEDURES

Tornadoes occur most frequently between April and October from 3:00 to 7:00 P.M. but can occur any time. In most cases, tornadoes move from a west/southwest direction. A typical tornado is a swirling storm of short duration with winds up to 300 miles per hour and a near vacuum at its center. It appears as a rotating funnel-shaped cloud, from gray to black in color, extending towards the ground from the base of a thundercloud.

Tornadoes usually only cover a limited geographical area and give off a roaring sound. A tornado is the most concentrated and destructive potential weather event at the Site. Tornadoes are usually the result of the interaction of a warm, moist air mass with a cool or cold air mass. Secondary effects of tornadoes include flash flooding, electric power outages, transportation-system and communication-system disruption, and fires.

Whenever weather conditions develop that indicate tornadoes are expected, the National Weather Service will issue a tornado watch to alert people in a designated area for a specific time period (normally six hours) to remain alert for approaching storms. The tornado watch is upgraded to a tornado warning when a funnel cloud (tornado) is actually sighted or indicated by weather radar.

When a tornado is approaching Site personnel will only have a short time to react. Therefore Site personnel must be prepared to react during periods of severe weather. Memorize the following tornado danger signs:

- i) approaching clouds of debris can mark the location of a tornado even if a funnel cloud is not visible;
- ii) before a tornado hits, the wind may die down and the air can become very still/calm; and
- iii) it is not uncommon to see clear, sunlit skies behind a tornado as they usually occur at/near the trailing edge of thunderstorms.

Tornado Evacuation Procedures (Tasks being conducted in close proximity of GMPT Bedford Facility and Downstream Creek Areas)

Plant Security continuously monitors weather related information provided by Weather Data Service. If Weather Data Service issues a tornado warning (an actual funnel cloud is heading in the direction of the GMPT Bedford Facility), Plant Security will activate the GMPT Bedford Facility emergency response plan. CRA will be notified verbally via the GMPT Bedford Facility two-way radio system by Plant Security. Note: Plant Security tornado notification will override all other radio transmissions.

The "take shelter" warning signal is a "slow wail" of the alarm system. This alarm will not be audible to all CRA personnel that are working near the plant. Therefore, all Site personnel will evacuate the work zone(s) when a tornado watch has been issued by the National Weather Service. Personnel will be contacted by cellular telephones or contractor-supplied two-way radios. Check remote areas of the work zone(s) to ensure all personnel have reacted to the alert. Personnel must proceed to the Site mustering point and wait for further instructions. If a tornado watch is upgraded to a tornado warning, all personnel will proceed to the designated tornado shelters. Once inside the shelter, proceed to the basement and conduct a head count to ensure that all personnel are accounted for. In general, stay away from all windows and doors that lead to the outside. Remain in the shelter until the "all clear" signal is given by Plant Security. The "all clear" signal is a steady horn.

The tornado shelter most accessible to CRA personnel, and personnel occupying the adjacent trailers at GM Drive and 4th Street, is located at the wastewater treatment plant on the west side of GM Drive. The shelter has a designated "Tornado Shelter" sign visible on the exterior east wall facing GM Drive. The entrance is located on the northwest side of the building.

The tornado shelter in close proximity to the downstream Creek Area activities (Peerless Road and Bud Ikerd Road) is located at the DIVE Christian Church on Peerless Road. The entrance to the basement is located on the west side of the church.

Personnel that occupy the trailer at GM Drive and Breckenridge Road will be directed to use the main security guard house at the north end of the GM plant building as their tornado shelter.

Directions to the shelter are to be communicated to Site personnel during initial Site safety orientation and throughout the tornado season during subsequent safety meetings. See Figure 12.1 for shelter locations.

If unable to reach the designated shelter, refer to the emergency procedures listed in the next section for personnel working in remote areas. The best protection in a tornado is usually an underground area. If an underground area is not available, consider small interior rooms on the lowest floor without windows, hallways on the lowest floor away from doors and windows, rooms constructed with reinforced concrete/brick/block with a heavy concrete floor and roof, and protected areas away from doors and windows.

Tornado Evacuation Procedures
(Tasks being conducted in areas further from the GMPT Bedford Facility)

Personnel working in remote areas away from the GMPT Bedford Facility will need to implement additional safety and emergency response procedures. As personnel have the potential to work in areas away from the main trailer complex/GMPT Bedford Facility without adequate protective structures (creek/stream and floodplain areas) they will depend on having adequate warning of approaching tornadoes. Field personnel will utilize the following procedures when severe weather threatens:

- i) monitor weather broadcasts via hand-held battery operated National Oceanic and Atmospheric Administration (NOAA) weather radios;
- ii) communicate with base station at CRA trailer complex via hand-held two-way radios and/or cellular telephones in order to have current weather data from GM Plant Security, etc.;
- iii) stay alert for tornado warning signs and evacuate to the trailer complex during thunderstorms; and
- iv) be aware of the potential for flooding (do not drive through areas with high ponding water).

If outdoors during a tornado, personnel should attempt to get inside a safe building. However if shelter is unavailable or there is no time to get indoors, personnel should lie in a ditch or low-lying crouch near a strong building/structure or rock formation (try to stay on the east side). Use arms to protect the neck and head. If traveling in a car/truck, never try to out drive a tornado as tornadoes can change direction and lift a car or truck into the air. Get out of the car immediately and seek shelter.

12.3 RAIN AND SNOW

Excessive amounts of precipitation may cause potential safety hazards for all work tasks. The hazards that would be most commonly associated are slipping, tripping, or falling due to slippery surfaces. Further hazards are detailed by work task (Table 7.1).

Severe weather conditions will result in work stoppage and the implementation of further emergency measures, as described in the CRA Health and Safety Program.

12.4 TEMPERATURE

Site activities are expected to be conducted year-round. Temperature extremes may be experienced which require measures to be implemented to prevent health and safety hazards from occurring. Potential hazards arising from temperature extremes are heat stress and cold exposure.

12.5 WIND

High winds may be encountered at the Site and these can cause hazards that may affect Site personnel health and safety. Preventative measures that will be implemented if necessary are as follows:

- i) restricted Site activity;
- ii) battening down light equipment or building materials;
- iii) partially enclosing work areas; and
- iv) reduction or stoppage of work activities.

12.6 LIGHTNING

Every thunderstorm produces lightning. Lightning is an electrical discharge caused when static electricity builds up between thunderclouds, or thunderclouds and the ground. Lightning strokes carry up to 100 million volts of electricity and leap from cloud to cloud, or cloud to ground and vice versa. Lightning tends to strike higher ground and prominent objects, especially good conductors of electricity such as metal.

Thunder is the noise caused by the explosive expansion of air due to the heat generated by a lightning discharge. Thunder may have a sharp cracking sound when lightning is close by, compared with the rumbling noise produced by more distant strokes.

Because light travels at a faster speed than sound, you can see a lightning bolt before the sound of thunder reaches you.

To judge how close lightning is, count the seconds between the flash and the thunder clap. Each second represents about 328 yards/300 metres. If you can count less than 30 seconds between the lightning strike and the thunder, the storm is less than 6.2 miles/10 km away and there is an 80 percent chance the next strike will happen within that 6.2 miles/10 kms. If you count less than 30 seconds, take shelter, preferably in a house, an all-metal automobile (not a convertible top), or a low-lying area.

Lightning may strike several miles/kilometres away from the parent cloud and precautions should be taken even if the thunderstorm is not directly overhead.

If you hear thunder or see lightning, stop work immediately and seek safe shelter

Remain sheltered for 30 minutes after hearing the last thunder before returning to work.

12.7 OUTDOOR PRECAUTIONS

- **Keep a safe distance** from tall objects, such as trees, hilltops, and telephone poles.
- **Avoid projecting above the surrounding landscape.** Seek shelter in low-lying areas such as valleys, ditches, and depressions, but also be aware of flooding.
- **Stay away from water.** Don't go boating or swimming if a storm threatens. Move to land as quickly as possible if you are on the water. Lightning can strike the water and travel some distance from its point of contact. Don't stand in puddles even if you are wearing rubber boots.

- **Stay away from objects that conduct electricity**, such as tractors, golf carts, golf clubs, metal fences, motorcycles, lawnmowers, and bicycles.
- **Avoid being the highest point in an open area.** Holding a conductive tool, swinging a golf club, or holding an umbrella or fishing rod can make you the tallest object and a target for lightning. Take off shoes with metal cleats.
- **You are safe inside a car during lightning**, but don't park near or under trees or other tall objects, which may topple over during a storm. Be aware of downed power lines, which may be touching your car. You are safe inside the car, but you may receive a shock if you step outside.
- **In a forest**, seek shelter in a low-lying area under a thick growth of small trees or bushes.
- **Be alert for flash floods**, which are sometimes caused by heavy rainfall, if seeking shelter in a ditch or low-lying area.
- **If caught in a level field far from shelter** and you feel your hair stand on end, lightning may be about to hit you. Kneel on the ground immediately, with feet together, place your hands on your knees and bend forward. Don't lie flat.
- **If you are in a group in the open**, spread out, keeping people several yards/metres apart.

12.8 INDOOR PRECAUTIONS

- **Before the storm hits**, disconnect electrical appliances including radios and television sets. Do not touch them during the storm.
- **Don't go outside unless absolutely necessary.**
- **Stay away from doors, windows, fireplaces**, and anything that will conduct electricity, such as radiators, stoves, sinks, and metal pipes. Keep as many walls as possible between you and the outside.
- **Don't handle electrical equipment or telephones.** Use battery operated appliances only.

13.0 CONFINED SPACE ENTRY PROCEDURE

A confined space provides the potential for unusually high concentrations of contaminants, explosive atmospheres, oxygen deficient atmospheres, limited visibility, and restricted movement. Included in this definition is any excavation that is greater than or equal to four feet deep and has limited access. This section establishes requirements for safe entry into, continued work in, and safe exit from confined spaces. Additional information regarding confined space entry can be found in 29 CFR 1926.21, 29 CFR 1910.146, and NIOSH-106. Entry into a confined space will only be undertaken after remote methods have been tried and found not to be successful. If confined space entry is required, such work will only be undertaken following the guidelines presented in the CRA Health and Safety Programs or an approved contractor's Confined Space Entry Program. The contractor's Program must minimally meet the requirements of the CRA Program.

14.0 EMERGENCY RESPONSE

It is essential that Site personnel be prepared in the event of an emergency. Emergencies can take many forms; illnesses or injuries, chemical exposure, fires, explosions, spills, leaks, releases of harmful contaminants, or sudden changes in the weather (See Section 12 - Environmental Control Program). The following sections outline the general procedures for emergencies. Emergency information should be posted as appropriate. All serious emergencies will be reported to the local fire and/or police departments as well as the GMPT Bedford Facility Contact. Upon arriving at the Site, they will give CRA further direction as to the responsibilities during any emergency situation. It is possible they may wish to take the lead or they may ask CRA to take the lead.

14.1 EMERGENCY CONTACTS

Fire:911

Police:911

Ambulance:911

Main Hospital: Bedford Medical Center
2900 16th Street
Bedford, Indiana 47421
Telephone: 812-275-1200

Directions to the Hospital: Exit Trailer Complex and make right (south) onto GM Drive (0.3 miles). Go to Stop Sign and make right (West) onto 5th Street\SR 58 (0.7 miles). At red light make left (south) onto Lincoln Avenue (0.7 miles). Make right (west) onto Williams Boulevard (0.7 miles). Make left (south) onto Beech Street (0.7 miles). Make right (west) onto 16th Street\SR 50 (0.5 miles). Bedford Medical Center is on left (see Figure 14.1 for map).

Optional Hospital:Dunn Memorial Hospital
1600 23rd Street
Bedford, Indiana 47421
Telephone: 812-275-3331

Directions to the Hospital: Exit Trailer Complex and make right (south) onto GM Drive (0.3 miles). Go to Stop Sign and make right (West) onto 5th Street\SR 58 (0.7 miles). At red light make left (south) onto Lincoln Avenue (0.7 miles). Make right (west) onto 15th Street (0.8 miles). Make left (south) onto M Street (0.1 miles). Make

right (west) onto 25th Street (0.7 miles). Make a right into hospital entrance (see Figure 14.1 for map).

14.2 ADDITIONAL EMERGENCY NUMBERS

National Response Center (NRC).....	800-424-8802
Agency for Toxic Substances and Disease Registry	404-488-4100 (24 Hours)
Poison Control Center	800-942-5969
U.S. EPA Emergency Response	800-424-8802
State of Indiana Emergency Response Commission	317-243-5176
Underground Utilities Location Service.....	800-382-5544
GM Contact (Cheryl Hiatt).....	248-753-5799 (Office)
.....	313-510-4328 (Cell)
GM Contact (Ed Peterson).....	248-753-5849 (Office)
.....	313-506-9465 (Cell)
GM Contact (Laura Fitzpatrick).....	313-665-4881
CRA Project Manager (Glenn Turchan).....	519-884-0510
CRA Regional Manager of Safety and Health (Jeffrey Maranciak).....	412-963-7313 (Office)
.....	412-225-6375 (Cell)
CRA Overall Project Coordinator (Jim McGuigan)	773-380-9933 (Office)
.....	708-476-4793 (Cell)
CRA On-Site Construction Coordinator (Katie Kamm)	812-277-8954 (Office)
.....	651-295-7400 (Cell)
CRA On-Site HSO (Dan Nelson).....	812-277-8960 (Office)
.....	812-276-3505 (Cell)

14.3 EMERGENCY EQUIPMENT AVAILABLE ON SITE

<i>Communication Equipment</i>	<i>Location</i>
Emergency Alarms/Horns	CRZ

Medical Equipment

OSHA Approved First Aid Kit
Sized for a Minimum of 20 people
Portable Emergency Eyewash Bottles

CRZ/SZ and Each Site Vehicle

Fire Fighting Equipment

Two 20-Pound ABC Type Dry Chemical Fire Extinguishers
One 2.5-Pound ABC Type Dry Chemical Fire Extinguishers

CRZ
Each Site Vehicle

**14.4 PROJECT PERSONNEL RESPONSIBILITIES
DURING EMERGENCIES**

HEALTH AND SAFETY OFFICER (HSO)

As the administrator of the HASP, the HSO has primary responsibility for responding to and correcting emergency situations. The HSO will:

- i) take appropriate measures to protect personnel including: withdrawal from the EZ, total evacuation and securing of the Site or upgrading or downgrading the level of protective clothing and respiratory protection;
- ii) take appropriate measures to protect the public and the environment including isolating and securing the Site, preventing runoff to surface waters and ending or controlling the emergency to the extent possible;
- iii) ensure that appropriate Federal, State, and local agencies are informed, and emergency response plans are coordinated. In the event of fire or explosion, the local fire department should be notified immediately. In the event of an air release of toxic materials, local authorities should be informed in order to assess the need for evacuation. In the event of a spill, sanitary districts and drinking water systems may need to be alerted;
- iv) ensure that appropriate decontamination treatment or testing for exposed or injured personnel is obtained;
- v) determine the cause of the incident and make recommendations to prevent the recurrence;
- vi) ensure that Section 12 - Environmental Control Program is implemented when severe weather (flooding, tornado threats, high winds, rain/snow, etc.) threatens the Site; and
- vii) ensure that all required reports have been prepared.

14.5 MEDICAL EMERGENCIES

Any person who becomes ill or injured in the EZ must be decontaminated to the maximum extent possible. If the injury or illness is minor, full decontamination should be completed and first aid administered prior to transport. If the patient's condition is serious, at least partial decontamination should be completed as much as possible without causing further harm to the patient. First aid should be administered while awaiting an ambulance or paramedics. All injuries and illnesses must immediately be reported to the HSO and On-Site Construction Coordinator.

Any person transporting an injured/exposed person to a clinic or hospital for treatment should take with them directions to the hospital and a listing of the contaminants of concern to which they may have been exposed.

Any vehicle used to transport contaminated personnel will be cleaned or decontaminated as necessary.

14.6 FIRE OR EXPLOSION

In the event of a fire or explosion, the local fire department should be notified immediately. The local fire department may be deployed if there is a fire or the possibility of a fire or explosion. Upon their arrival, the HSO or designated alternate will advise the fire commander of the location, nature, and identification of the hazardous materials on Site. The nature of the emergency will dictate measures to be implemented.

If it is safe to do so, Site personnel may:

- i) if hazardous, report to the Agency On-Scene Coordinator and/or Project Manager;
- ii) use fire fighting equipment available on Site; or
- iii) remove or isolate flammable or other hazardous materials that may contribute to the fire.

14.7 SPILLS OR CONTAINER LEAKS

In the event of a spill or leak, Site personnel will:

- i) report spills and releases to the Agency On-Scene Coordinator, Project Manager, the NRC, and State Emergency Response Commission (SERC);
- ii) locate the source of the spillage and stop the flow if it can be done safely; and
- iii) begin containment and recovery of the spilled materials.

15.0 ACCIDENT/INCIDENT REPORTING PROCEDURES

All CRA personnel and there sub-contractors involved in a work-related accident, injury, illness, exposure or property loss must be reported to your supervisor, HSO, and *within 1 hour* to the CRA Accident/Incident Hotline (1-866-529-4886). CRA's Incident report form, located in Appendix F, must be filled out and provided to the HSO.

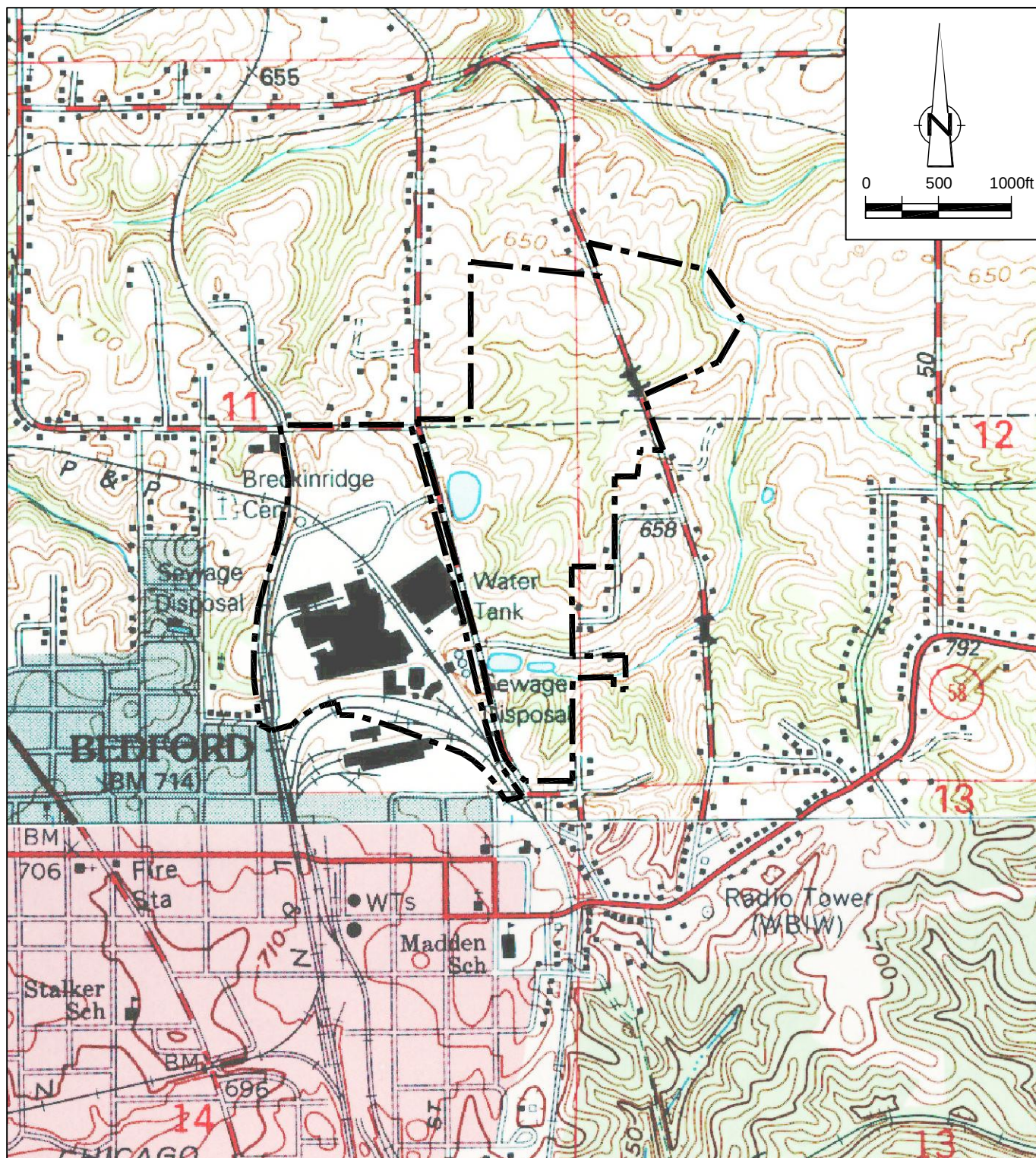
Personnel involved in a motor vehicle accident, regardless of fault, which involves a company vehicle, rental vehicle, or personal vehicle are responsible for contacting the CRA Accident Hotline immediately. Personnel must not leave the scene of the accident without prior authorization from local or state Police. Personnel should obtain copy of police report and include this in the CRA accident reporting form.

All personnel have the obligation and right to report unsafe acts or conditions, previously unrecognized safety hazards, or safety violations of others. If you wish to make such a report, it may be made orally to your supervisor or other member of management, or you may submit your concern in writing, either signed or anonymously.

16.0 RECORD KEEPING

The HSO shall establish and maintain records of all necessary and prudent monitoring activities as described below:

- i) name and job classification of the employees involved on specific tasks;
- ii) records of qualitative/quantitative fit testing and physical examination results for Site personnel;
- iii) daily air monitoring/sampling logs and daily instrument calibration logsheets;
- iv) air sampling results;
- v) maintaining a Site safety logbook;
- vi) records of all OSHA training certification for Site personnel;
- vii) records of training acknowledgment forms; and
- viii) emergency reports describing any incidents or accidents.



BASE SOURCE: USGS 7.5 MINUTE TOPOGRAPHIC QUADRANGLES;
 BARTLETTSVILLE, INDIANA 1994
 BEDFORD EAST, INDIANA 1978
 BEDFORD WEST, INDIANA 1993
 OOLITIC, INDIANA 1987

LEGEND

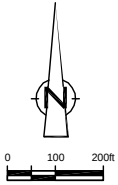
--- FACILITY BOUNDARY



figure 1.1
 SITE LOCATION
 GM POWERTRAIN BEDFORD FACILITY
Bedford, Indiana



N2	Revision	Date	Initial



- LEGEND
- EXISTING GROUND SURFACE ELEVATION CONTOURS (feet AMSL)
 - APPROXIMATE GM PROPERTY BOUNDARY
 - STREAMS
 - FENCE LINE
 - RAILROAD TRACKS
 - DIRT ROADS
 - ROADS / PAVED AREAS

SCALE VERIFICATION

THIS BAR MEASURES 1" ON ORIGINAL. ADJUST SCALE ACCORDINGLY.



Approved

DRAWING STATUS

Status	Date	Initial

GM POWERTRAIN BEDFORD FACILITY
BEDFORD, INDIANA

SITE PLAN



Source Reference:
BASE MAP COMPLETED BY AIR-LAND SURVEYS, FLINT, MI. APRIL 2001

Project Manager: J.M.	Reviewed By: M.K.	Date: NOVEMBER 2004
Scale: AS SHOWN	Project N2: 13968-00	Report N2: 095
		Drawing N2: figure 1.2

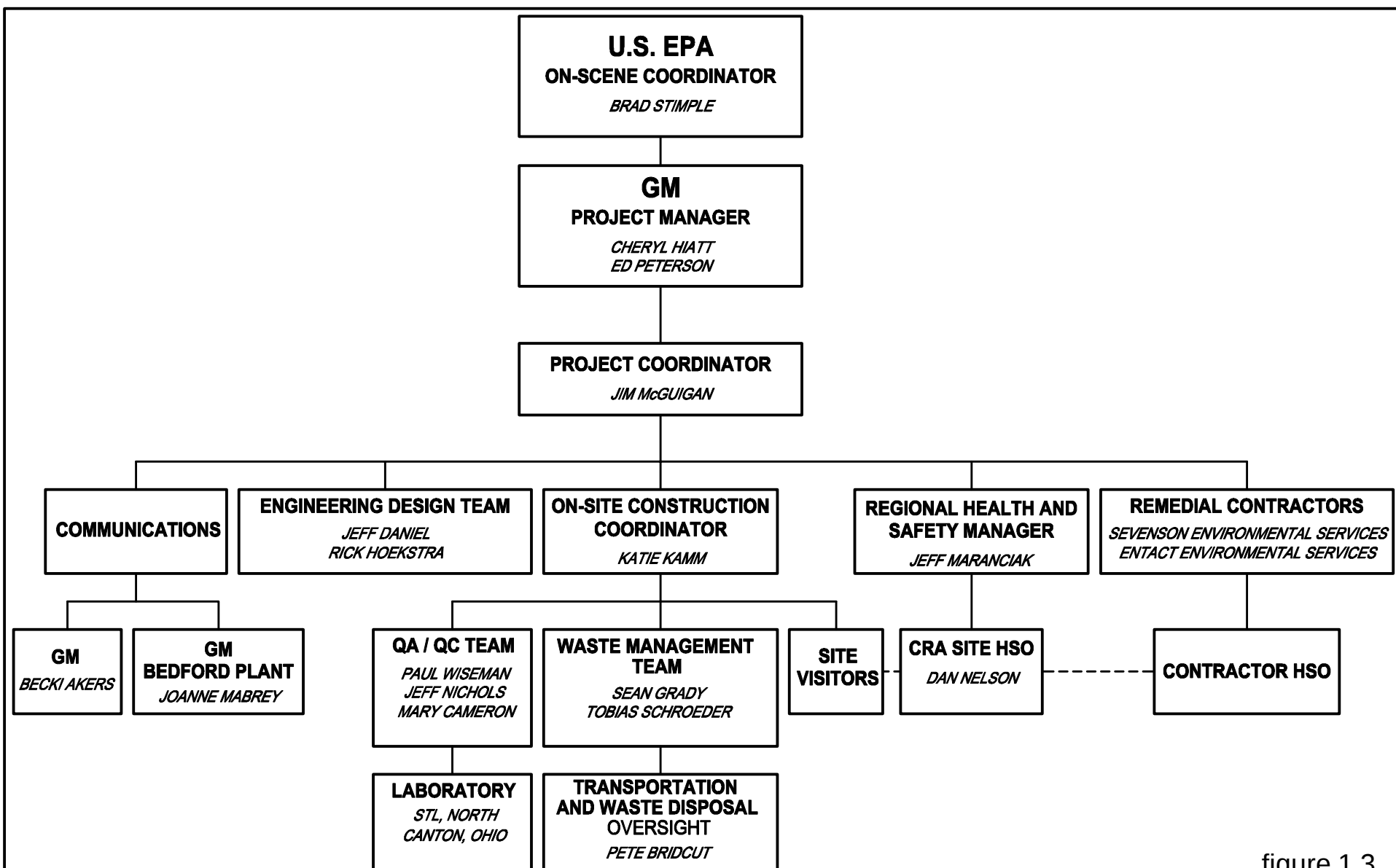
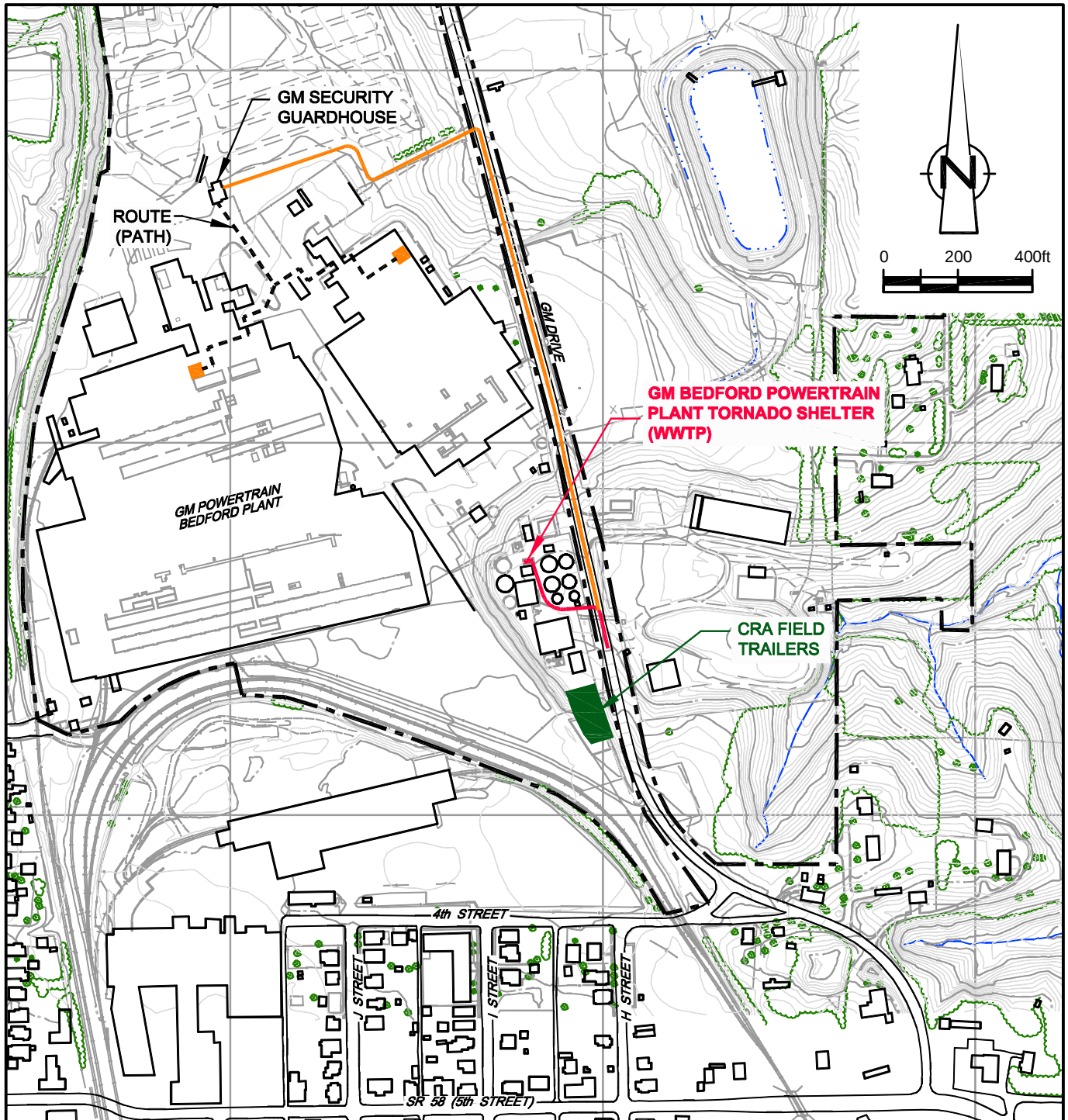


figure 1.3

PROJECT TEAM ORGANIZATION
GM POWERTRAIN BEDFORD FACILITY
Bedford, Indiana





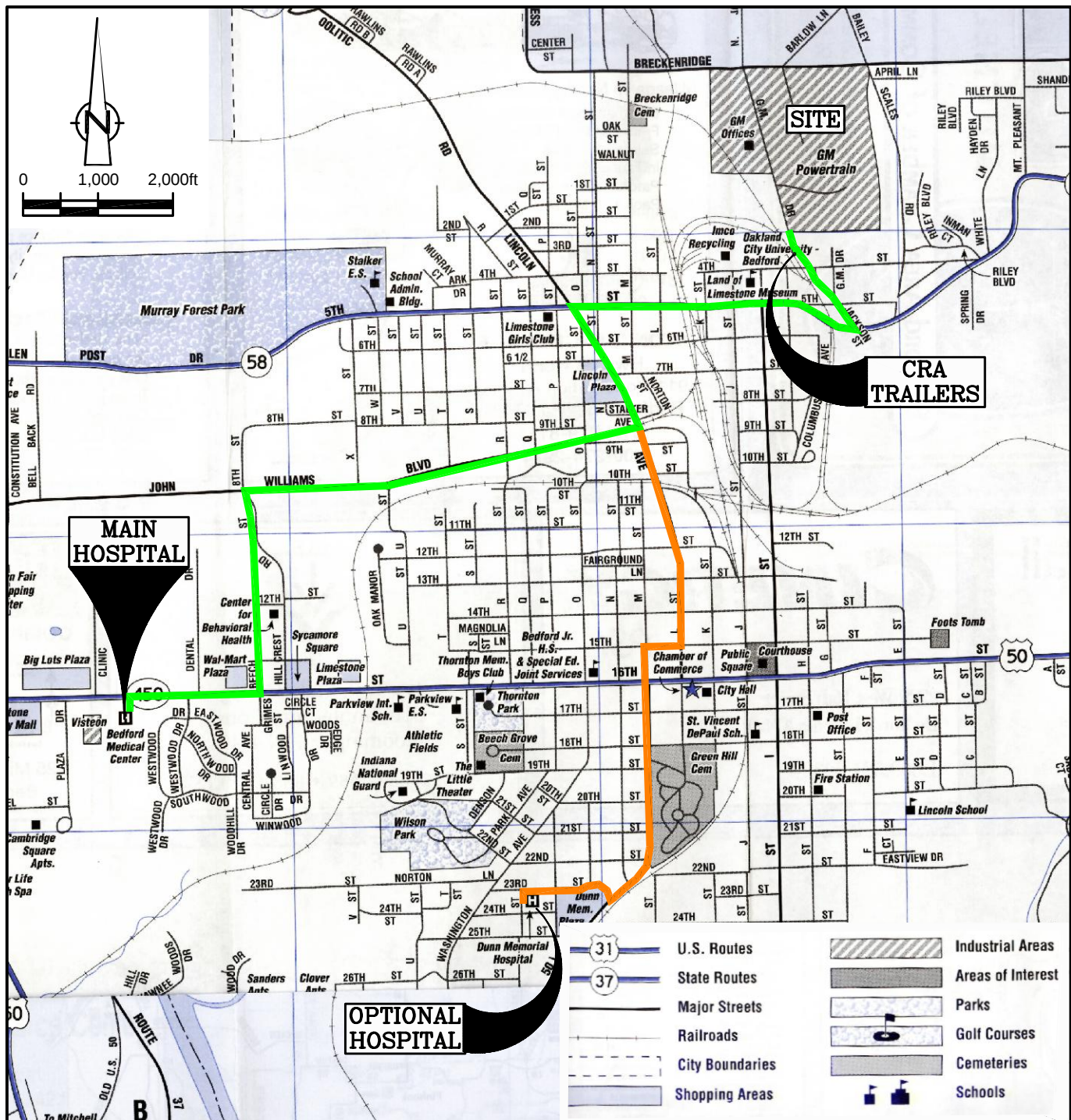
LEGEND

	EXISTING GROUND SURFACE ELEVATION CONTOURS (feet AMSL)		ROADS / UNPAVED AREAS
	EXISTING VEGETATION		ROADS / PAVED AREAS
	EXISTING BUILDINGS		APPROXIMATE SURFACE WATER LOCATION
	FENCE LINE		APPROXIMATE GM PROPERTY BOUNDARY
	RAILROAD TRACKS		PRIMARY TORNADO SHELTER
	DIRT ROADS		SECONDARY TORNADO SHELTER

figure 12.1

TORNADO SHELTER LOCATIONS GM POWERTRAIN BEDFORD FACILITY *Bedford, Indiana*





DIRECTIONS TO BEDFORD MEDICAL CENTER (812 275 1200)

1. Leave office trailer and make left (South) on GM Dr. (0.3 miles)
2. At stop sign make right (West) on to 5th St. (0.7 miles).
3. At Red light make left (South) on to Lincoln Ave. (0.7 miles).
4. Make right (West) on to Williams Blvd. (0.7 miles).
5. Make left (South) on to Beech St. (0.7 miles).
6. Make a right (West) on to 16th St. (0.5 miles).
7. Bedford Medical Center on left (South).
8. Directions for optional hospital are included in Section 14 of the HASP.

BASE SOURCE: HAMPTON PUBLISHING CO.



figure 14.1

HOSPITAL ROUTE MAP GM POWERTRAIN BEDFORD FACILITY *Bedford, Indiana*



TABLE 6.1

**SPECIFIC PERSONAL PROTECTION LEVELS
REMEDIAL ACTION ACTIVITIES
GMPT - BEDFORD PLANT
BEDFORD, INDIANA**

<i>Work Task</i>	<i>Expected Maximum Protection Level (1)</i>	<i>Alternate Protection Level (2)</i>
Mobilization and demobilization of labor, materials, and equipment to and from the Site	Modified D	D
Oversight of construction activities: Staging area construction; placement of designated materials within the staging area and subsequent off-Site transportation and disposal of impacted materials; contractor mobilization, demobilization, decontamination, and setup activities; Site clearing/tree removal; stormwater control construction; excavation, handling and backfilling activities; stream monitoring and water management activities; air monitoring/sampling; and Site restoration activities	Level C	Modified D Level D
Drilling (investigative) activities	Level C	Modified D Level D
Sampling and monitoring (investigative) activities	Modified D	Level D
Perimeter air monitoring activities	Modified D	Level D
Test pit excavations and associated activities (Note: If intact drums are encountered then the CRA HSO and On-Site Coordinator will implement the CRA Drum Handling Program.)	Level B	Level C Modified D
Site restoration activities	Modified D	Level D
Personnel and equipment decontamination activities	Level C	Modified D Level D

Notes:

Specific requirements for protection levels are detailed in Section 6.1.

- (1) Level B: To be worn when the highest level of respiratory protection is needed. Activities associated with the test pitting operations may require the use of Level B protection. If above background PID readings are encountered and CRA is unable to identify and quantify the contaminants then Level B protection will be necessary (see Section 6.5 for additional information). If readings subside workers will be able to downgrade. All unknown intact drums will be handled in Level B.
Level C: To be worn when the criterion for using air purifying respirators (APRs) are met and a lesser level of skin protection is needed.
Modified D: To be worn when dermal protection is required; however, no respiratory hazards are present. It provides minimal protection against chemical hazards.
- (2) Alternate protection levels will be used if monitoring indicates that conditions are appropriate or the HSO and On-Site Construction Coordinator agree that there is a reduced potential of exposure.

**ANTICIPATED HAZARDS/RISKS AND HAZARD CONTROLS
REMEDIAL ACTION ACTIVITIES
GMPT - BEDFORD PLANT
BEDFORD, INDIANA**

Activity: DECONTAMINATION OF PERSONNEL AND EQUIPMENT

Description of Task	Potential Hazards	Preventative Measures and Controls	PPE
Personnel and Equipment Decontamination Activities	Slip, Trip, Falls	Use three points of contact to mount and dismount equipment. Continuously inspect work areas for slip, trip & fall hazards. Be aware of surroundings. Practice good housekeeping.	Modified D: Hard hat; high visibility safety vest; safety glasses; safety-toed boots; Tyvek or polycoated Tyvek coveralls (as needed); inner/ outer gloves; boot covers/ rubber booties; faceshield or goggles (as needed); and hearing protection (as necessary).
	Electrical Hazards	GFCIs will be used to reduce electric shock. All electrical equipment will be inspected prior to use according to CRA SOPs. Do not stand in water when using electrical equipment. All electrical equipment will be UL/FM approved.	
	Heat/Cold Stress	Dress appropriately and follow guidelines found in the HASP. Drink sports drinks/plenty of water and use cooling devices.	
	Biological Hazards - Insects, Snakes, Poison Plants, etc.	Wear appropriate PPE and keep necessary first aid supplies readily available. Use insect repellant and snake chaps as needed and follow guidelines presented in the HASP. Practice good personal hygiene - wash hands and face regularly. Learn to identify poisonous plants, insects and snakes.	Contingency: Level C: Modified Level D plus full-face APR with OV/Acid Gas and P-100 Cartridges.
	Dangerous Weather Conditions	Consult local weather reports daily, watch for signs of severe weather, use portable, battery-powered weather radio, etc. Suspend or reduce work during severe weather.	
	Pinch Points and Sharp Objects	Keep hands, feet, & clothing away from moving parts/devices. Use appropriate PPE and select the proper tool for the job. Provide barriers and/or signage indicating swing radius of equipment, according to CRA's SOPs.	
	Fueling Equipment	No smoking, allow device to cool before re-fueling, follow storage requirements (reference MSDS).	

TABLE 7.1

**ANTICIPATED HAZARDS/RISKS AND HAZARD CONTROLS
REMEDIAL ACTION ACTIVITIES
GMPT - BEDFORD PLANT
BEDFORD, INDIANA**

Description of Task	Potential Hazards	Preventative Measures and Controls	PPE
	Chemical Hazards	Follow air monitoring program and wear proper PPE.	
	Heavy Lifting	Follow safe lifting practices in the HASP. Lift items within your capabilities. Ask for assistance if necessary. Limit single person lifts to 50 pounds or less unless a lifting device (dolley, lift truck, etc.) is used.	
	Moving Heavy Equipment and Vehicles	Inspect work area and be aware of surroundings at all times. Establish traffic patterns and wear safety vests. Use a spotter around moving or backing equipment.	
	Use of Hand & Power Tools	Follow manufacturer’s safety precautions, inspect tools daily prior to use, replace or remove defective tools, wear the appropriate eye and foot protection.	
	Noise	Wear appropriate hearing protection if noise levels exceed 85 dBA. Follow CRA Hearing Conservation Program.	
Training Requirements			
- Inspect site daily to recognize and correct hazards (inspect equipment before using); - Hazard Communication; 40-Hour HAZWOPER and 8-Hour Refresher (as necessary); - Personal Protective Equipment ; and - Site specific training on specific site tasks (i.e., use of pressure washer).			

**ANTICIPATED HAZARDS/RISKS AND HAZARD CONTROLS
REMEDIAL ACTION ACTIVITIES
GMPT - BEDFORD PLANT
BEDFORD, INDIANA**

Activity: MOBILIZATION AND DEMOBILIZATION ACTIVITIES AND SITE RESTORATION ACTIVITIES

Description of Task	Potential Hazards	Preventative Measures and Controls	PPE
Mobilization and Demobilization of Equipment, Materials and Personnel and Site Restoration Activities	Slip, Trip, Falls	Use three points of contact to mount/dismount machinery. Continuously inspect work areas for slip, trip & fall hazards. Be aware of surroundings. Practice good housekeeping.	Level D: Hard hat; high-visibility safety vest; safety glasses; hearing protection (as necessary); work gloves; and safety-toed boots. Contingency - Modified D: Hard hat; high visibility safety vest; safety glasses; safety-toed boots; Tyvek or polycoated Tyvek coveralls (as needed); inner/ outer gloves; and boot covers/ rubber booties; and hearing protection (as necessary).
	Electrical Hazards	GFCIs will be used to reduce electric shock. All electrical equipment will be inspected prior to use according to CRA SOPs. Do not stand in water when using electrical equipment. All electrical equipment will be UL/FM approved.	
	Heat/Cold Stress	Dress appropriately and follow guidelines found in the HASP. Drink sports drinks/plenty of water and use cooling devices.	
	Biological Hazards - Insects, Snakes, Poison Plants, etc.	Wear appropriate PPE and keep necessary first aid supplies readily available. Use insect repellant and snake chaps as needed and follow guidelines presented in the HASP. Practice good personal hygiene - wash hands and face regularly. Learn to identify poisonous plants, insects and snakes.	
	Dangerous Weather Conditions	Consult local weather reports daily, watch for signs of severe weather, use portable, battery-powered weather radio, etc. Suspend or reduce work during severe weather.	
	Pinch Points and Sharp Objects	Keep hands, feet, & clothing away from moving parts/devices. Use appropriate PPE and select the proper tool for the job. Provide barriers and/or signage indicating swing radius of equipment, according to CRA's SOPs.	
	Fueling Equipment	No smoking, allow device to cool before re-fueling, follow storage requirements (reference MSDS).	

TABLE 7.1

**ANTICIPATED HAZARDS/RISKS AND HAZARD CONTROLS
REMEDIAL ACTION ACTIVITIES
GMPT - BEDFORD PLANT
BEDFORD, INDIANA**

Description of Task	Potential Hazards	Preventative Measures and Controls	PPE
	Heavy Lifting	Follow safe lifting practices in the HASP. Lift items within your capabilities. Ask for assistance if necessary. Limit single person lifts to 50 pounds or less unless a lifting device (dolley, lift truck, etc.) is used.	
	Moving Heavy Equipment and Vehicles	Inspect work area and be aware of surroundings at all times. Establish traffic patterns and wear safety vests. Use a spotter around moving or backing equipment.	
	Noise	Wear appropriate hearing protection if noise levels exceed 85 dBA. Follow CRA Hearing Conservation Program.	
	Utilities	Maintain proper utility clearances – Use a spotter if necessary. All utilities will be located prior to conducting work.	
	Use of Hand & Power Tools	Follow manufacturer’s safety precautions, inspect tools daily prior to use, replace defective tools, wear the appropriate eye and foot protection.	
Training Requirements			
- Inspect site daily to recognize and correct hazards (inspect equipment and hand/power tools daily/before use); - Hazard Communication; - Personal Protective Equipment ; and - Site-specific training on specific site tasks and safety procedures.			

**ANTICIPATED HAZARDS/RISKS AND HAZARD CONTROLS
REMEDIAL ACTION ACTIVITIES
GMPT - BEDFORD PLANT
BEDFORD, INDIANA**

Activity: OVERSIGHT OF REMEDIAL CONTRACTOR ACTIVITIES

Description of Task	Potential Hazards	Preventative Measures and Controls	PPE
Oversight of Contractor(s) Performing Remedial Action Activities	Slip, Trip, Falls	Use three points of contact to mount/dismount machinery. Continuously inspect work areas for slip, trip & fall hazards. Be aware of surroundings. Practice good housekeeping.	Level D: Hard hat; high-visibility safety vest; safety glasses; hearing protection (as necessary); work gloves; and safety-toed boots. Modified D: Hard hat; high visibility safety vest; safety glasses; safety-toed boots; Tyvek or polycoated Tyvek coveralls (as needed); inner/ outer gloves; and boot covers/ rubber booties; and hearing protection (as necessary). Contingency - Level C: Modified Level D plus full-face APR with OV/Acid Gas and P-100 Cartridges.
	Electrical Hazards	GFCIs will be used to reduce electric shock. All electrical equipment will be inspected prior to use according to CRA SOPs. Do not stand in water when using electrical equipment. All electrical equipment will be UL/FM approved.	
	Heat/Cold Stress	Dress appropriately and follow guidelines found in the HASP. Drink sports drinks/plenty of water and use cooling devices.	
	Biological Hazards - Insects, Snakes, Poison Plants, etc.	Wear appropriate PPE and keep necessary first aid supplies readily available. Use insect repellent and snake chaps as needed and follow guidelines presented in the HASP. Practice good personal hygiene - wash hands and face regularly. Learn to identify poisonous plants, insects and snakes.	
	Dangerous Weather Conditions	Consult local weather reports daily, watch for signs of severe weather, use portable, battery-powered weather radio, etc. Suspend or reduce work during severe weather.	
	Pinch Points and Sharp Objects	Keep hands, feet, & clothing away from moving parts/devices. Use appropriate PPE and select the proper tool for the job. Provide barriers and/or signage indicating swing radius of equipment, according to CRA's SOPs.	

TABLE 7.1

**ANTICIPATED HAZARDS/RISKS AND HAZARD CONTROLS
REMEDIAL ACTION ACTIVITIES
GMPT - BEDFORD PLANT
BEDFORD, INDIANA**

Description of Task	Potential Hazards	Preventative Measures and Controls	PPE
	Chemical Hazards	Wear proper PPE. Follow air monitoring program. Ensure that Site is properly demarcated – Follow proper Site control measures as outlined in the HASP.	
	Heavy Lifting	Follow safe lifting practices in the HASP. Lift items within your capabilities. Ask for assistance if necessary. Limit single person lifts to 50 pounds or less unless a lifting device (dolley, lift truck, etc.) is used.	
	Moving Heavy Equipment and Vehicles	Inspect work area and be aware of surroundings at all times. Establish traffic patterns and wear safety vests. Use a spotter around moving or backing equipment.	
	Ladder Safety Hazards	Provide training to affected personnel on the safe use and inspection of ladders. Enforce compliance.	
	Fall Hazards	Maintain a 100% tie-off at/above 6 feet, follow a fall protection program in accordance with 29 CFR 1926 – Subpart M, and provide appropriate training to affected personnel. See guidelines contained in the HASP.	
	Excavation Hazards	Ensure that all excavation activities are conducted according to procedures outlined in the HASP and according to 29 CFR 1926 - Subpart P. Contractor is to designate a “competent person” that is responsible for meeting all requirements of Subpart P.	
	Utilities	Maintain proper utility clearances – Use a spotter if necessary. All utilities will be located prior to conducting work.	

TABLE 7.1

**ANTICIPATED HAZARDS/RISKS AND HAZARD CONTROLS
REMEDIAL ACTION ACTIVITIES
GMPT - BEDFORD PLANT
BEDFORD, INDIANA**

Description of Task	Potential Hazards	Preventative Measures and Controls	PPE
	Use of Hand & Power Tools	Follow manufacturer’s safety precautions, inspect tools daily prior to use, replace defective tools, wear the appropriate eye and foot protection.	
	Noise	Wear appropriate hearing protection if noise levels exceed 85 dBA. Follow CRA Hearing Conservation Program.	
Training Requirements			
• Hazard Communication; • Inspect site daily to recognize and correct hazards (inspect equipment and hand/power tools daily/before use); • Site-specific training on specific site tasks and safety procedures. • 40-Hour HAZWOPER, 8-Hour Refresher (as necessary) and 8-Hour HAZWOPER Supervisory Training (as necessary); and • Personal Protective Equipment.			

**ANTICIPATED HAZARDS/RISKS AND HAZARD CONTROLS
REMEDIAL ACTION ACTIVITIES
GMPT - BEDFORD PLANT
BEDFORD, INDIANA**

Activity: DRILLING (INVESTIGATIVE) ACTIVITIES

Description of Task	Potential Hazards	Preventative Measures and Controls	PPE
Installation of Monitoring Wells, etc.	Slips/Trips/Falls	Use three points of contact to mount/dismount machinery. Continuously inspect work areas for slip, trip & fall hazards. Be aware of surroundings. Practice good housekeeping.	Modified D: Safety glasses; hard hat; ear plugs/muffs; inner gloves; work gloves; Tyvek coveralls (as needed); and safety-toed boots. Contingency - Level C: Modified Level D plus full-face APR with OV/Acid Gas and P-100 Cartridges.
	Electrical Hazards	GFCIs will be used to reduce electric shock. All electrical equipment will be inspected prior to use according to CRA SOPs. Do not stand in water when using electrical equipment. All electrical equipment will be UL/FM approved.	
	Heat/Cold Stress	Dress appropriately and follow guidelines found in the HASP. Drink sports drinks/plenty of water and use cooling devices.	
	Biological Hazards - Insects, Snakes, Poison Plants, etc.	Wear appropriate PPE and keep necessary first aid supplies readily available. Use insect repellant and snake chaps as needed and follow guidelines presented in the HASP. Practice good personal hygiene - wash hands and face regularly. Learn to identify poisonous plants, insects and snakes.	
	Dangerous Weather Conditions	Consult local weather reports daily, watch for signs of severe weather, use portable, battery-powered weather radio, etc. Suspend or reduce work during severe weather.	
	Pinch Points and Sharp Objects	Keep hands, feet, & clothing away from moving parts/devices. Use appropriate PPE and select the proper tool for the job. Provide barriers and/or signage indicating swing radius of equipment, according to CRA's SOPs.	
	Fueling Equipment	No smoking, allow device to cool before re-fueling and follow proper storage requirements.	

TABLE 7.1

**ANTICIPATED HAZARDS/RISKS AND HAZARD CONTROLS
REMEDIAL ACTION ACTIVITIES
GMPT - BEDFORD PLANT
BEDFORD, INDIANA**

Description of Task	Potential Hazards	Preventative Measures and Controls	PPE
	Chemical Hazards	Wear proper PPE. Follow air monitoring program. Ensure that Site is properly demarcated - Follow proper Site control measures as outlined in the HASP.	
	Heavy Lifting	Follow safe lifting practices in the HASP. Lift items within your capabilities. Ask for assistance if necessary. Limit single person lifts to 50 pounds or less unless a lifting device (dolley, lift truck, etc.) is used.	
	Moving Heavy Equipment and Vehicles	Inspect work area and be aware of surroundings at all times. Establish traffic patterns and wear safety vests. Use a spotter around moving or backing equipment.	
	Fall Hazards	Maintain a 100% tie-off at/above 6 feet, follow a fall protection program in accordance with 29 CFR 1926 - Subpart M, and provide appropriate training to affected personnel. See guidelines contained in the HASP.	
	Use of Hand & Power Tools	Follow manufacturer's safety precautions, inspect tools daily prior to use, replace defective tools, wear the appropriate eye and foot protection.	
	Rigging	Inspect rigging before each use.	
	Utilities	Maintain proper utility clearances. All utilities will be located prior to conducting work. Conduct an underground utility search.	
	Hazards Associated with Drilling: Proximity of Drill Rig, etc.	Beware of drill rig and struck-by hazards. Ensure that driller conducts daily inspections and follows safe work practices. Drilling contractor will provide and implement a Site-specific HASP for its scope of work.	

TABLE 7.1

**ANTICIPATED HAZARDS/RISKS AND HAZARD CONTROLS
REMEDIAL ACTION ACTIVITIES
GMPT - BEDFORD PLANT
BEDFORD, INDIANA**

Description of Task	Potential Hazards	Preventative Measures and Controls	PPE
	Noise	Wear appropriate hearing protection if noise levels exceed 85 dBA. Follow the CRA and drilling contractor's Hearing Conservation Program.	
Training Requirements			
• Hazard Communication; • 40-Hour HAZWOPER, 8-Hour Refresher (as necessary) and 8-Hour HAZWOPER Supervisory Training (as necessary); and • Personal Protective Equipment; • Inspect site daily to recognize and correct hazards (inspect equipment and hand/ power tools daily/before use); • Inspect drill rig daily; and • Site-specific training on specific tasks (drilling safety procedures, etc.).			

**ANTICIPATED HAZARDS/RISKS AND HAZARD CONTROLS
REMEDIAL ACTION ACTIVITIES
GMPT - BEDFORD PLANT
BEDFORD, INDIANA**

Activity: AIR MONITORING ACTIVITIES

Description of Task	Potential Hazards	Preventative Measures and Controls	PPE
Air Sampling Activities - Collection and Deployment of Sampling Media, Calibration, Operation and Maintenance of Samplers, etc.	Slips/Trips/Falls	Use three points of contact to mount/dismount machinery. Continuously inspect work areas for slip, trip & fall hazards. Be aware of surroundings. Practice good housekeeping.	Level D: Hard hat; high-visibility safety vest; safety glasses; hearing protection (as necessary); work gloves; and safety-toed boots. Contingency - Modified D: Hard hat; high visibility safety vest; safety glasses; safety-toed boots; Tyvek or polycoated Tyvek coveralls (as needed); inner/ outer gloves; and boot covers/ rubber booties; and hearing protection (as necessary).
	Electrical Hazards	GFCIs will be used to reduce electric shock. All electrical equipment will be inspected prior to use and according to CRA SOPs. Do not stand in water when using electrical equipment. All electrical equipment will be UL/FM approved.	
	Heat/Cold Stress	Dress appropriately and follow guidelines found in the HASP. Drink sports drinks/plenty of water and use cooling devices.	
	Biological Hazards - Insects, Snakes, Poison Plants, etc.	Wear appropriate PPE and keep necessary first aid supplies readily available. Use insect repellent and snake chaps as needed and follow guidelines presented in the HASP. Practice good personal hygiene - wash hands and face regularly. Learn to identify poisonous plants, insects and snakes.	
	Dangerous Weather Conditions	Consult local weather reports daily, watch for signs of severe weather, use portable, battery-powered weather radio, etc. Suspend or reduce work during severe weather.	
	Pinch Points and Sharp Objects	Keep hands, feet, & clothing away from moving parts/devices. Use appropriate PPE and select the proper tool for the job. Provide barriers and/or signage indicating swing radius of equipment, according to CRA's SOPs.	

**ANTICIPATED HAZARDS/RISKS AND HAZARD CONTROLS
REMEDIAL ACTION ACTIVITIES
GMPT - BEDFORD PLANT
BEDFORD, INDIANA**

Description of Task	Potential Hazards	Preventative Measures and Controls	PPE
	Chemical Hazards	Wear proper PPE. Follow air monitoring program. Ensure that Site is properly demarcated – Follow proper Site control measures as outlined in the HASP.	
	Heavy Lifting	Follow safe lifting practices in the HASP. Lift items within your capabilities. Ask for assistance if necessary. Limit single person lifts to 50 pounds or less unless a lifting device (dolley, lift truck, etc.) is used.	
	Moving Heavy Equipment and Vehicles	Inspect work area and be aware of surroundings at all times. Establish traffic patterns and wear safety vests. Use a spotter around moving or backing equipment.	
	Use of Hand & Power Tools	Follow manufacturer’s safety precautions, inspect tools daily prior to use, replace defective tools, wear the appropriate eye and foot protection.	
	Noise	Wear appropriate hearing protection if noise levels exceed 85 dBA.	
Training Requirements			
• Hazard Communication; • Inspect site daily to recognize and correct hazards (inspect equipment and hand/power tools daily/before use); • Site-specific training on specific site tasks and safety procedures. • 40-Hour HAZWOPER and 8-Hour Refresher (as necessary); and • Personal Protective Equipment.			

**ANTICIPATED HAZARDS/RISKS AND HAZARD CONTROLS
REMEDIAL ACTION ACTIVITIES
GMPT - BEDFORD PLANT
BEDFORD, INDIANA**

Activity: SAMPLING AND MONITORING (INVESTIGATIVE) ACTIVITIES

Description of Task	Potential Hazards	Preventative Measures and Controls	PPE
Collect Monitoring Well Water Elevations; Water, Soil, Sediment, and Oil Samples; and Other Relevant Data Collection	Slips/Trips/Falls	Use three points of contact to mount/dismount machinery. Continuously inspect work areas for slip, trip & fall hazards. Be aware of surroundings. Practice good housekeeping.	Level D: Hard hat; high-visibility safety vest; safety glasses; hearing protection (as necessary); inner gloves; boot covers (as necessary) and safety-toed boots. Contingency - Modified D: Hard hat; high visibility safety vest; safety glasses; safety-toed boots; Tyvek or polycoated Tyvek coveralls (as needed); inner/ outer gloves; and boot covers/ rubber booties; and hearing protection (as necessary).
	Electrical Hazards	GFCIs will be used to reduce electric shock. All electrical equipment will be inspected prior to use and according to CRA SOPs. Do not stand in water when using electrical equipment. All electrical equipment will be UL/FM approved.	
	Heat/Cold Stress	Dress appropriately and follow guidelines found in the HASP. Drink sports drinks/plenty of water and use cooling devices.	
	Biological Hazards - Insects, Snakes, Poison Plants, etc.	Wear appropriate PPE and keep necessary first aid supplies readily available. Use insect repellent and snake chaps as needed and follow guidelines presented in the HASP. Practice good personal hygiene - wash hands and face regularly. Learn to identify poisonous plants, insects and snakes.	
	Dangerous Weather Conditions	Consult local weather reports daily, watch for signs of severe weather, use portable, battery-powered weather radio, etc. Suspend or reduce work during severe weather.	
	Pinch Points and Sharp Objects	Keep hands, feet, & clothing away from moving parts/devices. Use appropriate PPE and select the proper tool for the job. Provide barriers and/or signage indicating swing radius of equipment, according to CRA's SOPs.	
	Fueling Equipment	No smoking, allow device to cool before re-fueling, follow storage requirements (reference MSDS).	

TABLE 7.1

**ANTICIPATED HAZARDS/RISKS AND HAZARD CONTROLS
REMEDIAL ACTION ACTIVITIES
GMPT - BEDFORD PLANT
BEDFORD, INDIANA**

Description of Task	Potential Hazards	Preventative Measures and Controls	PPE
	Chemical Hazards	Wear proper PPE. Follow air monitoring program. Ensure that Site is properly demarcated – Follow proper Site control measures as outlined in the HASP.	
	Heavy Lifting	Follow safe lifting practices in the HASP. Lift items within your capabilities. Ask for assistance if necessary. Limit single person lifts to 50 pounds or less unless a lifting device (dolley, lift truck, etc.) is used.	
	Moving Heavy Equipment and Vehicles	Inspect work area and be aware of surroundings at all times. Establish traffic patterns and wear safety vests. Use a spotter around moving or backing equipment.	
	Fall Hazards	Maintain a 100% tie-off at/above 6 feet, follow a fall protection program in accordance with 29 CFR 1926 – Subpart M, and provide appropriate training to affected personnel. See guidelines contained in the HASP.	
Training Requirements			
- Inspect site daily to recognize and correct hazards (inspect equipment before using); - Hazard Communication; - Personal protective equipment; 40-Hour HAZWOPER and 8-Hour Refresher (as necessary); and - Site specific training on specific site tasks (i.e., use of sampling equipment).			

**ANTICIPATED HAZARDS/RISKS AND HAZARD CONTROLS
REMEDIAL ACTION ACTIVITIES
GMPT - BEDFORD PLANT
BEDFORD, INDIANA**

Activity: TEST PIT EXCAVATION ACTIVITIES

Description of Task	Potential Hazards	Preventative Measures and Controls	PPE
Excavation of Test Pits and Subsequent Sampling Activities	Slip, Trip, Falls	Use three points of contact to mount/dismount machinery. Continuously inspect work areas for slip, trip & fall hazards. Be aware of surroundings. Practice good housekeeping.	Modified D: Hard hat; high visibility safety vest; safety glasses; safety-toed boots; Tyvek or polycoated Tyvek coveralls (as needed); inner/ outer gloves; and boot covers/ rubber booties; and hearing protection (as necessary). Level C: Modified Level D plus full-face APR with OV/Acid Gas and P-100 Cartridges. Contingency-Level B: Modified D (with polycoated Tyvek or Saranex coveralls) and a supplied air respirator. Respirator is to be a positive pressure-demand SCBA or positive pressure-demand airline respirator with escape bottle for emergency egress purposes.
	Heat/Cold Stress	Dress appropriately and follow guidelines found in the HASP. Drink sports drinks/plenty of water and use cooling devices.	
	Biological Hazards - Insects, Snakes, Poison Plants, etc.	Wear appropriate PPE and keep necessary first aid supplies readily available. Use insect repellent and snake chaps as needed and follow guidelines presented in the HASP. Practice good personal hygiene - wash hands and face regularly. Learn to identify poisonous plants, insects and snakes.	
	Dangerous Weather Conditions	Consult local weather reports daily, watch for signs of severe weather, use portable, battery-powered weather radio, etc. Suspend or reduce work during severe weather.	
	Pinch Points and Sharp Objects	Keep hands, feet, & clothing away from moving parts/devices. Use appropriate PPE and select the proper tool for the job. Provide barriers and/or signage indicating swing radius of equipment, according to CRA's SOPs.	
	Fueling Equipment	No smoking, allow device to cool before re-fueling, follow storage requirements (reference MSDS).	
	Chemical Hazards	Wear proper PPE. Follow air monitoring program. Ensure that Site is properly demarcated - Follow proper Site control measures as outlined in the HASP.	

TABLE 7.1

**ANTICIPATED HAZARDS/RISKS AND HAZARD CONTROLS
REMEDIAL ACTION ACTIVITIES
GMPT - BEDFORD PLANT
BEDFORD, INDIANA**

Description of Task	Potential Hazards	Preventative Measures and Controls	PPE
	Heavy Lifting	Follow safe lifting practices in the HASP. Lift items within your capabilities. Ask for assistance if necessary. Limit single person lifts to 50 pounds or less unless a lifting device (dolley, lift truck, etc.) is used.	
	Moving Heavy Equipment and Vehicles	Inspect work area and be aware of surroundings at all times. Establish traffic patterns and wear safety vests. Use a spotter around moving or backing equipment.	
	Noise	Wear appropriate hearing protection if noise levels exceed 85 dBA.	
	Utilities	Maintain proper utility clearances. All utilities will be located prior to conducting work. Conduct an underground utility search/subsurface investigation.	
	Fall Hazards	Maintain a 100% tie-off at/above 6 feet, follow a fall protection program in accordance with 29 CFR 1926 - Subpart M, and provide appropriate training to affected personnel. See guidelines contained in the HASP.	
	Potential to Encounter Buried Drums - Intact	Follow CRA Drum Handling SOP. Utilize proper PPE and air monitoring procedures for unknown drums, etc.	
	Use of Hand & Power Tools	Follow manufacturer's safety precautions, inspect tools daily prior to use, replace defective tools, wear the appropriate eye and foot protection.	
	Excavation and Trenching Hazards	Ensure that all excavation activities are conducted according to procedures outlined in the HASP and according to 29 CFR 1926 - Subpart P. CRA will designate a "competent person" that is responsible for meeting all requirements of Subpart P.	

TABLE 7.1

**ANTICIPATED HAZARDS/RISKS AND HAZARD CONTROLS
REMEDIAL ACTION ACTIVITIES
GMPT - BEDFORD PLANT
BEDFORD, INDIANA**

Description of Task	Potential Hazards	Preventative Measures and Controls	PPE
Training Requirements			
- Inspect site daily to recognize and correct hazards (inspect equipment and hand/ power tools daily/ before use); - Hazard Communication; - Competent Person Training for Excavations for Person(s) Supervising Excavation(s); 40-Hour HAZWOPER, 8-Hour Refresher (as necessary) and 8-Hour HAZWOPER Supervisory Training (as necessary); and - Personal Protective Equipment ; and - Site-specific training on specific site tasks and safety procedures (drum handling, excavation safety, etc.).			

APPENDIX A

TRAINING ACKNOWLEDGEMENT FORM

TRAINING ACKNOWLEDGEMENT FORM

I have read and/or received instruction on the Site Safety Plan and understand the Site Safety Plan. I have been informed who to contact if I have any questions and know where to report any additional health and safety hazards. I agree to work to the safety plan guidelines and understand that failure to do so could result in removal from the Site.

<i>Date</i>	<i>Printed Name</i>	<i>Signature</i>	<i>Company</i>

APPENDIX B

DAILY SAFETY MEETING LOG



Safety Means Awareness
Responsibility Teamwork

Project Site: GM-Bedford

Project #: 013968

DAILY SAFETY MEETING

Safety Topic: _____ Date: _____

Weather: _____

ATTENDANCE ROSTER

- | | |
|-----------|-----------|
| 1. _____ | 14. _____ |
| 2. _____ | 15. _____ |
| 3. _____ | 16. _____ |
| 4. _____ | 17. _____ |
| 5. _____ | 18. _____ |
| 6. _____ | 19. _____ |
| 7. _____ | 20. _____ |
| 8. _____ | 21. _____ |
| 9. _____ | 22. _____ |
| 10. _____ | 23. _____ |
| 11. _____ | 24. _____ |
| 12. _____ | 25. _____ |
| 13. _____ | 26. _____ |

Trainer's Signature: _____

Equal
Employment
Opportunity Employer

REGISTERED COMPANY
ISO 9001
ENGINEERING DESIGN

APPENDIX C

GM POWERTRAIN GROUP – BEDFORD PLANT SAFETY AND FIRE SPECIFICATIONS FOR OUTSIDE CONTRACTORS



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1.0 Responsibility.

- 1.1 The contractor is responsible for the health and safety of his/her employees.
- 1.2 Each contractor shall have a competent supervisor/leader on the job site at all times.
- 1.3 The contractor is responsible for abiding by and enforcing the provisions of the Occupational Health and Safety Acts (General Industry / Construction).
- 1.4 The contractor is responsible for abiding by and enforcing the provisions of all applicable General Motors corporate, divisional and plant health, safety and fire prevention specifications as outlined within this procedure. The contractor, his/her employees, subcontractors and their employees shall abide by the same health, safety and fire prevention requirements placed upon GMPT Bedford Casting Plant employees.
- 1.5 The contractor is responsible for reporting all incidents (including serious near miss incidents) which have caused injury, or may have had the potential to cause injury, to personnel under their supervision. Upon occurrence, incidents shall be immediately reported to the GM project engineer or designated representative.

2.0 Access to plant premises and identifications.

- 2.1 Entrance onto GM plant property by contract personnel, subcontractors, and suppliers of materials shall be controlled by GM plant security.
- 2.2 Contractor employees must identify themselves to plant security upon entry, and to GM management upon demand.
- 2.3 GM plant security will maintain a daily record of all individuals entering and leaving the plant job site.
- 2.4 An approved contractors' employee list must be furnished, by the contractor, to GM plant security. The contractors' supervisor/leader is responsible updating this list as required.



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- 2.5 Upon verification of contractor employee identification, each individual will be issued a numbered GMPT Contractor's Badge daily. This badge must be worn on the front and above the waist of an outer garment, so as to be visible in plain sight at all times while on GMPT property.
- 2.6 Contractor's employees will be required to sign "in" and "out" on the contractor's register. Badges must be turned in as employees leave plant property through the security area.
- 3.0 Personal protective equipment.
- 3.1 All contractors working inside GMPT Bedford Casting Plant building areas, or areas outside the plant in the course of their work assignment, must wear approved ANSI Z87.1 safety glasses with permanently attached side-shields at all times.
- 3.1.1 Approved ANSI Z87.1 safety glasses with a "tint" greater than #1 are not permitted inside the GM Bedford plant buildings.
- 3.2 Steel toed shoes must be worn by each contractor employee while on the work site. Any deviations must be approved by the GM safety supervisor (e.g. roof work where additional traction/footing is required).
- 3.3 In specific areas of the plant, where additional safety equipment is required (e.g. hearing protection), specific requirements will be covered by the GM project engineer with the contractor before commencing work.
- 3.5 All contractors must provide, and require that their employees utilize hard hats in all tunnel areas, or any other areas where there is the possibility of falling/flying debris. The contractor is to post conspicuous warning signs regarding hard hat usage areas if there are situations created where debris can be falling/flying.
(Reference Federal Standard 29CFR1910.135 (a) (1)).



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4.0 Rules of personal conduct.

- 4.1 Alcoholic beverages are not permitted on GM property, nor are persons who have been drinking alcoholic beverages. Use, possession, distribution, or the sale of narcotics / illegal drugs on GM property is strictly prohibited. Violators will be prosecuted to the full extent of the law.
- 4.2 No gambling of any kind is allowed on GM property.
- 4.3 All contractor's employees are restricted to their specifically assigned work areas in the plant. They are not to wander around the plant, without escort from GM personnel.
- 4.4 Smoking is not permitted in plant areas designated as "no smoking."
- 4.5 Contractor employees found to be involved in the theft or misappropriation of employee / company property shall be subject to immediate and permanent removal from plant property.
- 4.6 Horseplay will not be tolerated.
- 4.7 GMPT Bedford shop rules regarding personal hygiene (e.g. toilet facilities) must be adhered to.
- 4.8 The GM plant health services department will only be available to contractor employees for extreme medical emergencies.
- 4.9 Under no circumstances will contractor employees be permitted on GM property without proper attire. Shirts with short-sleeves are required. Tanks tops and sleeveless shirts are not permitted.
- 4.10 Answers to general questions while on GM property can be obtained by calling GM plant security (Ext. 7360). Company telephones are not to be used by contractor personnel except GM related contractor business.
- 4.11 Contractor refusal to cooperate with members of GM plant security in the performance of their duties will result in the contractor employee being denied access to GM property.

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4.12 Compressed air must never be directed at another employee.

*5.0 Housekeeping.

- *5.1 Contractors must keep work areas clean, orderly, and safe. All surplus material, rubbish, and debris *should be cleaned-up daily or at times designated by GMPT Bedford.*
- 5.2 Loose materials such as bolts, nuts, hand tools, and any other materials must not be left laying on beams, ledges, or any place from where they could fall or be knocked down at a later time. Contractors must make provisions while working to prevent tools, materials, etc., from falling.
- *5.3 Wipe up *incidental spills of oil, grease, water or other substances immediately and notify in-plant contact that spill occurred and action taken. If a spill is beyond the control of the contractor or could impact health, safety, or the environment contact plant security at x-7333 and report the chemical spill.*
- 5.4 Pipes, conduits, or structural steel must not be left hanging unguarded where they would constitute a hazard.
- 5.5 Boards with protruding nails or other loose material must not be left on floor where they may be stepped on or become tripping hazards. Holes, inserts, bolts or other tripping hazards on floor must not be left unguarded.
- 5.6 All equipment must be returned to contractors assigned storage area at the end of the working period; exceptions to this rule should be reviewed by the GM plant engineering department.
- 5.7 All lunch bags, coffee cups, sandwich wrappings, etc., are to be placed in proper disposal containers furnished by contractor. **Aluminum beverage cans and glass bottles are not permitted on GM property at any time.**
- 5.8 All pressurized cans or containers must be approved by the GM project engineer in advance. If used, the container(s) shall be removed from the premises by contractors. GM plant security will keep track of all full containers entering the property and all empty containers leaving the property. All



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containers must be accounted for. **Containers must not be thrown in GMPT Bedford trash containers, as a serious molten metal explosion may result if a container comes in contact with molten metal.**

- 5.9 Contractors will be assigned designated areas in which they may park vehicles, store tools, and store materials.
- 6.0 Acetylene and oxygen cylinders.
 - 6.1 All acetylene and oxygen bottles (including empties) must be secured upright by chains on carts. No bottles shall be loose on the floor or roof areas.
 - 6.2 Always transport acetylene and oxygen bottles in an upright position with caps on, unless a gauge is attached.
 - 6.3 When it is necessary to transport acetylene and oxygen bottles by a crane or hoist, an approved rack must be used. (Never use a sling or choker.) Rack or cart to be furnished by contractor.
 - 6.4 While welding or burning operations are in process, the wrench to the acetylene cylinder must always be in place.
- 7.0 Welding and cutting procedure.
 - 7.1 A "Welding or Burning Permit" must be obtained daily from GM plant security before any welding or cutting job is started on the GM property. The welding or burning permit is issued for a specific area, not a general area.
 - 7.2 All welding and burning equipment is subject to inspection by GM plant security and management.
 - 7.3 It is imperative that all welding on any machine must have a proper ground connection to the machine on which the welding is being done.
 - 7.4 Contractor electric welding machines shall be equipped with plugs that fit the GMPT Bedford standard outlets.
 - 7.5 An approved fire extinguisher furnished by the contractor must be at the location prior to, and during all welding and cutting operations.



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- 7.6 It is the contractors' responsibility to understand how to operate both fire extinguishers and fire fighting equipment under their control.
- 7.7 When plant fire equipment is used, notify GM plant security as soon as possible.
- 7.8 If GMPT personnel deem that a work area needs to be protected from welding and cutting operations, the contractor is responsible for that protection. The contractor is also responsible for cleaning and/or changing the protective cover or curtain daily. If a spotter is required, the contractor will be responsible for furnishing one.
- 7.9 No welding or cutting is to be done on the structural steel of the building without authorization from the GM plant engineering department.
- 7.10 A fire watch shall be required if the vision of the person welding is restricted by a welder's hood or other personal protective equipment.
- 8.0 Contractor vehicles.
- 8.1 All contractor vehicles entering the plant gates must be identified with the company name or logo.
- 8.2 Contractor owned vehicles will be allowed to enter GM property only for the purpose of transporting material and equipment which is too heavy or bulky to carry. Parking areas will be designated for contractor owned vehicles.
- 8.3 Contractor employee vehicles must be driven in a safe manner while on GM property. Contractor employee vehicles must be parked in the North East corner of the parking lot. Violator's vehicles will be towed at owner's expense.
- 8.2 All traffic control signs must be obeyed while on GM property.
- 8.3 A signal man must be used when a contractor's vehicle is transporting material and equipment through the plant.
- 8.4 Watch for trucks and cranes.

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- 8.5 Do not leave trucks or vehicles unattended in plant aisle-ways.
- 8.6 Vehicle safety devices must be maintained in working order.
- 8.7 Do not leave trucks or equipment running while unattended.
- 8.8 Trucks shall not be driven across electrical cords, air hoses, or oxy-acetylene hoses.
- 8.9 No trucks with propane tanks will be permitted on GM property.
- *8.10 *No E-Z Go Carts shall be used on plant property.*

9.0 Material handling.

- 9.1 No suspended load will ever be transported over or through a populated area unless that area has been vacated and properly barricaded.
- 9.2 Loads must not be left suspended and unattended.
- 9.3 Heavy loads, while being transported, must be kept as close to the ground/floor as possible.
- 9.4 When handling loads in confined or populated areas, the move must be accompanied by a spotter.
- 9.5 Free falling of overhead steel and equipment to be removed is prohibited.
- 9.6 No more than one day's worth of combustible building material shall be stored in any one location within the building at any time. All roofing materials, roof insulation, etc., must be stored outside the buildings in an appropriate manner.
- 9.7 Contractors shall not store any material or equipment within three (3) feet of the inside walls of the plant or within six (6) feet of the plant perimeter fence. Combustible material shall not be stored within 100 feet of outside walls and non-combustible material shall not be stored within 50 feet of outside walls.
- 9.8 Any contractor-supplied materials, which have been approved for shipment to the contractor at GMPT Bedford, will be handled as outlined in Plant



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Procedure 533-07, "Receiving and Unloading of Materials Bought by Outside Contractors and Shipped to GMPT". The project engineer granting approval will notify Security that on-site delivery is approved and will provide direction to Security for routing of the material.

- 9.9 When moving any single piece of equipment weighing over 40,000 lbs., or when the equipment must be raised 12" or more above its normal grade, the minimum conveyance requirement is a rubber tired lowboy trailer with a sufficient load rating. The same conveyance requirement holds true if the equipment weighs less than 40,000 lbs., but more than 20,000 lbs., when the equipment center of gravity is five (5) feet or more above its base.
- 10.0 Tools and equipment.
 - 10.1 All contractor tools and equipment must be kept in safe working order.
 - 10.2 GMPT Bedford personnel reserves the right to inspect all equipment, and to prohibit the use of any equipment judged to be unsafe.
 - 10.3 Powder cartridge driven tools must not be used for any job on GM property.
 - 10.4 Rope used for swinging staging must not be used for any other purpose.
 - 10.5 Scaffold planks must be OSHA compliant (wood cleated).
 - 10.6 Only fiberglass framed ladders will be permitted on GM property.
 - 10.7 All ladders must be equipped with safety feet.
 - 10.8 Ladders in aisleways or walkways must be protected by suitable signs, flashing lights, barricades or by an attendant.
 - 10.9 Contractor's ladders are to be plainly marked with the name of the company.
- 11.0 GMPT Bedford equipment, tools and utilities.
 - 11.1 Safety guards removed from the GMPT Bedford equipment while making repairs or alterations must be replaced at the completion of the job, and before the equipment is placed back in operation.



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- 11.2 The contractor must have specific approval from the GM plant engineer or GM maintenance superintendent before using any GM equipment.
- 11.3 If any GMPT Bedford utility must be cut off, or curtailed to perform necessary work, prior specific approval to do so must be obtained from the GM plant engineering department.
- 11.4 Any temporary utility must be approved by the GM plant engineering department.
- 11.5 Approval from GM plant security must be obtained before any alterations can be made to the plant fire suppression systems.
- 11.6 Authorized GM trades persons must be present for any contractor use of GMPT Bedford pendant push button controlled overhead traveling cranes.
- 12.0 Flammable liquids, explosives and hazardous materials.
 - 12.1 Gasoline, or any other flammable liquid cannot be brought onto GM property unless approved by the GM plant security fire captain. If approved, the material must be stored in containers as approved by the underwriters and bearing their seal of approval. Cans must be kept secure.
 - 12.2 Plant security will inspect all contractor equipment while on GM property, and remove all flammable liquids not kept in approved safety containers and in locations designated by plant security.
 - 12.3 Gasoline is not to be stored in the plant buildings at any time. Gasoline may be stored outside of the plant buildings, but must be kept at minimum of 75 feet away from any cutting or welding operations. Any container holding over 10 gallons of gasoline shall be considered bulk storage, and approval must be obtained from the GM plant security fire captain or the plant safety director before being allowed on the premises. Any container of 10 gallons or less shall be an approved safety can with flame arrest screens.
 - 12.4 All equipment is to be fueled outside of the plant building a minimum of 75 feet from open flames and cutting and welding operations. If it is absolutely necessary to fuel inside the plant buildings, an approved 5 gallon safety can,



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equipped with flame arrest screens is to be used. Plant security must be notified prior to refueling. The 5 gallon can must be removed to the outside storage when refueling of equipment is completed.

- 12.5 No explosives will be allowed on the premises without prior approval from the plant safety director. GMC Treasury Permit (Form 4708-Part 1) must be posted at locations where explosives are stored, also where their inventory records are maintained.
- 12.6 No tar kettles will be allowed within or upon any buildings.
- 12.7 The contractor is responsible for obtaining information on any potentially hazardous materials in the area where the work is being performed, as well as notifying all of his/her employees of these hazardous materials, if any.
- 12.8 The contractor must notify the GM project engineer of any hazardous materials that may be required for performing the work outlined in the contract. The contractor will then be required to obtain the Material Safety Data Sheets for each proposed product, and present that information (with the GM project engineer) at the bi-monthly GMPT Bedford – Hazardous Materials Control Committee meeting for approval. Submittals shall be on GM forms requiring full disclosure.



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13.0 Underground and pit areas.

- 13.1 GM plant engineering must be contacted before starting any excavation or dumping of heavy loads to assure that no underground service such as power cables, fire lines, etc., are in the area.
- 13.2 Pits or trenches which are open during digging, forming, pouring, and removal of equipment, will be barricaded with OSHA compliant railings and marked with "DANGER" signs while open. A barricade shall surround the entire work site area. Barricades are to be constructed of 1 1/2 inch diameter standard pipe. Area access openings shall have removable pipe lengths; whenever access barricades are down, a contractor employee must be stationed on guard.
- 13.3 All completed pits or trenches which have no covers must be barricaded with permanent steel pipe railing and posts.
- 13.4 In addition to being barricaded on all sides, all openings in the ground, inside or outside of the plant, shall be illuminated at night for the protection of GM employees.
- 13.5 In the case of drilling holes or breaking concrete, dust must be kept down by the use of wet burlap. Spraying the work area with water is also acceptable.

14.0 Overhead and under roof.

- 14.1 No work is to be done overhead or under roof unless specifically directed by the GM plant engineering department.
- 14.2 Any construction work done above the floor shall comply with Section 16.0 entitled "Barricades" and Section 7.0 entitled "Welding and Cutting Procedure".
- 14.3 Overhead scaffolding must be tied down.
- 14.4 No work is to be performed over personnel or any machinery that is in operation.
- 14.5 Do not leave materials or tools on overhead catwalks, platforms or on any other overhead structure upon completion the job.



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- 14.6 Inform department superintendent in advance of scheduled overhead work.
- 14.7 Fall protection equipment shall be supplied and utilized by the contractor when working more than 6 feet above the floor. See Section 20.
- 15.0 Roof areas.
 - 15.1 No work is to be done on the roof unless given specific permission and building construction specifications by the GM plant engineering department.
 - 15.2 Any construction work done on roof shall comply with Section 16.0 entitled "Barricades" and Section 7.0 entitled "Welding and Cutting Procedure".
 - 15.3 Rigging must be adequate for items moved or installed on roof.
 - 15.4 Clear and barricade the area under the roof where heavy objects requiring rigging are being moved. The contractor shall post a spotter to ensure that the area remains clear of personnel.
 - 15.5 Where objects can slide or blow off the roof, the contractor shall post sentries at ground level outside the building.
 - 15.6 Inform department superintendents in advance of scheduled overhead work.
 - 15.7 Any work within 6 feet of roof edges or openings shall require fall protection equipment and anchorage points. See Section 20.
- 16.0 Area isolation barricades - not including floor openings.
 - 16.1 Work site areas which require isolation, other than aisles or roadways, shall be entirely surrounded by barricades.
 - 16.2 Any construction project of a five (5) day duration or longer shall have an OSHA compliant barricade installed at a height of 42" above grade. See Item 13.2.

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- 16.3 Any construction project of less than a five (5) day duration shall have a GM plant engineering department approved barricade installed, consisting of safety tape or an equivalent.
- 16.4 When a contractor has barricaded an aisle or roadway, and leaves the area for any reason (lunch or end of shift), they shall install an operating electric flasher in the area. The contractor shall display the flasher on an adequate support, at a height of 42" above grade. The contractor shall provide the electric flashers.
- 16.5 When proper barricades are installed, any violation of these barricades by GM personnel must be reported by the contractor to GM plant security immediately.
- 16.6 No barricades will be removed without the prior approval of the GM plant engineering department.
- 17.0 Contractor certificates of insurance.
- 17.1 The contractor, and all sub-contractors, shall have a current certificate of insurance coverage on file with the GMPT Bedford Plant prior to commencement of work. **NOTE:** For clarification of any of these items, please contact the GM plant engineering department.
- 18.0 Spotting and checking of rail cars. (529-2)
- 18.1 Contractors shall comply with this procedure when involved with rail cars in the course of performing their work.
- 18.2 Contractor shall verify the "blue flag" and derail is in place prior to performing work on or about a rail siding or car.

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19.0 Arrival and exit time.

19.1 No vehicle traffic is allowed in or out of the main truck entrance, with the exception of medical personnel, within the following time periods:

Monday

6:15 - 6:45 a.m.
2:45 - 3:15 p.m.
10:45 - 11:00 p.m.
11:30 - 11:45 p.m.

Tuesday through Sunday

6:45 - 7:00 a.m.
7:30 - 7:45 a.m.
2:45 - 3:00 p.m.
3:30 - 3:45 p.m.
10:45 - 11:00 p.m.
11:30 - 11:45 p.m.

Additional times for Friday

12:00 - 12:15 a.m.
3:15 - 3:45 p.m.

19.2 The above times reflect shift changes for GM employees. For the safety of those employees entering and/or leaving the plant at these times, your cooperation is needed and very much appreciated.

20.0 Fall protection and fall prevention.

20.1 The purpose of this procedure is to set forth guidelines that must be adhered to in order to ensure employee safety when working on the roof, or at elevated positions inside the plant. This procedure covers all plant buildings, inside and out.

20.2 Whenever the performance of any task would allow a worker to fall a distance of six feet or more, or any distance where the likelihood of a serious or fatal injury exists, the fall hazards must be identified, evaluated and controlled based on the hierarchy of controls.



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20.3 Each contractor shall have a fall hazard program, and shall provide to GM management upon request.

21.0 Roof safety rules.

21.1 GM plant engineering shall be responsible for providing the plant specific GMPT Bedford "Roof Safety Training Course" to each contractor assigned to visit or work on the roof. In addition, the GM plant engineering department will show the contractors suspected unsafe roof areas in their work zone.

21.1.1 Roof work of a routine nature will be scheduled and performed during daylight hours only. Night work on the roof should be conducted only in emergency.

21.2 Access roof areas using stairways where available.

21.3 Walk on designated walkways only. Designated walkways are striped-off with yellow lines. If designated walkways are not visible due to snow build-up or unlighted night conditions, do not walk on that area of the roof.

21.3.1 If you must leave a designated walkway, 2" X 10" X 8' boards, 3/4" plywood (4' X 8') or aluminum walkboards must be used. Remove planking or walkboards from roof when job is complete.

21.3.2 Do not walk on Transite-covered pitched roofs.

21.4 Fall protection equipment must be worn when working around roof openings, within six (6) feet of the roof's edge or on suspected unsafe roof areas.

21.4.1 Proper fall protection consists of a full body harness, properly connected to an approved shock absorbing lanyard or device. The shock absorbing device must be connected to a structure capable of supporting a maximum arresting force (MAF) of 1800lbs.

21.4.2 Equipment involved in a fall must be taken out of service immediately. Any fall related incident must be reported to the GM project engineer and the GM safety supervisor.

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- 21.5 Transporting objects that are too heavy to carry should be transported on four-wheeled carts, and along the designated walkways. If the combined weight of the transported object and the cart exceeds 500 pounds, then the GM plant engineering department must be contacted to determine the safe route.
 - 21.5.1 Before setting objects on the roof with a crane or helicopter, GM plant engineering must determine that the set-down location will safely support the load.
 - 21.5.2 In cases where the transported load or set-down load exceeds 500 pounds, the plant area directly below the travel route must be properly barricaded and evacuated of personnel.
- 21.6 Never leave a roof opening unguarded. Standard OSHA guardrails are required.
- 21.7 Never leave unsecured material on the roof which could be blown off or fall off the roof, posing a hazard to the areas below.
- 21.8 Watch for low head clearance conditions when walking on the roof; (e.g. electrical cable trays, ductwork and guide wires, equipment platforms, fan intakes, etc.). **Hard hats are required to be worn at all times while on the roof.**
- 22.0 Suspended ceiling and mezzanine areas.
 - 22.1 Contractor personnel working around suspended ceilings must use extreme caution.
 - 22.1.1 The attached list and map numbers all plant suspended ceilings and mezzanine areas.
 - 22.1.2 Suspended false ceilings should never be walked on or traveled across.
 - 22.1.3 When in doubt, contact your supervisor.
 - 22.2 All mezzanine areas have a posted rated load capacity per square foot. When storing objects on mezzanine areas, do not exceed this capacity. Contact GM plant engineering if questions arise.

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23.0 Working in and around overhead structures inside the plant.

23.1 All contractor personnel must follow proper fall hazard safety procedures while performing overhead work (e.g. JLG lift, scissors lift, etc.).

23.2 It is permissible to leave a guarded work bucket or platform to enter a guarded catwalk or walkway on an overhead crane.

24.0 Equipment lockout / energy control.

24.1 When a contractor is assigned to perform a service, maintenance or construction task which potentially exposes him/her to hazardous energy, the exposure must be eliminated. If the exposure cannot be eliminated, the energy must be controlled through positive means (lockout, blocking, etc.)! General Motors does not recognize "tag-out" as an acceptable means of controlling hazardous energy!

24.1.1 Exposure is defined as being in a position to be injured by released energy.

24.1.2 Hazardous energy is defined as energy which could cause injury to the servicing employee if it was unexpectedly energized, released or used to start up the machine / equipment posing the exposure.

24.2 Contractors must provide a durable lockout device to each and every employee who has the potential to be exposed to hazardous energy.

24.3 Contractors must ensure that each and every employee who has the potential to be exposed to hazardous energy has been properly trained in the theory and methods pertaining to lockout / energy control.

24.4 When an exposure is identified, and cannot be eliminated, each source of hazardous energy must be controlled / locked out at its source by each and every exposed employee. This is to be accomplished by carefully following the equipment lockout placard.

24.4.1 Careful attention must be given to equipment and machines that have multiple energy sources, such as compressed air, electrical and/or

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hydraulic power.

24.4.2 An attempt to cycle the equipment following proper lockout / energy control procedures must be made to insure that the system is indeed de-energized.

24.4.3 A survey of adjacent equipment should be made to determine if its operation would subject the exposed employees to additional hazards.

24.5 If GM operations or utilities will be affected by contractor lockout / energy control procedures, the GM project engineer or designated GM representative must be notified.

24.6 Restoring equipment to service.

24.6.1 Check the equipment and the surrounding area to insure that nonessential servicing items have been removed.

24.6.2 Check the work area to insure that all employees have been safely positioned or removed from the area.

24.6.3 Verify that the controls are in a "neutral" position.

24.6.4 Remove the lockout / energy control devices and re-energize the equipment.

24.6.5 Notify the GM project manager or designated GM representative that the equipment has been restored to service.

25.0 Confined space entry.

25.1 A confined space is defined as any area that:

- ◆ Has limited or restricted means of entry or exit.
- ◆ Is large enough for a worker to enter and perform work.
- ◆ Is not designed for continuous employee occupancy.

25.2 Each area on GMPT Bedford property that meets the above stated criteria, has been placarded with a sign indicating that entry can only be made by obtaining a

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confined space permit.

- 25.3 If a contractor must enter to perform work in any of these areas, the GM project engineer, designated GM representative or GM safety supervisor must be contacted to discuss the local requirements of the GMPT Bedford Casting Plant Confined Space Entry Procedure (Safe Job Procedure 529-72) with the contractor prior to entry.

26.0 Presumed Asbestos Containing Material

- 26.1 If a contractor must demolish, remove, cut, burn, weld or disturb any presumed asbestos containing material (i.e. pipe insulation, transite roofing, asbestos containing floor or ceiling tile) in anyway, the plant environmental department and plant safety supervisor must be contacted in order to ensure that proper federal, state, local and plant safety procedures are followed.

27.0 Environmental.

- 27.1 All contractors and their personnel shall conform to and comply with all applicable environmental laws and regulations and requirements.
- 27.2 All contractors and their personnel shall understand and comply with the "Environmental Policy" of GMPT Bedford (See Attachment).
- 27.3 Each individual will be accountable for knowing the Four Points of the Environmental Policy.

ENVIRONMENTAL POLICY

As a responsible corporate citizen, GMPT Bedford is dedicated to protecting human health, natural resources and the local and global environment, in accordance with the Environmental Principles of General Motors Corporation. This dedication reaches further than compliance with the law to encompass the integration of sound environmental practices into our business decisions. This policy is based on the integration of risk-based, cost-effective management practices into site activities with the aim of continually improving environmental performance.

The site is committed to assess the environmental impacts of its activities and product to base its environmental management programs, and to reduce these impacts through the establishment of appropriate objectives and targets.

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In particular, GMPT Bedford, will strive to achieve the following objectives through continued execution of our Environmental Management System.

1. Comply with all applicable environmental laws and regulations, and other requirements.
2. Assign management responsibility for the environment in all areas of the facility and ensure that all employees are aware of their individual responsibilities for acting in accordance with this policy, while providing effective information and training to encourage individuals to contribute effectively.
3. Practice effective pollution prevention in accordance with a hierarchy giving top priority to waste prevention at the source, elimination or reduction of wasteful practices and recycling.
4. Periodically review and, if necessary, improve procedures to minimize the potential risks to the environment in the event of any abnormal situations.
5. Maintain good communications with our local community and cooperate with legislators, regulators and other organizations with an interest in our environmental performance.

In accordance with our Environmental Management System requirements, the site's objectives will be reviewed periodically to assess progress toward continuous improvement. This policy statement will be made available to all GMPT Bedford employees and the public.

Date: 02/20/98

John Thomas, Plant Manager



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ENVIRONMENTAL POLICY SUMMARY

1. OBEY THE LAWS.
2. REDUCE WASTE.
3. PREVENT POLLUTION.
4. CONTINUALLY IMPROVE.



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Reviser/Originator:

Kim Dobosenski

Approved by:

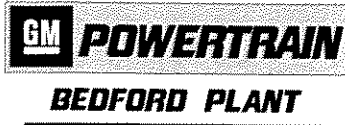
Tom Dillon 11-21-03
Department Head Date

Greg Smith 11-21-03
Safety Supervisor Date

Reviewed with:

Gary Hamilton 11-24-03
UAW H&S Representative Date

Brent Dalton 11-21-03
IBEW H&S Representative Date



Form 5523-12(A)
Issue Date: 2/28/98
Revision # 5
Revised Date: 09/12/03

Contractor Safety and Environmental Agreement

Contractor's: Name & Address

Phone:

Fax:

As the on-site supervisor or representative of the general contractor, prior to beginning any work on GMPT-Bedford premises I understand all contractors and subcontractors under my supervision must comply with the following safety and environmental requirements:

- ☐ 1. I have read and have shared with my employees relevant information in Procedure 5532-1 (Safety and Fire Specifications for Outside Contractors).
- ☐ 2. If supplied by my plant contact, I have read and understand all applicable Environmental Procedures relating to the project.
- ☐ 3. I understand and will run my project in accordance with the four points of the GMPT-Bedford Environmental Policy (Obey the Law, Reduce Waste, Prevent Pollution and Continually Improve).
- ☐ 4. I understand that I must disclose any chemical products that will be used as part of the job and receive plant approval prior to their use on-site.
- ☐ 5. If required, I have read and understand GM 1638 Construction General Conditions.
- ☐ 6. If performing any labeling or painting of plant piping systems, I have received and read a copy of Labeling and Painting of Piping Systems.
- ☐ 7. I know where the allocated parking facilities are located for contractor employees as well as the location of equipment storage areas, and shall comply with these requirements. (Refer to Procedure 5532-1)

I am associated with the following project(s):

Signed:

 Dated:

NOTE: This document is good for one year, if work activities remain consistent and the on-site supervisor, or representative of the general contractor, does not change.

APPENDIX D

BLANK JOB SAFETY ANALYSIS (JSA)



JOB SAFETY ANALYSIS (JSA)

Title



Field staff must review job-specific work plan and coordinate with project manager to verify that all up-front logistics are completed prior to starting work including, but not limited to, permitting, access agreements, and notification to required contacts (e.g., site managers, inspectors, clients, subcontractors, etc.). Additionally, a tailgate safety meeting must be performed and documented at the beginning of each workday. **Stop, Think, Act, Review (STAR)** must be used prior to any activity. All personnel must possess the appropriate training prior to initiating scheduled tasks. Also consider weather conditions. CRA personnel have the authority and responsibility to use **Stop Work Authority (SWA)**.

Date Issued/Revised:	[Date of review/revision]	JSA Type:	[Construction/Office Work/O&M/Drilling/Maintenance/Demolition/Decommissioning]
Work Type:	[Environmental/Remediation/Construction/General Industry]	Client:	
Work Activity:			
Work Site:	[Site information and address]		
Key Equipment:			
Task-specific Training:	[Identify any special/additional training necessary to safely complete this task]		

MINIMUM REQUIRED PERSONAL PROTECTIVE EQUIPMENT (see job steps for task-specific requirements)					
☐ Reflective Vest	☐ Goggles	☐ Gloves*	Supplied Air	APR	
☐ Hard Hat	☐ Face Shield*	☐ Coveralls*	☐ SCBA	☐ Full Face APR	☐ Particulate ☐ Organic Vapor
☐ Lifeline/Harness*	☐ Hearing Protection*	☐ PPE Clothing*	☐ Airline Respirator (attach description)	☐ Half Mask APR	☐ Particulate/Organic Vapor Combined
☐ Safety Glasses	☐ Safety-toed Boots				☐ Acid Gas
☐ Other*		☐ Other*		☐ Other*	
ADDITIONAL PPE (*provide specific type(s) or descriptions of this item below)					

Project Development Team		Position/Title	Modified By	Reviewed By	Position/Title	Date
Name	Signature					



JOB SAFETY ANALYSIS (JSA)

Title



Job Steps ⁽¹⁾	Task Activity	Potential Hazard(s) ⁽²⁾	Corrective Measure(s) ⁽³⁾	Person Responsible
1		•	•	
2		•	•	
3		•	•	

- (1) Each Job or Task consists of a set of steps. Be sure to list all the steps in the sequence that they are performed. Specify the equipment or other details to set the basis for the potential (associated) hazards.
- (2) A hazard is a potential danger. What can go wrong? How can someone get hurt? Consider, but do not limit, the analysis to: **Contact** - victim is struck by or strikes an object; **Caught** - victim is caught on, caught in or caught between objects; **Fall** - victim falls to ground or lower level (includes slips and trips); **Exertion** - excessive strain or stress/ergonomics/lifting techniques; **Exposure** - inhalation/skin hazards. Specify the hazards and do not limit the description to a single word such as "Caught".
- (3) Aligning with the Job Steps, Task Activity Description, and Potential Hazard columns, describe what actions or procedures are necessary to eliminate or minimize the hazards. Be clear, concise and specific. Use objective, observable, and quantified terms. Avoid subjective general statements such as "be careful" or "use as appropriate".

APPENDIX E

BLANK UTILITY TASK VEHICLE (UTV) CHECKLIST

PRE-DEPARTURE ATV AND UTILITY TASK VEHICLE (UTV) CHECKLIST

Operator:_____

Project Name & Number:_____

Location: (ie Area, parcel, etc.)_____

Today's Date:_____

Unit Number:_____

Inspection Checklist	Yes	No	Comments
Before starting, Check Engine Oil. If low level, add to the fill line indicated on the oil stick. Indicate how much oil was added. Use SAE 30 oil only.			
Before starting, Check engine Coolant reservior. If low, add to the fill line. Indicate how much in comment section.			
Before starting, Check Fuel/Gasoline (Fuel=Diesel, Gasoline=Unleaded). Check label on the tank.			
Check Tires. Pressure, excessive wear, valve stem cap, etc.			
Check Wheels (rims). Lug nuts, cracks or bends.			
Check Lights. (headlights and taillights).			
Check Brakes and Brake Fluid. Fill if necessary.			
Check Ignition Switch. Activate the Choke. Prepare to start			
Check Shifter controls. (2WD or 4WD) Operate in 2WD when on hard surfaces (ie. asphalt, concrete, gravel)			
Check Windshield for cracks, chips. Clean as needed.			
Check First Aid, Fire Extinguishers.			
Misc. Check complete condition of unit. Make sure cab of unit is clean of debris. Do not operate if there is missing, broken or damaged parts. Report to Supervisor.			

Signature:_____

APPENDIX F

ACCIDENT/INCIDENT REPORTING FORM

CONESTOGA-ROVERS & ASSOCIATES (CRA) INCIDENT REPORTING FORM

Incidents must be called into Incident Hot Line: 1-866-529-4886

Instructions: For Personal Injuries, Occupational Illnesses, and Property Damage, complete Sections 1 and 2.
For Vehicle Accidents, Complete Sections 1, 2, and 4. Initial report must be submitted within 24 hours.

SECTION 1

Report Status - Insert Date: (/ /) Initial Report (/ /) Update Report (/ /) Final Report (/ /) Verification/Validation				
A. Employee Identification () CRA Employee () Temporary Employee () Subcontractor				
Employee No.	Last Name	First Name	Middle Name/Initial	M or F
Area Code ()	Telephone Number	Address (Street, City, State, Province, Zip Code)		
Date of Hire / /	Position/Title	Supervisor	Employee's Company/Office Location	
B. General Information				
Where did the incident occur? () Office () Project Site () Other _____ () Canada () United States		Type of Loss (Check all that apply) () Employee Injury/Illness () Vehicle Accident () Property Damage Only		
Address of Near Loss (City, State, Providence, Zip Code)		Specific Location of Near Loss (e.g., where on site)		
Date and Hour of Loss Month Day Year a.m. p.m.		Date and Hour Reported to Employer Month Day Year a.m. p.m.		Date and Hour Last Worked Month Day Year a.m. p.m.
Normal Work Hours on Last Day Worked From: a.m. p.m. To: a.m. p.m.		Witnesses? () Yes () No Witness Name and Telephone Number		
C. Project Information (Project Related Loss Only) Project Related: () Yes () No				
Project #	Project Name	Project Manager	Site Telephone Number ()	Project Manager Cell Number ()
Was the Client Advised of the Loss? () Yes () No		Name	Date & Time	

SECTION 2

A. Details of the Loss	
1. What job/task was being performed when the incident occurred? (Example: collecting groundwater samples).	
2. Provide a detailed description of the employee's specific activities at the time of the accident. Include details of equipment/materials being used, including the size and weights of objects being handled. If necessary, attach additional pages to the report.	
3. For injuries, identify the specific part of body injured, and specify left or right side. For illnesses, identify and describe the affected area/body part.	
4. Identify the object or substance that directly injured employee and how. Include size and weight of object, quantity of substance, etc.	
5. Identify property damaged and how it was damaged (include owner of property, nature and source of damage, model and serial number, if appropriate).	
B. Health Care/Medical Treatment	
Employee received health care? () Yes () No	Identify the type of health care provided and where it was performed. (Check all that apply). () First Aid () Medical treatment other than first aid (sutures, etc.) () Hospitalized () Clinic () Hospital emergency room () On location by self or CRA employee () On site by EMT
Name of Health Care Provider, Physician's Name, Address (Street, City, Province/State, and Postal/Zip Code)	
C. Loss Investigation () 5 Why Root Cause Analysis Investigation [Non-OSHA Recordable, <\$1,000 damage] () Tap Root Root Cause Analysis [OSHA Recordable, and/or >\$1,000 damages]	
HASP prepared? () Yes () No () Not applicable Submit a PDF of HASP and relevant JSA(s) to Investigation Team. If yes, what the HASP on-site? () Yes () No	Did the safety plan identify and provide safety procedures for the specific tasks the employee was conducting when injured? () Yes () No If no, why not? (Explain) _____ Did the employee utilize the STAR process before initiating the task? () Yes () No If no, why not? (Explain) _____ Was the employee post incident drug & alcohol tested () Yes () No

XXXXX (X)

SECTION 2 (Continued)

5 Why Root Cause:		
1. Why did "above" happen?	Verification	
2. Why did "1" happen?		
3. Why did "2" happen?		
4. Why did "3" happen?		
5. Why did "4" happen?		
6. Why did "5" happen?		
Additional information: Attach photos, witness statement(s), affected employee statement, diagrams, as applicable, to the end of this document.		
See the Causative Factors & Corrective Actions		
D. Accountability		
Initial Report Date Month Day Year	Initial Report Prepared by: (please print)	Initial Report Prepared by: (signature)
Investigation Team	Company	Position/Title
Final Report Date Month Day Year	Final Report Prepared by: (please print)	Final Report Prepared by: (signature)
E. Stewardship		
Will an Incident Summary be Prepared () Yes () No By:	Disciplinary Action Taken? () Yes () No	
Quality Review By:	Date:	Findings:

*Fax Completed Form to CRA's Incident Reporting Fax: (832) 485-5222
Send Original to CRA's Incident Reporting Department, Houston, Texas*

SECTION 3

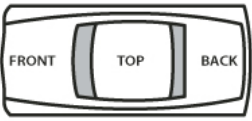
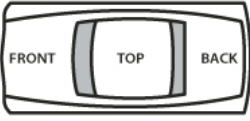
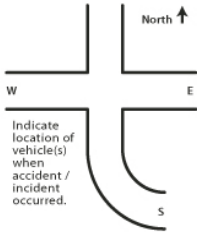
D. Agency Reporting and Recording Information (To be completed by the Regional Safety and Health Manager)			
CANADA			
Form 7 Sent to WSIB? () Yes () Not required	Employee Injury Information (Injury met the following criteria) () First Aid () Medical Treatment () Critical Injury () Modified Duty () Lost Time Injury If medical treatment, what?		
Joint Safety and Health Committee Notified? () Yes () No	Total days of modified duty If exceeds 7 days, report to WSIB.	Total days of lost time (if any)	Date employee returned to work Month Day Year
UNITED STATES			
OSHA Recordable Injury? () Yes () No	Employee Injury Information (Injury met the following OSHA 300 Log criteria) () First Aid () Medical Treatment () Restricted Duty () Lost Time Injury If medical treatment, what?		
Total days of restricted duty	Total days of lost time (if any)		Date employee returned to work Month Day Year

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XXXXX (X)

VEHICLE ACCIDENT SECTION
(Complete this Section for all Vehicle Accidents)

SECTION 4

A. CRA Vehicle					
License Plate No.		State/Province		Police Department	City State/Province
Vehicle Year/Make/Model		Odometer Reading at Time of Accident		Police Report Number	Weather Conditions
Name of Person Operating Vehicle			"X" IN AREA OF VEHICLE DAMAGE  CIRCLE 0 No Damage 1 Light 2 Moderate 3 Heavy 4 Rolled 5 Burned		
Address					
City	State/Province	Zip Code			
Telephone: Area Code ()					
Vehicle Type: () Personal () Rental () CRA-Own					
Description of Vehicle Damage:					
B. Other Vehicles Involved					
Name of Owner		Address		City/State/Prov./Zip	
				Area Code and Telephone Number ()	
Operator's Name (if different from above)		Address		City/State/Prov./Zip	
				Area Code and Telephone Number ()	
Year/Make/Model	Description of Property Damage:			"x" IN AREA OF VEHICLE DAMAGE  CIRCLE 0 No Damage 1 Light 2 Moderate 3 Heavy 4 Rolled 5 Burned	
Insurance Co. Name & Telephone					
License Plate No./State/Province					
C. Injured Persons					
Name	Address Street, City, State/Prov./Zip Code		Phone Number	Nature of Injury	Indicate if Injured was a Vehicle Driver/ Passenger, CRA Employee, Other, or Pedestrian
1.					
2.					
3.					
D. Witnesses					
Name		Address Street, City, State/Prov./Zip Code			Area Code and Telephone Number
1.					()
2.					()
E. Description of Accident					
PLEASE COMPLETE OR ATTACH SEPARATE DIAGRAM 					
		Was Ticket Issued: Reason: _____ Other Operator ☐ CRA Operator ☐			
Report Date Month Day Year		Report Prepared by: (please print)		Report Prepared by: (signature)	

Note: If Additional Space is Required to Complete this Report, Use Separate Sheet of Paper and Attach.

Fax Completed Form to CRA's Incident Reporting Fax: (832) 485-5222
Send Original to CRA's Incident Reporting Department, Houston, Texas

XXXXX (X)

