

N60200.AR.004970
NAS CECIL FIELD, FL
5090.3a

SITE SPECIFIC HEALTH AND SAFETY PLAN FOR LONG TERM MONITORING AND
OPERATION AND MAINTENANCE OPERATIONS AT BUILDING 46 AND DAY TANK 1 NAS
CECIL FIELD FL
2/1/2008
SOLUTIONS-IES INC

**Site Specific
Health and Safety Plan**

**Long-Term Monitoring and
O&M Operations
At Building 46 and Day Tank 1**

**Naval Air Station Cecil Field
Jacksonville, Florida**

**Contract No. N62467-05-G-0193
Contract Task Order No. 0001**

**Submitted to:
NAVFAC Southeast**

**Prepared by:
Solutions-IES, Inc.
1101 Nowell Rd.
Raleigh, NC 27607**

February 2008



Table of Contents

1.0	HASP PURPOSE AND PREPARATION	1
2.0	PROJECT INFORMATION AND DESCRIPTION.....	2
3.0	INTRODUCTION.....	3
4.0	PROJECT ORGANIZATION AND TASKS TO BE PERFORMED	
	UNDER THIS PLAN.....	4
4.1	PROJECT ORGANIZATION.....	4
4.2	DESCRIPTION OF TASKS	4
	4.2.1 HAZWOPER-REGULATED TASKS	4
	4.2.2 NON-HAZWOPER-REGULATED TASKS.....	4
	4.2.3 HAZARD CONTROLS.....	5
5.0	HAZARD EVALUATION AND CONTROL	11
5.1	HEAT AND COLD STRESS	11
	5.1.1 PREVENTING HEAT STRESS.....	11
	5.1.2 SYMPTOMS AND TREATMENT OF HEAT STRESS	12
	5.1.3 HEAT-STRESS MONITORING	12
	5.1.4 PREVENTING COLD STRESS	13
	5.1.5 SYMPTOMS AND TREATMENT OF COLD STRESS	13
	5.2 BIOLOGICAL HAZARDS AND CONTROLS.....	14
	5.3 TICK BITES	14
	5.4 HAZARDS POSED BY CHEMICALS BROUGHT ON THE SITE.....	15
	5.4.1 HAZARD COMMUNICATION	15
	5.5 CONTAMINANTS OF CONCERN	15
	5.6 POTENTIAL ROUTES OF EXPOSURE	16
6.0	PERSONNEL	16
6.1	SOLUTIONS-IES EMPLOYEE MEDICAL SURVEILLANCE.....	
	AND TRAINING	16
6.2	FIELD TEAM CHAIN OF COMMAND AND.....	
	COMMUNICATION PROCEDURES	16
	6.2.1 CLIENT – NAVFAC SOUTHEAST	16
	6.2.2 SOLUTIONS-IES	17
	6.2.3 SUBCONTRACTORS.....	17
7.0	PERSONAL PROTECTIVE EQUIPMENT	18
7.1	SELECTION OF PPE	18
7.2	PPE SPECIFICATIONS.....	18
	7.2.1 UPGRADING OR DOWNGRADING LEVEL OF PROTECTION.....	18
8.0	AIR MONITORING.....	19
9.0	DECONTAMINATION.....	19
	9.1 DECONTAMINATION SPECIFICATIONS	19
	9.2 DIAGRAM OF PERSONNEL-DECONTAMINATION LINE	20
10.0	SITE CONTROL PLAN	22
	10.1 SITE CONTROL PROCEDURES.....	22
11.0	EMERGENCY RESPONSE PLAN	23
	11.1 PRE-EMERGENCY PLANNING	23
	11.2 EMERGENCY EQUIPMENT AND SUPPLIES.....	23
	11.3 EMERGENCY MEDICAL TREATMENT	24
	11.4 NON-EMERGENCY PROCEDURES	24

11.5	INCIDENT RESPONSE	25
11.6	EVACUATION	25
11.7	EVACUATION ROUTES AND ASSEMBLY POINTS	25
11.8	EVACUATION SIGNALS.....	26
11.9	EMERGENCY RESPONSE TELEPHONE NUMBERS	26
11.10	GOVERNMENT AGENCIES INVOLVED IN PROJECT.....	28
11.11	EMERGENCY CONTACTS.....	28
12.0	DISTRIBUTION.....	28

Attachments

1	Employee Signoff
2	Project-Specific Chemical Product Hazard Communication Form
3	Chemical-Specific Training Form
4	Material Safety Data Sheets
5	Project Self-Assessment Checklist

Figures

7-1	Personnel Decontamination Line	7-2
11-1	Hospital Location Map	11-2

Tables

2-1	Non-HAZWOPER Related Tasks.....	2-2
2-2	Activity Hazard Analysis.....	2-8
2-3	Equipment Inspection and Training Requirements.....	2-22
3-1	Symptoms and Treatment of Heat Stress.....	3-2
3-2	Symptoms and Treatment of Cold Stress.....	3-3
3-3	General Physical (Safety) Hazards and Controls	3-4
3-4	Chemical Hazards	3-6
3-5	Contaminants of Concern	3-8
4-1	Project Personnel Safety Certifications.....	4-1
5-1	PPE Specifications	5-1
6-1	Air Monitoring Specifications	6-1
6-2	Calibration Specifications	6-2
7-1	Decontamination Specifications	7-1
11-1	Emergency Equipment.....	11-2
11-2	Evacuation Signals.....	11-4
11-3	Emergency Response Telephone Numbers.....	11-4
11-4	Emergency Contacts	11-5
13-1	Distribution List.....	13-1

Acronyms

°F	degrees Fahrenheit
ALARA	as low as reasonably achievable
APR	air-purifying respirator
CNS	central nervous system
CPR	cardiopulmonary resuscitation
CTO	Contract Task Order
dBA	decibel A-rated
DOT	Department of Transportation
FA	first aid
FID	flame ionization detector
GFCI	ground fault circuit interrupter
HAZCOM	hazard communication
HR	heart rate
HSM	Health and Safety Manager
HSP	Health and Safety Plan
IDLH	immediately dangerous to life and health
IDW	investigation-derived waste
JAX	Jacksonville
lb	pound
LEL	lower explosive limit
mg/m ³	milligrams per cubic meter
MSDS	Material Safety Data Sheet
mW/cm ²	milliwatt per square centimeter
NAS	Naval Air Station
NDG	nuclear density gauge
NSC	National Safety Council
OSHA	Occupational Safety and Health Administration
PAPR	powered air-purifying respirator
PDF	personal flotation device
PID	photoionization detector
PPE	personal protective equipment
ppm	parts per million
RMSF	Rocky Mountain Spotted Fever
SAR	supplied-air respirator
SCBA	self-contained breathing apparatus
SSO	Site Safety Officer
SOP	standard of practice
STEL	short-term exposure limit
SZ	support zone
TBD	to be determined
TMCC	truck-mounted crash cushion
TSDF	treatment, storage, and disposal facility

1.0 HASP PURPOSE AND PREPARATION

Requirements set forth in 29 CFR 1910.120, Hazardous Waste Operations and Emergency Response and the Solutions-IES Health and Safety Program were used in the development of this site-specific Health and Safety Plan (HASP). The purposes of this HASP are to assign responsibilities, establish personnel protection standards, specify safe operating procedures, and provide for contingencies that may arise during this project. New activities, changes to the scope of work, and new technical information will be incorporated into the HASP as field activities progress. The Solutions-IES site safety officer (SSO) or alternate SSO has the responsibility and authority to revise and carry out this HASP and verify compliance. Site personnel will be required to sign Attachment 1 each day after the health and safety meeting, and comply with the information contained within for the extent of their time onsite.

Reviewed by: Carrie A. Ruhlman
Project Manager

Date

Reviewed by: Walter J. Beckwith, P.G.
Solutions-IES Corporate Health and Safety Officer

Date

2.0 PROJECT INFORMATION AND DESCRIPTION

Client or Owner: NAVFAC Southeast

Contract No: N62467-05-G-0193

Solutions-IES Project Manager: Carrie A. Ruhlman

Office: Raleigh, North Carolina

Site Name: NAS Cecil Field

Site Address: Jacksonville, Florida

Date Health and Safety Plan Prepared: February 2008

Site Access: Site access is through the main entrance off 103rd Street.

Site Size: The former NAS Cecil Field occupies over 30,000 acres including areas on both sides of 103rd Street. The Building 46 and Day Tank 1 sites occupy less than 1,000 square feet.

Site Topography: Relatively flat

Prevailing Weather: Hot, humid summers with a chance of hurricanes. Mild winters with chance of temperatures below freezing.

Site Description and History: The facility was released by the Navy under the Base Realignment Commission (BRAC) closing effective September 30, 1999. The base area was turned over to the City of Jacksonville and is called the Cecil Commercial Center. The two sites contained storage tanks for diesel fuel and gasoline.

3.0 INTRODUCTION

This HASP has been prepared by Solutions-IES on behalf of Naval Facilities Engineering Command, Southeast. The HASP is intended to supplement Solutions-IES' corporate procedures and training, and is in accordance with the "Safety Requirements" paragraph of the BOA and the Unified Facilities Guide Specification, Division 1, Section 01525, Safety and Occupational Health Requirements.

This HASP presents the organization and responsibilities of the Solutions-IES field team, site control, hazard evaluation, monitoring equipment, personnel protective equipment, communication procedures, decontamination procedures, and emergency planning for use while performing activities to support the long-term monitoring (LTM) of groundwater at Day Tank 1 and Building 46, and operation and maintenance (O&M) oversight of existing air sparge (AS) systems at Building 46. All activities will take place at the former Naval Air Station (NAS) Cecil Field.

Relevant background information and the objectives of the HASP for these activities are summarized below. The objective of this plan is to provide for establishing safe working conditions at the site. The safety organization, procedures, and protective equipment have been established based on an analysis of potential physical, chemical, and biological hazards. Specific hazard control methodologies have been evaluated and selected to minimize the potential of accident or injury.

Groundwater Sampling & Data Collection

Once the Contracting Officer has issued a fieldwork NTP, field activities will be initiated in accordance with the approved Work Plan and HASP for each site. The work for both Building 46 and Day Tank 1 will be performed in accordance with the Work Plan. At the present time the approved field work consists of well purging and sampling. The RFP and proposal included the possibility of well abandonment and/or new monitoring well construction. These tasks will be added as an amendment(s) to this HASP at the time that the work is authorized.

Policy

The policy of Solutions-IES is to provide a safe and healthful work environment for all employees. Solutions-IES will take every reasonable step to eliminate or control hazards in order to minimize the possibility of injury, illness, or accident.

4.0 PROJECT ORGANIZATION AND TASKS TO BE PERFORMED UNDER THIS PLAN

4.1 PROJECT ORGANIZATION

Client: NAVFAC Southeast

Solutions-IES: Carrie A. Ruhlman, Project Manager

Contractors and Subcontractors

4.2 DESCRIPTION OF TASKS

Refer to project documents (i.e., work plan) for detailed task information. A health and safety risk analysis has been performed for each task and is incorporated in this HASP through task-specific hazard controls and requirements for monitoring and protection (Table 2-2). Tasks in addition to those listed below require an approved amendment to this plan before additional work begins.

4.2.1 HAZWOPER-Regulated Tasks

HAZWOPER-regulated tasks include:

- Monthly inspections of Building 46 Air Sparge System.
- Groundwater sampling at Building 46 and Day Tank 1.
- Monthly data collection at Air Sparge System.

4.2.2 Non-HAZWOPER-Regulated Tasks

Under specific circumstances, the training and medical monitoring requirements of federal or state HAZWOPER regulations are not applicable. It must be demonstrated that the tasks can be performed without the possibility of exposure in order to use non-HAZWOPER-trained personnel. **No non-HAZWOPER tasks are currently anticipated for this site.**

4.2.3 Hazard Controls

This section provides safe work practices and control measures used to reduce or eliminate potential hazards. Table 2-2 is an Activity Hazard Analysis that lists safe work practices and control measures used to reduce or eliminate potential hazards for the activities associated with this project. Inspection and training requirements for equipment are listed in Table 2-3. These practices and controls are to be implemented by Solutions-IES. Solutions-IES employees and subcontractors must remain aware of the hazards affecting them regardless of the party responsible for controlling the hazards. Solutions-IES employees and subcontractors who do not understand any of these provisions should contact the SSO for clarification.

In addition to controls specified in this section, an activity Self-Assessment Checklist is provided in Attachment 5. This checklist is to be used to assess the adequacy of Solutions-IES and its subcontractor's site-specific safety requirements. Objective of the self-assessment process is to identify gaps in project safety performance, and prompt for corrective actions in addressing gaps. A Self-Assessment Checklist will be completed after each sampling event and returned to the Project Manager for evaluation.

TABLE 2-2
Activity Hazard Analysis

Principal Steps	Potential Safety/Health Hazards	Recommended Controls
General Hazards	Reduce general safety hazards found at most sites.	<ul style="list-style-type: none"> • Site work will be performed during daylight hours whenever possible. Work conducted during hours of darkness will require enough illumination intensity to read a newspaper without difficulty. • Hearing protection worn in areas where you need to shout to hear someone within 3 feet. • Good housekeeping must be maintained at all times in project work areas. • Common paths of travel established and kept free from accumulation of materials. • Provide slip-resistant surfaces, ropes, and /or other devices to be used. • Specific areas should be designated for the proper storage of materials. • Tools, equipment, materials, and supplies will be stored in an orderly manner. • As work progresses, scrap and unessential materials must be neatly stored or removed from the work area. • Containers should be provided for collecting trash and other debris and will be removed at regular intervals. • Spills will be cleaned up. Oil and grease will be cleaned from walking/working surfaces.

Principal Steps	Potential Safety/Health Hazards	Recommended Controls
Hazard Communication	Comply with the Hazard Communication Standard informing workers about the chemicals to which they may be exposed; reference 29 CFR 1926	<ul style="list-style-type: none"> • Complete an inventory of chemicals brought on site by Solutions-IES or subcontractors using the Project-Specific Chemical Hazard Communication Form provided in Attachment 2. • Confirm inventory of chemicals brought on site by Solutions-IES subcontractors is available. • Confirm locations of Material Safety Data Sheets (MSDSs) from client, contractors, and subcontractors for chemicals to which Solutions-IES employees potentially are exposed. • Before or as the chemicals arrive onsite, obtain an MSDS for each hazardous chemical. • Label chemical containers with the identity of the chemical and with hazard warnings, and store properly. • Give employees required chemical-specific HAZCOM training using the Chemical-Specific Tracking Form provided in Attachment 3.
Hydrocarbon Fuels containing Benzene, Building 46	Exposure to Benzene above the PEL as listed in 29 CFR 1926.1128; reference standard 29 CFR 1910.1028	<ul style="list-style-type: none"> • Do not enter regulated work areas unless training, medical monitoring, and PPE requirements established by the competent person have been met. • Do not eat, drink, smoke, chew tobacco or gum, or apply cosmetics in regulated areas. • Skin absorption is a potential route of benzene exposure. • Benzene is considered a “Confirmed Human Carcinogen.” • A short term exposure limit (STEL) of 15 minutes exists for this material. • Benzene has an aromatic odor. • Respiratory protection and other exposure controls selection will be based on the most recent exposure monitoring results obtained from the competent person.

Energized Electrical	Reduce the hazards when dealing with energized electrical circuits; reference in 29 CFR 1926.400	<ul style="list-style-type: none"> • Only qualified personnel permitted to work on unprotected energized electrical systems. • Electrical wiring and equipment will be de-energized prior to conducting work unless it can be demonstrated that de-energizing introduces additional or increased hazards or is unfeasible due to equipment design or operational limitations. • Electrical systems will be considered energized until lockout/tagout procedures are implemented. • The Energized Electrical Work permit provided in Attachment 4 of this plan must be completed prior to working on unprotected energized electrical systems. • Follow control measures & procedures identified on Energized Electrical Work permit.
Fire Protection	To reduce the incidents of fires and provide resources to fight fires; reference in 29 CFR 1926.150	<ul style="list-style-type: none"> • Fire extinguishers will be provided so travel distance from any work area to the nearest extinguisher is less than 100 feet. When 5 gallons or more of a flammable or combustible liquid is being used, an extinguisher must be within 50 feet. Extinguishers must: 1) be maintained in a fully charged and operable condition, 2) be visually inspected each month, and 3) undergo a maintenance check each year. • The area in front of extinguishers must be kept clear. • Combustible materials stored outside should be at least 10 feet from any building. • Solvent waste and oily rags must be kept in a fire resistant, covered container until removed from the site. • Flammable/combustible liquids must be kept in approved containers, and must be stored in an approved storage cabinet.

Lockout/Tagout	Reduce the hazards of machine startups while out of service as referenced in 29 CFR 1910.147, 29 CFR 1926. 417	<ul style="list-style-type: none"> • Do not work on equipment when the unexpected operation could result in injury, unless lockout/tagout procedures are implemented. • Project-specific training may be required on site-specific lockout/tagout procedures. • Standard lockout/tagout procedures include the following six steps: • Notify all personnel in the affected area of the lockout/tagout, • Shut down the equipment using normal operating controls, • Isolate all energy sources, • Apply individual lock and tag to each energy isolating device, • Relieve or restrain all potentially hazardous stored or residual energy, and • Verify that isolation and de-energization of the equipment has been accomplished. Once verified that the equipment is at the zero energy state, work may begin. • All safe guards must be put back in place, all affected personnel notified that lockout/tagout has been removed, and controls positioned in the safe mode prior to lockout/tagout removal. • Do not remove another person's lock or tag.
Manual Lifting	Reduce hazards encountered when lifting loads	<ul style="list-style-type: none"> • Proper lifting techniques must be used when lifting any object. • Plan storage and staging to minimize lifting or carrying distances. • Split heavy loads into smaller loads. • Use mechanical lifting aids whenever possible. • Have someone assist with the lift especially for heavy or awkward loads. • Ensure that the path of travel is clear prior to the lift.

Noise	Reduce the exposure to noise as referenced by 29 CFR 1926.101 and 29CFR 1910.95	<ul style="list-style-type: none"> • Noise areas will be evaluated at the start of the project and at any time new machinery is added to the process. • Hearing protection will be worn whenever levels in excess of 85 dBA are exceeded as in areas where you must raise your voice to communicate at a distance of 3 feet or less. • Personnel will be trained in the proper installation techniques for ear protection that fits in the ear canal. • Hearing protective devices will be kept clean and sanitary between uses.
Traffic Control	Reduce hazards related to control of traffic and impacts	<ul style="list-style-type: none"> • Exercise caution when exiting traveled way or parking along street; avoid sudden stops, use flashers, etc. • Park in a manner that will allow for safe exit from vehicle, and where practicable, park vehicle so that it can serve as a barrier. • All staff working adjacent to traveled way or within work area must wear reflective/high-visibility safety vests. • Eye protection should be worn to protect from flying debris. • Remain aware of factors that influence traffic related hazards and required controls – sun glare, rain, wind, flash flooding, limited sight-distance, hills, curves, guardrails, width of shoulder (i.e., breakdown lane), etc. • Always remain aware of an escape route – behind an established barrier, parked vehicle, guardrail, etc. • Always pay attention to moving traffic – never assume drivers are looking out for you • Work as far from traveled way as possible to avoid creating confusion for drivers. • When workers must face away from traffic, a “buddy system” should be used, where one worker is looking towards traffic. • Work area should be protected by a physical barrier such as a K-rail or Jersey barrier.

5.0 HAZARD EVALUATION AND CONTROL

5.1 HEAT AND COLD STRESS

5.1.1 Preventing Heat Stress

The following suggestions relate to heat stress prevention:

- Drink 16 ounces of water before beginning work, such as in the morning or after lunch. Disposable (e.g., 4-ounce) cups and water maintained at 50 to 60 degrees Fahrenheit (°F) should be available. Under severe conditions, drink one to two cups every 20 minutes, for a total of 1 to 2 gallons per day. Take regular breaks in a cool, preferably air-conditioned, area. Do not use alcohol in place of water or other nonalcoholic fluids. Decrease your intake of coffee and caffeinated soft drinks during working hours. Monitor for signs of heat stress.
- Acclimate to site work conditions by slowly increasing workloads; e.g., do not begin site work with extremely demanding activities.
- Use cooling devices, such as cooling vests, to aid natural body ventilation. The devices add weight, so their use should be balanced against efficiency.
- Use mobile showers or hose-down facilities to reduce body temperature and cool protective clothing.
- During hot weather, conduct field activities in the early morning or evening if possible.
- Provide adequate shelter to protect personnel against radiant heat (sun, flames, hot metal), which can decrease physical efficiency and increase the probability of heat stress.
- In hot weather, rotate shifts of workers.
- Maintain good hygiene standards by frequently changing clothing and by showering. Clothing should be permitted to dry during rest periods. Persons who notice skin problems should consult medical personnel.

5.1.2 Symptoms and Treatment of Heat Stress

The symptoms of heat stress are listed in Table 3-1.

TABLE 3-1 Symptoms and Treatment of Heat Stress					
	Heat Syncope	Heat Rash (<i>miliaria rubra</i>, "prickly heat")	Heat Cramps	Heat Exhaustion	Heat Stroke
Signs and Symptoms	Sluggishness or fainting while standing erect or immobile in heat.	Profuse tiny raised red blister-like vesicles on affected areas, along with prickling sensations during heat exposure.	Painful spasms (cramps) in muscles used during work (arms, legs, or abdomen); onset during or after work hours.	Fatigue, nausea, headache, giddiness; skin clammy and moist; complexion pale, muddy, or flushed; may faint on standing; rapid thready pulse and low blood pressure; oral temperature normal or low	Red, hot, dry skin; dizziness; confusion; rapid breathing and pulse; high oral temperature.
Treatment	Remove to cooler area. Rest lying down. Increase fluid intake. Recovery usually is prompt and complete.	Use mild drying lotions and powders, and keep skin clean for drying skin and preventing infection.	Remove to cooler area. Rest lying down. Increase fluid intake.	Remove to cooler area. Rest lying down, with head in low position. Administer fluids by mouth. Seek medical attention.	Cool rapidly by soaking in cool—but not cold—water. Call ambulance, and get medical attention immediately!

5.1.3 Heat-Stress Monitoring

For field activities part of ongoing site work activities in hot weather, the following procedures should be used to monitor the body's physiological response to heat and to estimate the work-cycle/rest-cycle when workers are performing moderate levels of work. These procedures should be considered when the ambient air temperature exceeds 70°F, the relative humidity is high (greater than 50 percent), or when the workers exhibit symptoms of heat stress.

The heart rate (HR) should be measured by the radial pulse for 30 seconds, as early as possible in the resting period. The HR at the beginning of the rest period should not exceed 110 beats per minute or 20 beats per minute above resting pulse. If the HR is higher, the next work period should be shortened by 33 percent, while the length of the rest period stays the same. If the pulse rate still exceeds 110 beats per minute at the beginning of the next rest period, the following work cycle should be further shortened by 33 percent. The procedure is continued until the rate is maintained below 110 beats per minute or 20 beats per minute above resting pulse.

5.1.4 Preventing Cold Stress

Working in cold environments can also be dangerous. Prolonged exposure to freezing or cold temperatures can result in health problems such as trench foot, frost bite and hypothermia. When the body is unable to warm itself, serious cold-related illnesses and injuries may occur, and permanent tissue damage and death can occur. To help protect workers in cold environments:

- Learn the signs and symptoms of cold-induced illnesses/injuries and what to do to help workers.
- Train workers about cold-induced injuries and illnesses.
- Encourage workers to wear proper clothing for cold, wet, and windy conditions. Layer clothing to adjust to changing environmental temperatures. Wear a hat and gloves, in addition to underwear that will keep water away from the skin (polypropylene).
- Be sure that workers take frequent short breaks in warm dry shelters to allow the body to warm up.
- Try to schedule work for the warmest part of the day.
- Drink warm, sweet beverages (sugar water, sports drinks) and avoid drinks with caffeine (coffee, tea, sodas, or hot chocolate) or alcohol.
- Eat warm, high-calorie foods such as hot pasta dishes.

5.1.5 Symptoms and Treatment of Cold Stress

The symptoms and treatment of cold stress are listed in Table 3-2.

TABLE 3-2 Symptoms and Treatment of Cold Stress			
	Immersion (Trench) Foot	Frostbite	Hypothermia
Signs and Symptoms	Feet discolored and painful; infection and swelling present.	Pale, waxy-white skin color; skin becomes hard and numb; usually affects the fingers, hands, toes, feet, ears, and nose.	Normal body temperature drops below 95°F; fatigue or drowsiness; uncontrolled shivering; cool bluish skin; slurred speech; clumsy movements; irritable; irrational or confused behavior.
Treatment	Seek medical treatment immediately.	Move person to a warm dry area; remove wet or tight clothing; do not rub the affected area; gently place the affected area in a warm water bath and monitor the water temperature to slowly warm the tissue; when normal feeling, movement, and skin color have returned, dry and wrap the affected area; seek medical attention as soon as possible.	Call for emergency help; move person to a warm dry area; remove any wet clothing and replace with warm, dry clothing or wrap person in blankets; have person drink warm, sweet drinks; avoid caffeine; have person move their arms and legs.

5.2 BIOLOGICAL HAZARDS AND CONTROLS

Biological hazards and controls are listed in Table 3-3.

TABLE 3-3 Biological Hazards and Controls	
Hazard and Location	Control Measures
Snakes typically are found in underbrush and tall grassy areas.	If you encounter a snake, stay calm and look around; there may be other snakes. Turn around and walk away on the same path you used to approach the area. If a person is bitten by a snake, wash and immobilize the injured area, keeping it lower than the heart if possible. Seek medical attention immediately. DO NOT apply ice, cut the wound, or apply a tourniquet. Carry the victim or have him/her walk slowly if the victim must be moved. Try to identify the type of snake: note color, size, patterns, and markings.
Poison ivy, poison oak, and poison sumac typically are found in brush or wooded areas. They are more commonly found in moist areas or along the edges of wooded areas.	Become familiar with the identity of these plants. Wear protective clothing that covers exposed skin and clothes. Avoid contact with plants and the outside of protective clothing. If skin contacts a plant, wash the area with soap and water immediately. If the reaction is severe or worsens, seek medical attention.
Exposure to bloodborne pathogens may occur when rendering first aid or CPR, or when coming into contact with medical or other potentially infectious material, or when coming into contact with landfill waste or waste streams containing such infectious material.	Training is required before a task involving potential exposure is performed. Exposure controls and personal protective equipment (PPE) are required. Hepatitis B vaccine must be offered before the person participates in a task where exposure is a possibility.
Bees and other stinging insects may be encountered almost anywhere and may present a serious hazard, particularly to people who are allergic.	Watch for and avoid nests. Keep exposed skin to a minimum. Carry a kit if you have had allergic reactions in the past, and inform the SSO and/or the buddy. If a stinger is present, remove it carefully with tweezers. Wash and disinfect the wound, cover it, and apply ice. Watch for allergic reaction; seek medical attention if a reaction develops.
Other potential biological hazards	None anticipated.

5.3 TICK BITES

Ticks typically are in wooded areas, bushes, tall grass, and brush. Ticks are black, black and red, or brown and can be up to one-quarter inch in size.

Prevention against tick bites includes avoiding tick areas; wearing tightly woven light-colored clothing with long sleeves and wearing pant legs tucked into boots or socks; spraying only outside of clothing with insect repellent containing permethrin or permethrin, and spraying skin with DEET; and checking yourself frequently for ticks and showering as soon as possible. To prevent chemical repellents from

interfering with sample analyses, exercise care while using repellents during the collection and handling of environmental samples.

If bitten by a tick, carefully remove the tick with tweezers, grasping the tick as close as possible to the point of attachment while being careful not to crush the tick. After removing the tick, wash your hands and disinfect and press the bite area. The removed tick should be saved. Report the bite to human resources personnel.

Look for symptoms of Lyme disease or Rocky Mountain spotted fever (RMSF): Lyme - a rash that looks like a bullseye with a small welt in the center; RMSF - a rash of red spots under the skin 3 to 10 days after the tick bite. In both cases, chills, fever, headache, fatigue, stiff neck, bone pain may develop. If symptoms appear, seek medical attention.

5.4 HAZARDS POSED BY CHEMICALS BROUGHT ON THE SITE

5.4.1 Hazard Communication

The project manager is to request MSDSs from the client or from the contractors and the subcontractors for chemicals to which Solutions-IES employees potentially are exposed. The SSO is to do the following:

- Give employees required site-specific hazard communication (HAZCOM) training.
- Confirm that inventory of chemicals brought on the site by subcontractors is available.
- Before or as chemicals arrive on the site, obtain an MSDS for each hazardous chemical.
- Label chemical containers with identity of chemical and with hazard warnings, if any.

The chemical products listed in Table 3-4 will be used on the site. Refer to Attachment 2 for MSDSs.

Chemical	Quantity	Location
HACH Field Test Kit Reagents	< 1 liter, powder	Support Zone
Liqui-Nox (detergent)	< 1 liter, liquid	Support/Decontamination Zone

5.5 CONTAMINANTS OF CONCERN

Contaminants at the site are hydrocarb on fuels that may contain benzene, toluene, ethylbenzene and xylene (BTEX), methyl-tert-butyl ether (MTBE), poly-cyclic aromatic hydrocarbons (PAHs), total recoverable petroleum hydrocarbons (TRPH), petroleum-related volatile organic compounds (VOCs) and sulfate.

5.6 POTENTIAL ROUTES OF EXPOSURE

Potential routes of exposure include:

- **Dermal:** Contact with contaminated media. This route of exposure is minimized through proper use of PPE, as specified in Section 7.
- **Inhalation:** Vapors and contaminated particulates. This route of exposure is minimized through work procedures, engineering controls and respiratory protection if needed.
- **Other:** Inadvertent ingestion of contaminated media. This route should not present a concern if good hygiene practices are followed (e.g., wash hands and face before eating, drinking, or smoking).

6.0 PERSONNEL

6.1 SOLUTIONS-IES EMPLOYEE MEDICAL SURVEILLANCE AND TRAINING

The employees listed in Table 4-1 meet state and federal hazardous waste operations requirements for 40-hour initial training, and 8-hour annual refresher training. Employees designated "SSO" have received 8 hours of supervisor and instrument training and can serve as SSO for the level of protection necessary for this project (Level D). These employees are also "FA-CPR" certified by the American Red Cross, or equivalent, in first aid and cardiopulmonary resuscitation (CPR). At least one FA-CPR designated employee must be present during all tasks performed on the site. The employees listed below are currently active in a medical monitoring program that meets state and federal regulatory requirements for hazardous waste operations.

TABLE 4-1 Project Personnel Safety Certifications		
Employee Name	Responsibility	FA-CPR
Carrie A. Ruhlman	Project Manager	
Joshua T. Clay	SSO	X
Sean K. Jarvah	Alternate SSO	X

6.2 FIELD TEAM CHAIN OF COMMAND AND COMMUNICATION PROCEDURES

6.2.1 Client – NAVFAC Southeast

Contact Name: Barbara Nwokike

6.2.2 Solutions-IES

Project Manager (PM): Carrie A. Ruhlman

Health and Safety Manager (HSM): Walter J. Beckwith

Site Safety Specialist (SSO): Joshua T. Clay, Sean K. Jarvah, or their designees

The SSO is responsible for contacting the project manager. In general, the project manager either will contact or will identify the client contact. The HSM should be contacted as appropriate. The SSO or the project manager must notify the client and the HSM when a serious injury occurs or when health and safety inspections by OSHA or other agencies are conducted. Refer to Sections 10 through 12 for emergency procedures and phone numbers.

6.2.3 Subcontractors

When specified in the project documents (e.g., contract), this plan may cover Solutions-IES subcontractors. However, this plan does not address hazards associated with tasks and equipment that the subcontractor has expertise in (e.g., operation of drill rig). Specialty subcontractors are responsible for health and safety procedures and plans specific to their work. Specialty subcontractors are to submit plans to Solutions-IES for review and approval before the start of fieldwork. Subcontractors should comply with the established health and safety plan(s). Solutions-IES will monitor and enforce compliance with the established plan(s).

General health and safety communication with subcontractors contracted with Solutions-IES and covered by this plan is to be conducted as follows:

- Request that the subcontractor, if a specialty subcontractor, submit a safety or health plan applicable to their expertise (e.g., drill-rig safety plan); attach the reviewed plan.
- Supply subcontractors with a copy of this plan, and brief them on its provisions.
- Direct health and safety communication to the subcontractor-designated safety representative.
- Notify the subcontractor-designated representative if a violation of the plan(s) is observed. Specialty subcontractors are responsible for mitigating hazards in which they have expertise.
- If a hazard condition persists, inform the subcontractor. If the hazard is not mitigated, stop affected work as a last resort and notify the project manager.
- When an apparent imminent danger exists, promptly remove all affected personnel. Notify the project manager.
- Make clear that consistent violations of the health and safety plan by a subcontractor will result in their leaving the site, and may result in termination of the subcontract.

7.0 PERSONAL PROTECTIVE EQUIPMENT

7.1 SELECTION OF PPE

Equipment for personal protection will be selected based on the potential for contact, project site conditions, ambient air quality, and the judgment of supervising project site personnel and project site health and safety professionals. The PPE used will be chosen to be effective against the constituents present at the project.

The level of personal protection selected will be based upon real-time air monitoring of the work environment and an assessment by Solutions-IES' SSO of the potential for skin contact with contaminated materials.

7.2 PPE SPECIFICATIONS

PPE specifications are listed in Table 5-1.

TABLE 5-1 PPE Specifications^a				
Task	Level	Body	Head	Respirator
General Work Uniform when no Chemical Exposure is anticipated	D	Work clothes; steel-toe, steel-shank leather work boots; work gloves	Hardhat ^b Safety glasses Ear protection ^c	None required
Groundwater Sample Collection	D	BOOTS: Steel-toe, steel-shank chemical-resistant boots OR steel-toe, steel-shank leather work boots with outer rubber boot covers GLOVES: chemical-resistant nitrile glove.	Hardhat ^b Safety glasses Ear protection ^c	None required
^a Modifications are as indicated. Solutions-IES will provide PPE to only Solutions-IES employees. Subcontractors are responsible for providing their own PPE. ^b Hard hats are required when working around heavy equipment or when overhead hazards exist, in compliance with 29CFR 1910.135. ^c Ear protection should be worn while working around the flight line or other noise-producing equipment or when conversations cannot be held at distances of 3 feet or less without shouting. Refer to Section 6 for other requirements.				

7.2.1 Upgrading or Downgrading Level of Protection

The reasons for upgrading or downgrading the PPE level are as follows:

- Upgrade
 - Request from individual performing task
 - Change in work task that will increase contact or potential contact with hazardous materials
 - Occurrence or likely occurrence of gas or vapor emission
 - Known or suspected presence of dermal hazards
 - Instrument action levels (Section 6) exceeded

- Downgrade
 - New information indicating that situation is less hazardous than originally thought
 - Change in site conditions that decreases the hazard
 - Change in work task that will reduce contact with hazardous materials

Performing a task that requires an upgrade to a higher level of protection (e.g., Level D to Level C) is permitted only when the PPE requirements have been specified in Section 5.0 and an SSO who meets the requirements specified in Section 4.1 is present.

8.0 AIR MONITORING

Air monitoring will not be performed at the site, due to the low concentrations of COCs present in groundwater and current sampling practices. This HASP will be amended if conditions change and the need for air monitoring is recognized in the future.

9.0 DECONTAMINATION

The SSO must monitor the effectiveness of the decontamination procedures. Decontamination procedures found to be ineffective will be modified by the SSO.

9.1 DECONTAMINATION SPECIFICATIONS

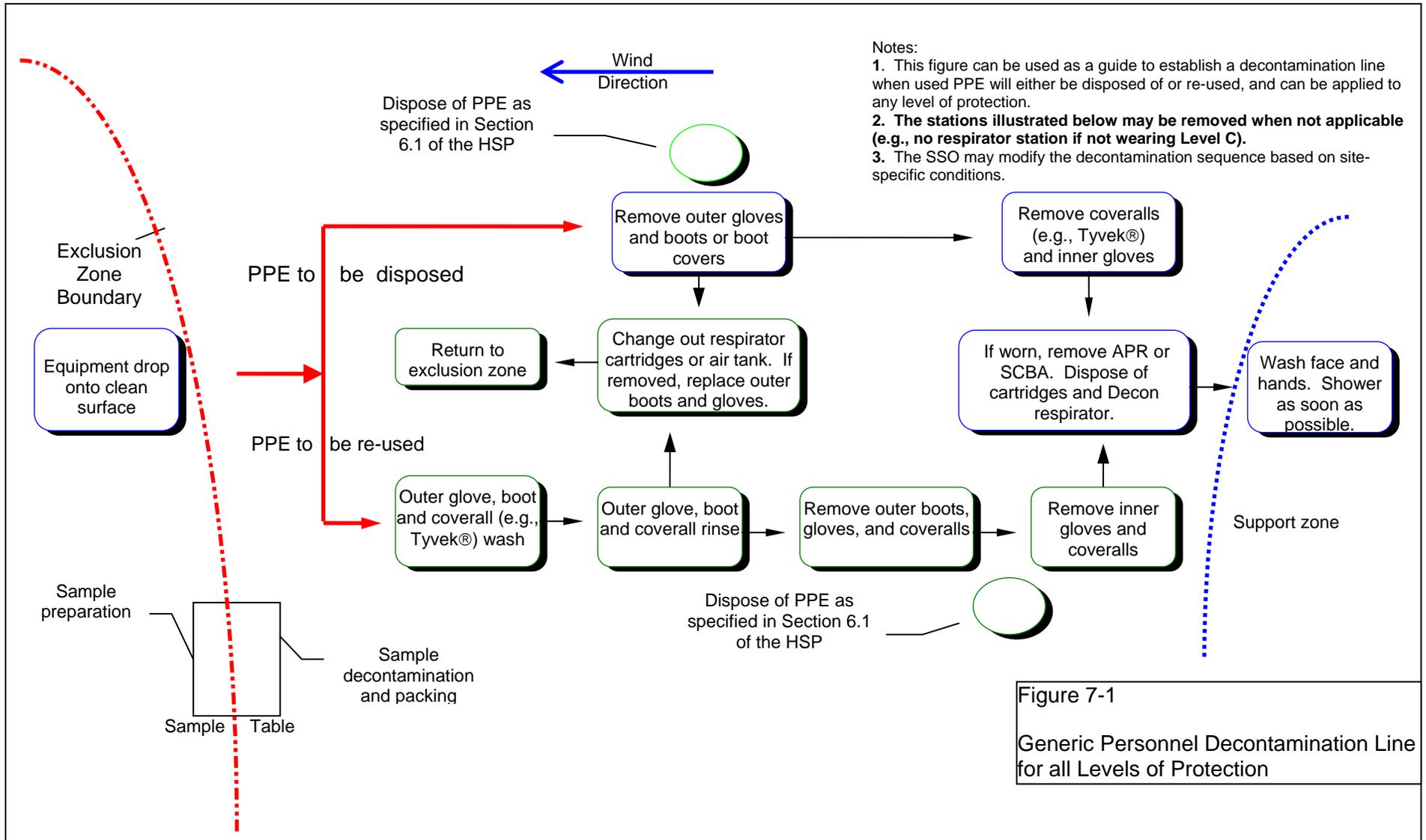
Decontamination specifications are listed in Table 7-1.

TABLE 7-1 Decontamination Specifications		
Personnel	Sample Equipment	Heavy Equipment
Boot wash/rinse	Wash/rinse equipment	Power wash
Glove wash/rinse	Solvent-rinse equipment	Steam clean
Body-suit removal		
Hand wash/rinse		
Face wash/rinse		
PPE-disposal method Dispose in drums	Solvent-disposal method Dispose in drums	Water-disposal method Dispose in drums
Water-disposal method Dispose in drums		

9.2 DIAGRAM OF PERSONNEL-DECONTAMINATION LINE

No eating, drinking, or smoking is permitted in contaminated areas and in exclusion or decontamination zones. The SSO should establish areas for eating, drinking, and smoking. Contact lenses are not permitted in exclusion or decontamination zones.

Figure 7-1 illustrates a typical establishment of work zones, including the decontamination line. Work zones are to be modified by the SSO to accommodate task-specific requirements.



10.0 SITE CONTROL PLAN

10.1 SITE CONTROL PROCEDURES

The following site control procedures will be implemented:

- SSO will conduct a site safety meeting (see below) before starting field activities each day or as tasks and site conditions change.
- Topics for briefing on site safety: work activities to be completed that day, general discussion of health and safety plan, site-specific hazards, locations of work zones, PPE requirements, equipment, special procedures, and emergencies.
- SSO records attendance at safety briefings in logbook and documents topics discussed.
- Determine wind direction.
- Establish work zones: support, decontamination, and exclusion zones. Delineate work zones with flags or cones as appropriate. The support zone (SZ) should be upwind of the site.
- Establish decontamination procedures.
- Use access control at the entry and exit from each work zone.
- Store chemicals in appropriate containers.
- Make MSDSs available for onsite chemicals to which employees are exposed.
- Establish onsite communication consisting of the following:
 - Line-of-sight and hand signals
 - Two-way radio or cellular telephone
- Establish offsite communication.
- Establish and maintain the “buddy system.”
- Establish procedures for disposing of material generated on the site.
- SSO is to conduct periodic inspections of work practices to determine the effectiveness of this plan

11.0 EMERGENCY RESPONSE PLAN

11.1 PRE-EMERGENCY PLANNING

SSO performs the applicable pre-emergency planning tasks before starting field activities, discusses emergency plans with field personnel each day before beginning work, and coordinates emergency response with the facility and local emergency-service providers as appropriate.

- Review the facility emergency and contingency plans where applicable.
- Locate the nearest telephone; determine what onsite communication equipment is available (e.g., two-way radio, cellular phone).
- Identify and communicate chemical, safety, radiological, and biological hazards.
- Confirm and post emergency telephone numbers, evacuation routes, assembly areas, and route to hospital; communicate the information to onsite personnel.
- Review changed site conditions, onsite operations, and personnel availability in relation to emergency response procedures.
- Evaluate capabilities of local response teams where applicable.
- Where appropriate and acceptable to the client, inform emergency room and ambulance and emergency response teams of anticipated types of site emergencies.
- Designate one vehicle as the emergency vehicle; place hospital directions and map inside; keep keys in ignition during field activities.
- Inventory and check site emergency equipment, supplies, and potable water.
- Communicate emergency procedures for personnel injury, exposures, fires, explosions, chemical and vapor releases.
- Review notification procedures for contacting Solutions-IES' Health and Safety Officer.
- Rehearse the emergency response plan once before site activities begin, including driving the route to the hospital.
- Brief all new site workers on the emergency response plan.
- The SSO will evaluate emergency response actions and initiate appropriate follow-up actions.

11.2 EMERGENCY EQUIPMENT AND SUPPLIES

The SSO should mark the locations of emergency equipment on the site map and should post the map. Emergency equipment and its location are listed in Table 11-1. Multiple sets may be necessary for work occurring simultaneously in different areas.

TABLE 11-1 Emergency Equipment	
Emergency Equipment and Supplies	Location
20 lb (or two 10-lb) fire extinguisher (A, B, and C classes)	In Field Vehicle
First aid kit	In Field Vehicle
Eye wash	In Field Vehicle
Potable water	In Field Vehicle
Bloodborne-pathogen kit	In Field Vehicle
Additional equipment (specify)	

11.3 EMERGENCY MEDICAL TREATMENT

Emergency medical treatment procedures are as follows:

- Notify appropriate emergency response authorities listed in Sections 11.9 and 11.11 (e.g., 911).
- The SSO will assume charge during a medical emergency until the ambulance arrives or until the injured person is admitted to the emergency room.
- Prevent further injury.
- Initiate first aid and CPR when needed and where feasible.
- Get medical attention immediately.
- Perform decontamination where feasible; lifesaving and first aid or medical treatment take priority.
- Notify the field team leader and the project manager of the injury.
- Make certain that the injured person is accompanied to the emergency room.
- Notify the Solutions-IES health and safety officer.
- Notify the injured person's human resources department within 24 hours.
- Prepare an incident report. Submit the report to the corporate Director of health and safety and the corporate human resources department within 48 hours.

11.4 NON-EMERGENCY PROCEDURES

The procedures listed above may be applied to non-emergency incidents. Injuries and illnesses (including overexposure to contaminants) must be reported to Human Resources. If there is doubt about whether medical treatment is necessary, or if the injured person is reluctant to accept medical treatment, contact the Solutions-IES health and safety officer.

11.5 INCIDENT RESPONSE

In fires, explosions, or chemical releases, actions to be taken include the following:

- Shut down Solutions-IES' operations and evacuate the immediate work area.
- Account for personnel at the designated assembly area(s).
- Notify appropriate response personnel.
- Assess the need for site evacuation, and evacuate the site as warranted.

Instead of implementing a work-area evacuation, note that small fires or spills posing minimal safety or health hazards may be controlled.

11.6 EVACUATION

Evacuation procedures are as follows:

- Evacuation routes will be designated by the SSO before work begins.
- Onsite and offsite assembly points will be designated before work begins.
- Personnel will leave the exclusion zone and assemble at the onsite assembly point upon hearing the emergency signal for evacuation.
- Personnel will assemble at the offsite point upon hearing the emergency signal for a site evacuation.
- SSO and a "buddy" will remain on the site after the site has been evacuated (if possible) to assist local responders and advise them of the nature and location of the incident.
- SSO accounts for all personnel in the onsite assembly zone.
- A person designated by the SSO before work begins will account for personnel at the offsite assembly area.
- The SSO will write up the incident as soon as possible after it occurs and will submit a report to the corporate director of health and safety.

11.7 EVACUATION ROUTES AND ASSEMBLY POINTS

Evacuation routes and assembly areas (and alternative routes and assembly areas) are specified on the site map posted at the site.

11.8 EVACUATION SIGNALS

Evacuation signals are listed in Table 11-2.

Table 11-2 Evacuation Signals	
Signal	Meaning
Grasping throat with hand	Emergency–help me
Thumbs up	OK; understood
Grasping buddy's wrist	Leave area now
Continuous sounding of horn	Emergency; leave site now

11.9 EMERGENCY RESPONSE TELEPHONE NUMBERS

Emergency response telephone numbers are listed in Table 11-3.

TABLE 11-3 Emergency Response Telephone Numbers	
Site Address: Former NAS Cecil Field	
Police: Jacksonville Police	Phone: 911
Fire: Jacksonville Fire Department	Phone: 911
Ambulance: Jacksonville Fire Department	Phone: 911
Hospital: Orange Park Medical Center 2020 Kingsley Ave. #A, Orange Park, FL	Phone: 904-276-8500
<p>*When using a cellular phone outside the telephone's normal calling area, exercise caution in relying on the cellular phone to activate 911. When the caller is outside the normal calling area, the cellular service carrier should connect the caller with emergency services in the area where the call originated, but this may not occur. Telephone numbers of backup emergency services should be provided if a cellular phone is relied on to activate 911. Locate the closest land line before beginning site activities as a back-up.</p>	

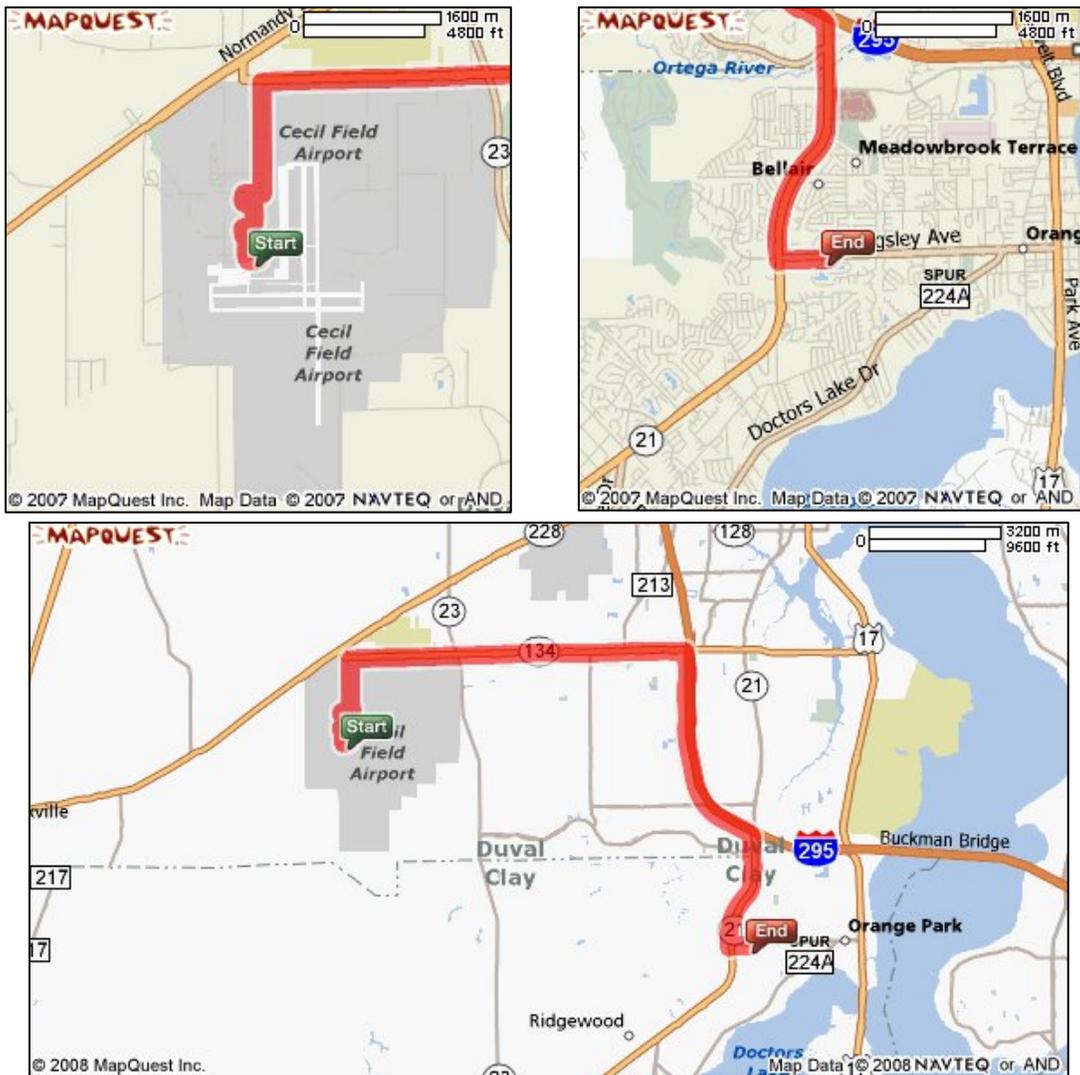
Route to Hospital:

Drive: 16.3 mi – about 28 mins
 16.3 mi – about 28 mins

- | | | |
|---|--------|---------|
| 1. Turn left at Aviation Ave | 1.0 mi | 3 mins |
| 2. Turn right at 103rd St/SR-134 E | 7.1 mi | 11 mins |
| 3. Merge onto I-295 S via the ramp to St Augustine | 3.9 mi | 4 mins |
| 4. Take exit 12 to merge onto Blanding Blvd/SR-21 S | 2.6 mi | 4 mins |
| 5. Turn left at Kingsley Ave | 0.5 mi | 2 mins |

The hospital location map is provided in Figure 11-1.

Figure 11-1 hospital map



11.10 GOVERNMENT AGENCIES INVOLVED IN PROJECT

Federal Agency and Contact Name: NAVFAC Southeast

Contact the Client. Generally, the Client will contact relevant government agencies.

11.11 EMERGENCY CONTACTS

If an injury occurs, notify the injured person's personnel office as soon as possible after obtaining medical attention for the injured person. Notification **MUST** be made within 24 hours of the injury, including the Southern Division NAVFAC HQ Safety Office. Emergency contacts are listed in Table 11-4.

TABLE 11-4
Emergency Contacts

Southern Division NAVFAC HQ Safety Office 843-820-5666
Navy RAC Health and Safety Manager Robert Nash/ATL 770-604-9095
Solutions-IES Project Manager Carrie A. Ruhlman 919-873-1060
Technical Subcontractor (Terraine) Karen Baer 540-322-1446
Client (NAVFAC Southeast) Barbara Nwokike 843-743-2141

12.0 DISTRIBUTION

A copy of this HASP will be provided to the Client for their records. Solutions-IES will also retain a copy of the HASP, which will accompany field personnel during all site work.

Attachment 1
Daily Personnel/Visitor Log Sheet

Attachment 2
HASP Compliance Agreement

Attachment 3
Daily Safety Meeting Log

Daily Safety Meeting Log

Date:	Time:	Project:	SSO:
Work Summary:			
Physical/Chemical Hazards:			
Protective Equipment/Procedures:			
Emergency Procedures:			
Other:			
Names of Attendees (Print)		Signatures of Attendees	

Date:	Time:	Project:	SSO:
Work Summary:			
Physical/Chemical Hazards:			
Protective Equipment/Procedures:			
Emergency Procedures:			
Other:			
Names of Attendees (Print)		Signatures of Attendees	

Date:	Time:	Project:	SSO:
Work Summary:			
Physical/Chemical Hazards:			
Protective Equipment/Procedures:			
Emergency Procedures:			
Other:			
Names of Attendees (Print)		Signatures of Attendees	

Daily Safety Meeting Log

Date:	Time:	Project:	SSO:
Work Summary:			
Physical/Chemical Hazards:			
Protective Equipment/Procedures:			
Emergency Procedures:			
Other:			
Names of Attendees (Print)		Signatures of Attendees	

Date:	Time:	Project:	SSO:
Work Summary:			
Physical/Chemical Hazards:			
Protective Equipment/Procedures:			
Emergency Procedures:			
Other:			
Names of Attendees (Print)		Signatures of Attendees	

Date:	Time:	Project:	SSO:
Work Summary:			
Physical/Chemical Hazards:			
Protective Equipment/Procedures:			
Emergency Procedures:			
Other:			
Names of Attendees (Print)		Signatures of Attendees	

Daily Safety Meeting Log

Date:	Time:	Project:	SSO:
Work Summary:			
Physical/Chemical Hazards:			
Protective Equipment/Procedures:			
Emergency Procedures:			
Other:			
Names of Attendees (Print)		Signatures of Attendees	

Date:	Time:	Project:	SSO:
Work Summary:			
Physical/Chemical Hazards:			
Protective Equipment/Procedures:			
Emergency Procedures:			
Other:			
Names of Attendees (Print)		Signatures of Attendees	

Date:	Time:	Project:	SSO:
Work Summary:			
Physical/Chemical Hazards:			
Protective Equipment/Procedures:			
Emergency Procedures:			
Other:			
Names of Attendees (Print)		Signatures of Attendees	

Daily Safety Meeting Log

Date:	Time:	Project:	SSO:
Work Summary:			
Physical/Chemical Hazards:			
Protective Equipment/Procedures:			
Emergency Procedures:			
Other:			
Names of Attendees (Print)		Signatures of Attendees	

Date:	Time:	Project:	SSO:
Work Summary:			
Physical/Chemical Hazards:			
Protective Equipment/Procedures:			
Emergency Procedures:			
Other:			
Names of Attendees (Print)		Signatures of Attendees	

Date:	Time:	Project:	SSO:
Work Summary:			
Physical/Chemical Hazards:			
Protective Equipment/Procedures:			
Emergency Procedures:			
Other:			
Names of Attendees (Print)		Signatures of Attendees	

Daily Safety Meeting Log

Date:	Time:	Project:	SSO:
Work Summary:			
Physical/Chemical Hazards:			
Protective Equipment/Procedures:			
Emergency Procedures:			
Other:			
Names of Attendees (Print)		Signatures of Attendees	

Date:	Time:	Project:	SSO:
Work Summary:			
Physical/Chemical Hazards:			
Protective Equipment/Procedures:			
Emergency Procedures:			
Other:			
Names of Attendees (Print)		Signatures of Attendees	

Date:	Time:	Project:	SSO:
Work Summary:			
Physical/Chemical Hazards:			
Protective Equipment/Procedures:			
Emergency Procedures:			
Other:			
Names of Attendees (Print)		Signatures of Attendees	

Attachment 4

Project Specific Chemical Product Hazard Communication Form

Attachment 5
Incident/Accident/ Report

Accident/Incident/Corrective Action Report Incident

Employee Name: _____

Date of Accident/Incident: _____

Description:

Date of Investigation

Location of accident/incident?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Any witnesses? (if you answered, yes attached written statement)	<input type="checkbox"/> Yes	<input type="checkbox"/> No

Extent of injuries or property damage-actual or potential

Conditions / Contributing Factors

Weather Conditions: _____

Working Conditions: _____

Recommended Corrective Actions and Responsibilities

Investigated by:

Name:	Signature	Date

Attachment 6
Material Safety Data Sheets

SCOTT SPECIALTY GASES -- ISOBUTYLENE IN AIR - CALIBRATION GAS CYL
MATERIAL SAFETY DATA SHEET

NSN: 6665012148247

Manufacturer's CAGE: 51847

Part No. Indicator: A

Part Number/Trade Name: ISOBUTYLENE IN AIR

=====
General Information
=====

Item Name: CALIBRATION GAS CYL

Company's Name: SCOTT SPECIALTY GASES

Company's Street: ROUTE 611 NORTH

Company's City: PLUMSTEADVILLE

Company's State: PA

Company's Country: US

Company's Zip Code: 18949

Company's Emerg Ph #: 215-766-8861; 908-754-7700

Company's Info Ph #: 215-766-8861

Record No. For Safety Entry: 003

Tot Safety Entries This Stk#: 005

Status: SMJ

Date MSDS Prepared: 23APR92

Safety Data Review Date: 27SEP94

MSDS Serial Number: BVRGC

Hazard Characteristic Code: G3
=====

Ingredients/Identity Information
=====

Proprietary: NO

Ingredient: PROPENE, 2-METHYL-; (ISOBUTYLENE)

Ingredient Sequence Number: 01

NIOSH (RTECS) Number: UD0890000

CAS Number: 115-11-7

OSHA PEL: N/K (FP N)

ACGIH TLV: N/K (FP N)

Proprietary: NO

Ingredient: AIR, REFRIGERATED LIQUID; AIR COMPRESSED (UN1002, DOT); AIR
REFRIGERATED LIQUID (CRYOGENIC LIQUID) (UN1003) (DOT)

Ingredient Sequence Number: 02

NIOSH (RTECS) Number: AX5271000

OSHA PEL: N/K (FP N)

ACGIH TLV: N/K (FP N)
=====

Physical/Chemical Characteristics
=====

Appearance And Odor: COLORLESS GAS W/POSSIBLE SLIGHT OLEFINIC ODOR.
Boiling Point: -318F,-194C
Vapor Pressure (MM Hg/70 F): N/A
Vapor Density (Air=1): 1.2
Specific Gravity: 0.88 (H*2O=1)
Evaporation Rate And Ref: NOT APPLICABLE
Solubility In Water: INSOLUBLE
Percent Volatiles By Volume: 100

Fire and Explosion Hazard Data

Flash Point: NONFLAMMABLE
Lower Explosive Limit: N/A
Upper Explosive Limit: N/A
Extinguishing Media: USE WHAT IS APPROPRIATE FOR SURROUNDING FIRE.
Special Fire Fighting Proc: USE NIOSH/MSHA APPROVED SCBA & FULL PROTECTIVE EQUIPMENT (FP N). USE WATER SPRAY TO KEEP FIRE EXPOSED CYLINDERS COOL.
Unusual Fire And Expl Hazrds: COMPRESSED AIR AT HIGH PRESSURES WILL ACCELERATE THE BURNING OF FLAMMABLE MATERIALS.

Reactivity Data

Stability: YES
Cond To Avoid (Stability): NONE SPECIFIED BY MANUFACTURER.
Materials To Avoid: NONE.
Hazardous Decomp Products: NONE.
Hazardous Poly Occur: NO
Conditions To Avoid (Poly): NOT RELEVANT

Health Hazard Data

LD50-LC50 Mixture: NONE SPECIFIED BY MANUFACTURER.
Route Of Entry - Inhalation: YES
Route Of Entry - Skin: NO
Route Of Entry - Ingestion: NO
Health Haz Acute And Chronic: ACUTE:CONCENTRATION OF ISOBUTYLENE IS THIS MIXTURE SHOULD NOT PRESENT ANY SYMPTOMS OF TOXICITY. CHRONIC:NONE.
Carcinogenicity - NTP: NO
Carcinogenicity - IARC: NO
Carcinogenicity - OSHA: NO
Explanation Carcinogenicity: NOT RELEVANT
Signs/Symptoms Of Overexp: NONE SPECIFIED BY MANUFACTURER.
Med Cond Aggravated By Exp: NONE.
IMMEDIATELY FLUSH W/POTABLE WATER FOR A MINIMUM OF 15 MINUTES, SEEK ASSISTANCE FROM MD (FP N). SKIN:FLUSH W/COPIOUS AMOUNTS OF WATER. CALL MD (FP N). INHAL:IMMEDIATELY REMOVE VICTIM TO FRESH AIR. IF BREATHING HAS STOPPED, GIVE ARTIFICIAL RESPIRATION. IF BREATHING IS DIFFICULT, GIVE OXYGEN.

Precautions for Safe Handling and Use

Steps If Matl Released/Spill: EVACUATE & VENTILATE AREA. REMOVE LEAKING CYLINDER TO EXHAUST HOOD OR SAFE OUTDOORS AREA IF THIS CAN BE DONE SAFELY. Neutralizing Agent: NONE SPECIFIED BY MANUFACTURER.

Waste Disposal Method: DISPOSAL MUST BE I/A/W FEDERAL, STATE & LOCAL REGULATIONS (FP N). RETURN CYLS TO SUPPLIER FOR PROPER DISP W/ANY VALVE OUTLET PLUGS/CAPS SECURED & VALVE PROT CAP IN PLACE. ALLOW GAS TO DISCHARGE

AT SLOW RATE TO ATM IN UNCONFINED AREA/EXHST HOOD.

Precautions-Handling/Storing: STORE IN WELL VENTILATED AREAS ONLY. KEEP VALVE PROT CAP ON CYLS WHEN NOT IN USE & SECURE CYL WHEN USING TO PROT FROM FALLING.

Other Precautions: USE SUITABLE HAND TRUCK TO MOVE CYLS. PROT CYLS FROM PHYSICAL DMG. DO NOT DEFACE CYLS/LBLS. MOVE CYL W/ADEQ HAND TRUCK. CYL SHOULD BE REFILLED BY QUALIFIED PRODUCERS OF COMPRESSED GAS. SHIPMENT OF COMPRESSED GAS CYL WHICH HAS NOT (SUPDAT)

=====
Control Measures
=====

Respiratory Protection: USE NIOSH/MSHA APPROVED SCBA IN CASE OF EMERGENCY OR NON-ROUTINE USE.

Ventilation: PROVIDE ADEQUATE GENERAL & LOCAL EXHAUST VENTILATION.

Protective Gloves: RUBBER GLOVES.

Eye Protection: ANSI APPROVED CHEM WORKERS GOGGS (FP N).

Other Protective Equipment: WEAR SAFETY SHOES. A SAFETY SHOWER & EYEWASH STATION SHOULD BE READILY AVAILABLE.

Work Hygienic Practices: NONE SPECIFIED BY MANUFACTURER.

Suppl. Safety & Health Data: OTHER PREC:BEEN FILLED BY OWNER OR WITH HIS WRITTEN CONSENT IS A VIOLATION OF FEDERAL LAW (49 CFR).

=====
Transportation Data
=====

Trans Data Review Date: 94269
=====

=====
Disposal Data
=====

=====
Label Data
=====

Label Required: YES

Technical Review Date: 27SEP94

Label Date: 26SEP94

Label Status: G

Common Name: ISOBUTYLENE IN AIR

Chronic Hazard: NO

Signal Word: NONE

Acute Health Hazard-None: X

Contact Hazard-None: X

Fire Hazard-None: X

Reactivity Hazard-None: X

Special Hazard Precautions: ACUTE:CONCENTRATION OF ISOBUTYLENE IS THIS

MIXTURE SHOULD NOT PRESENT ANY SYMPTOMS OF TOXICITY. CHRONIC:NONE LISTED
BY

MANUFACTURER.

Protect Eye: Y

Protect Skin: Y

Protect Respiratory: Y

Label Name: SCOTT SPECIALTY GASES

Label Street: ROUTE 611 NORTH

Label City: PLUMSTEADVILLE

Label State: PA

Label Zip Code: 18949

Label Country: US

Label Emergency Number: 215-766-8861; 908-754-7700

ALDRICH CHEMICAL SUB OF SIGMA-ALDRICH -- 65550 METHANOL
MATERIAL SAFETY DATA SHEET

NSN: 681000F030311

Manufacturer's CAGE: 60928

Part No. Indicator: A

Part Number/Trade Name: 65550 METHANOL

=====
General Information
=====

Company's Name: ALDRICH CHEMICAL CO SUB OF SIGMA-ALDRICH

Company's Street: 1001 W ST PAUL AVE

Company's P. O. Box: 355

Company's City: MILWAUKEE

Company's State: WI

Company's Country: US

Company's Zip Code: 53233

Company's Emerg Ph #: 800-325-5832-S/800-231-8327-A

Company's Info Ph #: 800-325-5832-S/800-231-8327-A

Record No. For Safety Entry: 001

Tot Safety Entries This Stk#: 001

Status: SE

Date MSDS Prepared: 01APR92

Safety Data Review Date: 30SEP93

Preparer's Company: ALDRICH CHEMICAL CO SUB OF SIGMA-ALDRICH

Preparer's St Or P. O. Box: 1001 W ST PAUL AVE

Preparer's City: MILWAUKEE

Preparer's State: WI

Preparer's Zip Code: 53233

MSDS Serial Number: BRXZV

=====
Ingredients/Identity Information
=====

Proprietary: NO

Ingredient: METHANOL (METHYL ALCOHOL), COLUMBIAN SPIRITS

Ingredient Sequence Number: 01

NIOSH (RTECS) Number: PC1400000

CAS Number: 67-56-1

OSHA PEL: S,200PPM/250STEL
ACGIH TLV: S,200PPM/250STEL; 93
Other Recommended Limit: 200 PPM

Physical/Chemical Characteristics

Appearance And Odor: COLORLESS LIQUID
Boiling Point: 64.6C
Melting Point: -98C
Vapor Pressure (MM Hg/70 F): 97.68
Vapor Density (Air=1): 1.1
Specific Gravity: 0.791

Fire and Explosion Hazard Data

Flash Point: 52F
Lower Explosive Limit: 6%
Upper Explosive Limit: 36%
Extinguishing Media: CO2, DRY CHEMICAL POWDER OR APPROPRIATE FOAM.
Special Fire Fighting Proc: WEAR SELF-CONTAINED BREATHING APPARATUS & FULL PROTECTIVE CLOTHING.
Unusual Fire And Expl Hazrds: VAPOR MAY TRAVEL CONSIDERABLE DISTANCE TO 725F.

Reactivity Data

Stability: YES
Cond To Avoid (Stability): HEAT, SPARKS, OPEN FLAME OR OTHER SOURCES OF IGNITION.
Materials To Avoid: ACIDS, ACID CHLORIDES, ACID ANHYDRIDES, OXIDIZING/REDUCING AGENTS, ALKALI METALS.
Hazardous Decomp Products: CO, CO2
Hazardous Poly Occur: NO

Health Hazard Data

LD50-LC50 Mixture: ORAL LD50 (RAT): 5628 MG/KG
Route Of Entry - Inhalation: YES
Route Of Entry - Skin: YES
Route Of Entry - Ingestion: YES
Health Haz Acute And Chronic: MAY BE FATAL IF SWALLOWED. HARMFUL IF INHALED OR ABSORBED THROUGH SKIN. VAPOR OR MIST IS IRRITATING TO THEY EYES, MUCOUS MEMBRANES, SKIN, & UPPER RESPIRATORY TRACT. CAN CAUSE DAMAGE TO THE EYES, LIVER, HEART, KIDNEYS. GASTROINTESTINAL DISTURBANCES & CONVULSIONS. MAY CAUSE BLINDNESS IF INGESTED.
Carcinogenicity - NTP: NO
Carcinogenicity - IARC: NO
Carcinogenicity - OSHA: NO
Explanation Carcinogenicity: NONE
Signs/Symptoms Of Overexp: OPTIC NERVE NEUROPATHY, VISUAL FIELD CHANGES,

HEADACHE, DYSPNEA, NAUSEA, VOMITING.
Med Cond Aggravated By Exp: CUTS, SCRATCHES
Emergency/First Aid Proc: EYES/SKIN: FLUSH W/PLENTY OF WATER FOR AT LEAST
15 MINS WHILE REMOVING CONTAMINATED CLOTHING & SHOES. INHALATION: REMOVE
TO
FRESH AIR. IF NOT BREATHING, GIVE ARTIFICIAL RESPIRATION. IF BREATHING IS
DIFFICULT, GIVE OXYGEN. INGESTION: WASH OUT MOUTH W/WATER PROVIDED PERSON
IS CONSCIOUS. DISCARD CONTAMINATED CLOTHING & SHOES. OBTAIN MEDICAL
ATTENTION IN ALL CASES.

=====

Precautions for Safe Handling and Use

=====

Steps If Matl Released/Spill: EVACUATE AREA. SHUT OFF ALL IGNITION
SOURCES. USE PROTECTIVE EQUIP. COVER W/DRY-LIME, SAND OR SODA ASH. PLACE IN
COVERED CONTAINERS USING NON-SPARKING TOOLS & TRANSPORT OUTDOORS.
VENTILATE
AREA & WASH SPILL SITE AFTER MATERIAL PICKUP IS COMPLETE.
Neutralizing Agent: DRY LIME, SAND OR SODA ASH
Waste Disposal Method: BURN IN A CHEMICAL INCINERATOR EQUIPPED W/AN
AFTERBURNER & SCRUBBER BUT EXERT EXTRA CARE IN IGNITING AS THIS MATERIAL
IS
HIGHLY FLAMMABLE. OBSERVE ALL FEDERAL, STATE & LOCAL LAWS. UN1230.
Precautions-Handling/Storing: KEEP TIGHTLY CLOSED & AWAY FROM HEAT, SPARKS
& OPEN FLAME. PRODUCT IS HYGROSCOPIC. STORE IN A COOL DRY PLACE. NO
SMOKING. CANNOT BE MADE NON-POISONOUS
Other Precautions: AVOID CONTACT W/EYES, SKIN, CLOTHING & BREATHING OF
VAPORS. DON'T USE IF SKIN IS CUT OR SCRATCHED.

=====

Control Measures

=====

Respiratory Protection: WEAR AN APPROPRIATE NIOSH/MSHA APPROVED
RESPIRATOR.
Ventilation: MECHANICAL EXHAUST
Protective Gloves: CHEMICAL RESISTANT
Eye Protection: SAFETY GOGGLES
Other Protective Equipment: RUBBER BOOTS, SAFETY SHOWER, EYE BATH
Work Hygienic Practices: WASH THOROUGHLY AFTER HANDLING.

=====

Transportation Data

=====

=====

Disposal Data

=====

=====

Label Data

=====

Label Required: YES
Technical Review Date: 30SEP93
Label Date: 17SEP93
Label Status: F

Common Name: 65550 METHANOL

Chronic Hazard: YES

Signal Word: DANGER!

Acute Health Hazard-Severe: X

Contact Hazard-Severe: X

Fire Hazard-Severe: X

Reactivity Hazard-Slight: X

Special Hazard Precautions: MAY BE FATAL IF SWALLOWED. HARMFUL IF INHALED OR ABSORBED THROUGH SKIN. VAPOR OR MIST IS IRRITATING TO THE EYES, MUCOUS MEMBRANES, SKIN, & UPPER RESPIRATORY TRACT. CAN CAUSE DAMAGE TO THE EYES, LIVER, HEART, KIDNEYS. GASTROINTESTINAL DISTURBANCES & CONVULSIONS. MAY CAUSE BLINDNESS IF INGESTED. TARGET ORGANS: EYES, SKIN, LIVER, HEART, KIDNEYS, RESPIRATORY & DIGESTIVE TRACTS. DIGESTIVE TRACTS, LIVER.

Protect Eye: Y

Protect Skin: Y

Protect Respiratory: Y

Label Name: ALDRICH CHEMICAL CO SUB OF SIGMA-ALDRICH

Label Street: 1001 W ST PAUL AVE

Label P.O. Box: 355

Label City: MILWAUKEE

Label State: WI

Label Zip Code: 53233

Label Country: US

Label Emergency Number: 800-325-5832-S/800-231-8327-A

Year Procured: UNK

LIQUINOX MSDS

Section 1 : PRODUCT AND COMPANY IDENTIFICATION

Chemical family: Detergent.

Manufacturer: Alconox, Inc.
30 Glenn St.
Suite 309
White Plains, NY 10603.

Manufacturer emergency 800-255-3924.

phone number: 813-248-0585 (outside of the United States).

Supplier: Same as manufacturer.

Product name: Liquinox

Section 2 : INGREDIENT INFORMATION

C.A.S.	CONCENTRATION %	Ingredient Name	T.L.V.	LD/50	LC/50
25155-30-0	10-30	SODIUM DODECYLBENZENESULFONATE	NOT AVAILABLE	438 MG/KG RAT ORAL 1330 MG/KG MOUSE ORAL	NOT AVAILABLE

Section 3 : HAZARD IDENTIFICATION

Route of entry: Skin contact, eye contact, inhalation and ingestion.

Effects of acute exposure

Eye contact: May cause irritation.

Skin contact: Prolonged and repeated contact may cause irritation.

Inhalation: May cause headache and nausea.

Ingestion: May cause vomiting and diarrhea.
May cause gastric distress.

Effects of chronic exposure: See effects of acute exposure.

Section 4 : FIRST AID MEASURES

Skin contact: Remove contaminated clothing.
Wash thoroughly with soap and water.
Seek medical attention if irritation persists.

Eye contact: Check for and remove contact lenses.
Flush eyes with clear, running water for 15 minutes while holding eyelids open: if irritation persists, consult a physician.

Inhalation: Remove victim to fresh air.
If irritation persists, seek medical attention.

Ingestion: Do not induce vomiting, seek medical attention.
Dilute with two glasses of water.
Never give anything by mouth to an unconscious person.

Section 5 : FIRE FIGHTING MEASURES

Flammability: Not flammable.

Conditions of flammability: Surrounding fire.

Extinguishing media: Carbon dioxide, dry chemical, foam.
Water
Water fog.

Special procedures: Self-contained breathing apparatus required.
Firefighters should wear the usual protective gear.
Use water spray to cool fire exposed containers.

Auto-ignition temperature: Not available.

Flash point (°C), method: None

Lower flammability limit (% vol): Not applicable.

Upper flammability limit (% vol): Not applicable.

Explosion Data

Sensitivity to static discharge: Not available.

Sensitivity to mechanical impact: Not available.

Hazardous combustion products: Oxides of carbon (COx).
Hydrocarbons.

Rate of burning: Not available.

Explosive power: Containers may rupture if exposed to heat or fire.

Section 6 : ACCIDENTAL RELEASE MEASURES

Leak/Spill: Contain the spill.
Prevent entry into drains, sewers, and other waterways.
Wear appropriate protective equipment.
Small amounts may be flushed to sewer with water.
Soak up with an absorbent material.
Place in appropriate container for disposal.
Notify the appropriate authorities as required.

Section 7 : HANDLING AND STORAGE

Handling procedures and equipment: Protect against physical damage.
Avoid breathing vapors/mists.
Wear personal protective equipment appropriate to task.
Wash thoroughly after handling.
Keep out of reach of children.
Avoid contact with skin, eyes and clothing.
Avoid extreme temperatures.
Launder contaminated clothing prior to reuse.

Storage requirements: Store away from incompatible materials.
Keep containers closed when not in use.

Section 8 : EXPOSURE CONTROLS / PERSONAL PROTECTION

Precautionary Measures

Gloves/Type:



Wear appropriate gloves.

Respiratory/Type: None required under normal use.

Eye/Type:



Safety glasses recommended.

Footwear/Type: Safety shoes per local regulations.

Clothing/Type: As required to prevent skin contact.

Other/Type: Eye wash facility should be in close proximity.
Emergency shower should be in close proximity.

Ventilation requirements: Local exhaust at points of emission.

Exposure limit of material: Not available.

Section 9 : PHYSICAL AND CHEMICAL PROPERTIES

Physical state: Liquid.

Appearance & odor: Odourless.
Pale yellow.

Odor threshold (ppm): Not available.

Vapour pressure @ 20°C (68°F):
(mmHg): 17

Vapour density (air=1): >1

Volatiles (%)

By volume: Not available.

Evaporation rate (butyl acetate = 1): < 1.

Boiling point (°C): 100 (212F)

Freezing point (°C): Not available.

pH: 8.5

Specific gravity @ 20 °C: (water = 1).
1.083

Solubility in water (%): Complete.

Coefficient of water\oil dist.: Not available.

VOC: None

Chemical family: Detergent.

Section 10 : STABILITY AND REACTIVITY

Chemical stability: Product is stable under normal handling and storage conditions.

Conditions of instability: Extreme temperatures.

Hazardous polymerization: Will not occur.

Incompatible substances: Strong acids.
Strong oxidizing agents.

Hazardous decomposition products: See hazardous combustion products.

Section 11 : TOXICOLOGICAL INFORMATION

LD50 of product, species & route: > 5000 mg/kg rat oral.

LC50 of product, species & route: Not available.

Sensitization to product: Not available.

Carcinogenic effects: Not listed as a carcinogen.

Reproductive effects: Not available.

Teratogenicity: Not available.

Mutagenicity: Not available.

Synergistic materials: Not available.

Section 12 : ECOLOGICAL INFORMATION

Environmental toxicity: No data at this time.

Environmental fate: No data at this time.

Section 13 : DISPOSAL CONSIDERATIONS

Waste disposal: In accordance with local and federal regulations.

Section 14 : TRANSPORT INFORMATION

D.O.T. CLASSIFICATION: Not regulated.

Special shipping information: Not regulated.

Section 15 : REGULATORY INFORMATION

Canadian Regulatory Information

WHMIS classification: Not controlled.

DSL status: Not available.

USA Regulatory Information

SARA hazard categories sections 311/312: Immediate (Acute) Health Hazard: No.
Delayed (Chronic) Health Hazard: No.
Fire Hazard: No.
Sudden Release of Pressure: No.
Reactive: No.

SARA Section 313: None

TSCA inventory: All components of this product are listed on the TSCA inventory.

NFPA

Health Hazard: 1

Flammability: 0

Reactivity: 0

HMIS

Health Hazard: 1

Flammability: 0

Physical hazard: 0

PPE: A

Section 16 : OTHER INFORMATION

Supplier MSDS date: 2006/07/14

Data prepared by: Global Safety Management
3340 Peachtree Road, #1800
Atlanta, GA 30326

Phone: 877-683-7460
Fax: (877) 683-7462

Web: www.globalsafetynet.com
Email: info@globalsafetynet.com.

General note: This material safety data sheet was prepared from information obtained from various sources, including product suppliers and the Canadian Center for Occupational Health and Safety.

World Headquarters
Hach Company
P.O.Box 389
Loveland, CO USA 80539
(970) 669-3050

MSDS No: M00621

MATERIAL SAFETY DATA SHEET

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Name: Sulfuric Acid Standard Solution 0.035 N
Catalog Number: 2349732

Hach Company
P.O.Box 389
Loveland, CO USA 80539
(970) 669-3050

Emergency Telephone Numbers:
(Medical and Transportation)
(303) 623-5716 24 Hour Service
(515)232-2533 8am - 4pm CST

MSDS Number: M00621
Chemical Name: Not applicable
CAS No.: Not applicable
Chemical Formula: Not applicable
Chemical Family: Not applicable
Hazard: May cause eye irritation.
Date of MSDS Preparation:
Day: 29
Month: April
Year: 2006

2. COMPOSITION / INFORMATION ON INGREDIENTS

Demineralized Water

CAS No.: 7732-18-5
TSCA CAS Number: 7732-18-5
Percent Range: 90.0 - 100.0
Percent Range Units: volume / volume
LD50: None reported
LC50: None reported
TLV: Not established
PEL: Not established
Hazard: No effects anticipated.

Isopropanol

CAS No.: 67-63-0
TSCA CAS Number: 67-63-0
Percent Range: 1.0 - 10.0
Percent Range Units: volume / volume
LD50: Oral rat LD50 = 5045 mg/kg Oral Human LDLo = 2770 mg/kg
LC50: Inhalation rat LCLo = 12000 ppm/8hr
TLV: 400 ppm (500 ppm STEL)
PEL: 400 ppm
Hazard: Flammable. Causes moderate eye irritation.

Sulfuric Acid

CAS No.: 7664-93-9
TSCA CAS Number: 7664-93-9

Percent Range: < 0.5

Percent Range Units: weight / weight

LD50: Oral rat LD50 = 2140 mg/kg.

LC50: Inhalation rat LC50 = 87 ppm/4 hr

TLV: 1 mg/m³ (TWA); 3 mg/m³ (STEL)

PEL: 1 mg/m³

Hazard: Causes severe burns. Harmful if inhaled. Recognized carcinogen.

3. HAZARDS IDENTIFICATION

Emergency Overview:

Appearance: Clear, colorless liquid

Odor: Alcoholic

MAY CAUSE EYE IRRITATION

HMIS:

Health: 1

Flammability: 1

Reactivity: 0

Protective Equipment: X - See protective equipment, Section 8.

NFPA:

Health: 1

Flammability: 1

Reactivity: 0

Symbol: Not applicable

Potential Health Effects:

Eye Contact: May cause irritation

Skin Contact: May cause irritation

Skin Absorption: No effects anticipated

Target Organs: Not applicable

Ingestion: Very large doses may cause: drowsiness dizziness incoordination headache abdominal pain nausea vomiting diarrhea blood pressure changes rapid pulse and respirations

Target Organs: Central nervous system

Inhalation: No effects anticipated

Target Organs: Not applicable

Medical Conditions Aggravated: Pre-existing: Skin conditions

Chronic Effects: None reported

Cancer / Reproductive Toxicity Information:

This product does NOT contain any OSHA listed carcinogens.

This product does NOT contain any IARC listed chemicals.

This product does NOT contain any NTP listed chemicals.

Additional Cancer / Reproductive Toxicity Information: Contains: an experimental teratogen.

Toxicologically Synergistic Products: None reported

4. FIRST AID

Eye Contact: Immediately flush eyes with water for 15 minutes. Call physician.

Skin Contact (First Aid): Wash skin with plenty of water.

Ingestion (First Aid): Give large quantities of water. Call physician immediately.

Inhalation: None required.

5. FIRE FIGHTING MEASURES

Flammable Properties: During a fire, this product decomposes to form toxic gases.

Flash Point: >212°F (100°C)

Method: Closed cup

Flammability Limits:

Lower Explosion Limits: Not determined

Upper Explosion Limits: Not determined

Autoignition Temperature: Not determined

Hazardous Combustion Products: Toxic fumes of: sulfur oxides, carbon monoxide, carbon dioxide.

Fire / Explosion Hazards: May react violently with: strong oxidizers

Static Discharge: None reported.

Mechanical Impact: None reported

Extinguishing Media: Water, Carbon dioxide, Dry chemical.

Fire Fighting Instruction: As in any fire, wear self-contained breathing apparatus pressure-demand and full protective gear.

6. ACCIDENTAL RELEASE MEASURES

Spill Response Notice:

Only persons properly qualified to respond to an emergency involving hazardous substances may respond to a spill according to federal regulations (OSHA 29 CFR 1910.120(a)(v)) and per your company's emergency response plan and guidelines/procedures. See Section 13, Special Instructions for disposal assistance.

Containment Technique: Absorb spilled liquid with non-reactive sorbent material. Stop spilled material from being released to the environment.

Clean-up Technique: Cover spilled material with an alkali, such as soda ash or sodium bicarbonate. Scoop up slurry into a large beaker. Adjust to a pH between 6 and 9 with an alkali, such as soda ash or sodium bicarbonate. Flush reacted material to the drain with a large excess of water. Decontaminate the area of the spill with a soap solution.

Evacuation Procedure: Evacuate as needed to perform spill clean-up. If conditions warrant, increase the size of the evacuation.

Special Instructions (for accidental release): Product is regulated as RCRA hazardous waste.

304 EHS RQ (40 CFR 355): Sulfuric Acid - RQ 1000 lbs.

D.O.T. Emergency Response Guide Number: None

7. HANDLING / STORAGE

Handling: Avoid contact with eyes, skin, clothing. Do not breathe mist or vapors. Wash thoroughly after handling. Maintain general industrial hygiene practices when using this product.

Storage: Keep away from: oxidizers. Protect from: heat, sparks, flames and other ignition sources. Keep container tightly closed when not in use.

Flammability Class: Class IIIB

8. EXPOSURE CONTROLS / PROTECTIVE EQUIPMENT

Engineering Controls: Have an eyewash station nearby. Maintain general industrial hygiene practices when using this product.

Personal Protective Equipment:

Eye Protection: safety glasses with top and side shields

Skin Protection: disposable latex gloves, lab coat

Inhalation Protection: adequate ventilation

Precautionary Measures: Avoid contact with: eyes skin clothing Do not breathe: mist/vapor Wash thoroughly after handling. Keep away from: oxidizers Protect from: heat sparks, flames and other ignition sources

TLV: Not established

PEL: Not established

9. PHYSICAL / CHEMICAL PROPERTIES

Appearance: Clear, colorless liquid

Physical State: Liquid

Molecular Weight: Not applicable

Odor: Alcoholic

pH: 1.6

Vapor Pressure: Not determined

Vapor Density (air = 1): Not determined

Boiling Point: 89°C

Melting Point: -1°C

Specific Gravity (water = 1): 0.9943

Evaporation Rate (water = 1): 0.86

Volatile Organic Compounds Content: Not determined

Partition Coefficient (n-octanol / water): Not applicable

Solubility:

Water: Soluble

Acid: Soluble

Other: Not determined

Metal Corrosivity:

Steel: 0.055 in/yr

Aluminum: 0.041 in/yr

10. STABILITY / REACTIVITY

Chemical Stability: Stable when stored under proper conditions.

Conditions to Avoid: Contact with heat, sparks, open flames or other ignition sources. Extreme temperatures

Reactivity / Incompatibility: Incompatible with: oxidizers

Hazardous Decomposition: Toxic fumes of: sulfur oxides carbon monoxide carbon dioxide

Hazardous Polymerization: Will not occur.

11. TOXICOLOGICAL INFORMATION

Product Toxicological Data:

LD50: None reported

LC50: None reported

Dermal Toxicity Data: None reported

Skin and Eye Irritation Data: None reported

Mutation Data: None reported

Reproductive Effects Data: None reported

Ingredient Toxicological Data: Isopropanol: Oral rat LD₅₀ = 5045 mg/kg, Oral human LD_{Lo} = 2770 mg/kg

12. ECOLOGICAL INFORMATION

Product Ecological Information: --

No ecological data available for this product.

Ingredient Ecological Information: --

No ecological data available for the ingredients of this product.

13. DISPOSAL CONSIDERATIONS

EPA Waste ID Number: D002

Special Instructions (Disposal): Dilute to 3 to 5 times the volume with cold water. Adjust to a pH between 6 and 9 with an alkali, such as soda ash or sodium bicarbonate. Open cold water tap completely, slowly pour the reacted material to the drain. Flush system with plenty of water.

Empty Containers: Rinse three times with an appropriate solvent. Dispose of empty container as normal trash.

NOTICE (Disposal): These disposal guidelines are based on federal regulations and may be superseded by more stringent state or local requirements. Please consult your local environmental regulators for more information.

14. TRANSPORT INFORMATION

D.O.T.:

D.O.T. Proper Shipping Name: Not Currently Regulated

--

DOT Hazard Class: NA

DOT Subsidiary Risk: NA

DOT ID Number: NA

DOT Packing Group: NA

I.C.A.O.:

I.C.A.O. Proper Shipping Name: Not Currently Regulated

--

ICAO Hazard Class: NA

ICAO Subsidiary Risk: NA

ICAO ID Number: NA

ICAO Packing Group: NA

I.M.O.:

I.M.O. Proper Shipping Name: Not Currently Regulated

--

I.M.O. Hazard Class: NA

I.M.O. Subsidiary Risk: NA

I.M.O. ID Number: NA

I.M.O. Packing Group: NA

Additional Information: This product may be shipped as part of a chemical kit composed of various compatible dangerous goods for analytical or testing purposes. This kit would have the following classification:

Hazard Class: 9 UN Number 3316.

Proper Shipping Name: Chemical Kit

15. REGULATORY INFORMATION

U.S. Federal Regulations:

O.S.H.A.: This product meets the criteria for a hazardous substance as defined in the Hazard Communication Standard. (29 CFR 1910.1200)

E.P.A.:

S.A.R.A. Title III Section 311/312 Categorization (40 CFR 370): Immediate (Acute) Health Hazard

S.A.R.A. Title III Section 313 (40 CFR 372): This product does NOT contain any chemical subject to the reporting requirements of Section 313 of Title III of SARA.

--

302 (EHS) TPQ (40 CFR 355): Sulfuric Acid 1000 lbs.

304 CERCLA RQ (40 CFR 302.4): Sulfuric Acid 1000 lbs.

304 EHS RQ (40 CFR 355): Sulfuric Acid - RQ 1000 lbs.

Clean Water Act (40 CFR 116.4): Sulfuric acid - RQ 1000 lbs.

RCRA: Contains RCRA regulated substances. See Section 13, EPA Waste ID Number.

C.P.S.C.: Not applicable

State Regulations:

California Prop. 65: No Prop. 65 listed chemicals are present in this product.

Identification of Prop. 65 Ingredient(s): None

Trade Secret Registry: Not applicable

National Inventories:

U.S. Inventory Status: All ingredients in this product are listed on the TSCA 8(b) Inventory (40 CFR 710).

TSCA CAS Number: Not applicable

16. OTHER INFORMATION

Intended Use: Standard solution

References: 29 CFR 1900 - 1910 (Code of Federal Regulations - Labor). Air Contaminants, Federal Register, Vol. 54, No. 12. Thursday, January 19, 1989. pp. 2332-2983. TLV's Threshold Limit Values and Biological Exposure Indices for 1992-1993. American Conference of Governmental Industrial Hygienists, 1992.

Technical Judgment. In-house information. Fire Protection Guide on Hazardous Materials, 10th Ed. Quincy, MA: National Fire Protection Fire Protection Guide on Hazardous Materials, 10th Ed. Quincy, MA: National Fire Protection Association, 1991.

Revision Summary: Updates in Section(s) 14,

Legend:

NA - Not Applicable	w/w - weight/weight
ND - Not Determined	w/v - weight/volume
NV - Not Available	v/v - volume/volume

USER RESPONSIBILITY: Each user should read and understand this information and incorporate it in individual site safety programs in accordance with applicable hazard communication standards and regulations.

THE INFORMATION CONTAINED HEREIN IS BASED ON DATA CONSIDERED TO BE ACCURATE. HOWEVER, NO WARRANTY IS EXPRESSED OR IMPLIED REGARDING THE ACCURACY OF THESE DATA OR THE RESULTS TO BE OBTAINED FROM THE USE THEREOF.

HACH COMPANY ©2007

World Headquarters
Hach Company
P.O.Box 389
Loveland, CO USA 80539
(970) 669-3050

MSDS No: M00008

MATERIAL SAFETY DATA SHEET

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Name: Phenolphthalein Indicator Powder
Catalog Number: 94299

Hach Company
P.O.Box 389
Loveland, CO USA 80539
(970) 669-3050

Emergency Telephone Numbers:
(Medical and Transportation)
(303) 623-5716 24 Hour Service
(515)232-2533 8am - 4pm CST

MSDS Number: M00008
Chemical Name: Not applicable
CAS No.: Not applicable
Chemical Formula: Not applicable
Chemical Family: Not applicable
Hazard: May cause eye irritation. Experimental carcinogen.
Date of MSDS Preparation:
Day: 06
Month: February
Year: 2007

2. COMPOSITION / INFORMATION ON INGREDIENTS

Phenolphthalein

CAS No.: 77-09-8
TSCA CAS Number: 77-09-8
Percent Range: <2
Percent Range Units: weight / weight
LD50: None reported
LC50: None reported
TLV: Not established
PEL: Not established
Hazard: May cause allergic reaction. May cause irritation. Suspected carcinogen.

Other component

CAS No.: Not applicable
TSCA CAS Number: Not applicable
Percent Range: < 1.0
Percent Range Units: weight / weight
LD50: Not applicable
LC50: Not applicable
TLV: Not established
PEL: Not established
Hazard: Any ingredient(s) of this product listed as "Other component(s)" is not considered a health hazard to the user of this product.

Sodium Chloride

CAS No.: 7647-14-5
TSCA CAS Number: 7647-14-5
Percent Range: >95.0
Percent Range Units: weight / weight
LD50: Oral rat LD50 = 3000 mg/kg
LC50: None reported
TLV: Not established
PEL: Not established
Hazard: Causes moderate eye irritation.

3. HAZARDS IDENTIFICATION

Emergency Overview:

Appearance: White or light pink powder

Odor: None

MAY CAUSE EYE IRRITATION

CONTAINS MATERIAL WHICH MAY CAUSE CANCER BASED ON ANIMAL DATA

HMIS:

Health: 2*

Flammability: 0

Reactivity: 0

Protective Equipment: X - See protective equipment, Section 8.

NFPA:

Health: 1

Flammability: 0

Reactivity: 0

Symbol: Not applicable

Potential Health Effects:

Eye Contact: Causes moderate irritation

Skin Contact: Causes mild irritation

Skin Absorption: No effects anticipated

Target Organs: Not applicable

Ingestion: May cause: dehydration vomiting blood pressure changes muscular twitching rigidity

Target Organs: None reported

Inhalation: No effects anticipated

Target Organs: Not applicable

Medical Conditions Aggravated: Pre-existing: Eye conditions

Chronic Effects: None reported

Cancer / Reproductive Toxicity Information:

This product does NOT contain any OSHA listed carcinogens.

An ingredient of this mixture is: IARC Group 2B: Experimental Carcinogen
Phenolphthalein

An ingredient of this mixture is: NTP Listed Group 2B: Experimental Carcinogen
Phenolphthalein

Additional Cancer / Reproductive Toxicity Information: Contains: a suspected mutagen.

Toxicologically Synergistic Products: None reported

4. FIRST AID

Eye Contact: Flush eyes with water. Call physician if irritation develops.

Skin Contact (First Aid): Wash skin with plenty of water.

Ingestion (First Aid): Give large quantities of water. Call physician immediately.

Inhalation: Remove to fresh air.

5. FIRE FIGHTING MEASURES

Flammable Properties: During a fire, this product decomposes to form toxic gases.

Flash Point: Not applicable

Method: Not applicable

Flammability Limits:

Lower Explosion Limits: Not applicable

Upper Explosion Limits: Not applicable

Autoignition Temperature: Not applicable

Hazardous Combustion Products: Toxic fumes of: chlorides sodium oxides

Fire / Explosion Hazards: May react violently with: bromine trifluoride

Static Discharge: None reported.

Mechanical Impact: None reported

Extinguishing Media: Use media appropriate to surrounding fire conditions

Fire Fighting Instruction: As in any fire, wear self-contained breathing apparatus pressure-demand and full protective gear.

6. ACCIDENTAL RELEASE MEASURES

Spill Response Notice:

Only persons properly qualified to respond to an emergency involving hazardous substances may respond to a spill according to federal regulations (OSHA 29 CFR 1910.120(a)(v)) and per your company's emergency response plan and guidelines/procedures. See Section 13, Special Instructions for disposal assistance.

Containment Technique: Stop spilled material from being released to the environment.

Clean-up Technique: Scoop up spilled material into a large beaker and dissolve with water. Dilute with a large excess of water. Flush the spilled material to the drain with a large excess of water. Decontaminate the area of the spill with a soap solution.

Evacuation Procedure: Evacuate as needed to perform spill clean-up. If conditions warrant, increase the size of the evacuation.

Special Instructions (for accidental release): Not applicable

304 EHS RQ (40 CFR 355): Not applicable

D.O.T. Emergency Response Guide Number: None

7. HANDLING / STORAGE

Handling: Avoid contact with eyes skin Wash thoroughly after handling. Maintain general industrial hygiene practices when using this product.

Storage: Keep container tightly closed when not in use.

Flammability Class: Not applicable

8. EXPOSURE CONTROLS / PROTECTIVE EQUIPMENT

Engineering Controls: Maintain general industrial hygiene practices when using this product.

Personal Protective Equipment:

Eye Protection: safety glasses with top and side shields

Skin Protection: disposable latex gloves lab coat

Inhalation Protection: adequate ventilation

Precautionary Measures: Avoid contact with: eyes skin Wash thoroughly after handling.

TLV: Not established

PEL: Not established

9. PHYSICAL / CHEMICAL PROPERTIES

Appearance: White or light pink powder
Physical State: Solid
Molecular Weight: Not applicable
Odor: None
pH: of 5% solution = 6.2
Vapor Pressure: Not applicable
Vapor Density (air = 1): Not applicable
Boiling Point: Not applicable
Melting Point: 258°-262°C (496°-504°F)
Specific Gravity (water = 1): 2.10
Evaporation Rate (water = 1): Not applicable
Volatile Organic Compounds Content: Not applicable
Partition Coefficient (n-octanol / water): Not determined
Solubility:
 Water: Soluble
 Acid: Soluble
 Other: Not determined
Metal Corrosivity:
 Steel: Not determined
 Aluminum: Not determined

10. STABILITY / REACTIVITY

Chemical Stability: Stable when stored under proper conditions.
Conditions to Avoid: Heating to decomposition. Excess moisture
Reactivity / Incompatibility: Incompatible with: bromine trifluoride lithium
Hazardous Decomposition: Toxic fumes of: chlorides sodium oxides
Hazardous Polymerization: Will not occur.

11. TOXICOLOGICAL INFORMATION

Product Toxicological Data:
 LD50: None reported
 LC50: None reported
 Dermal Toxicity Data: None reported
 Skin and Eye Irritation Data: None reported
 Mutation Data: None reported
 Reproductive Effects Data: In a laboratory test, single subcutaneous injection of sodium chloride into pregnant mice at the level of 2500 mg/kg caused fetal deaths and malformations.
Ingredient Toxicological Data: Sodium Chloride: Oral rat LD50 = 3000 mg/kg

12. ECOLOGICAL INFORMATION

Product Ecological Information: --
No ecological data available for this product.
Ingredient Ecological Information: --
No ecological data available for the ingredients of this product.

13. DISPOSAL CONSIDERATIONS

EPA Waste ID Number: None

Special Instructions (Disposal): Dilute material with excess water making a weaker than 5% solution. Open cold water tap completely, slowly pour the material to the drain. Flush system with plenty of water.

Empty Containers: Rinse three times with an appropriate solvent. Dispose of empty container as normal trash.

NOTICE (Disposal): These disposal guidelines are based on federal regulations and may be superseded by more stringent state or local requirements. Please consult your local environmental regulators for more information.

14. TRANSPORT INFORMATION

D.O.T.:

D.O.T. Proper Shipping Name: Not Currently Regulated

--

DOT Hazard Class: NA

DOT Subsidiary Risk: NA

DOT ID Number: NA

DOT Packing Group: NA

I.C.A.O.:

I.C.A.O. Proper Shipping Name: Not Currently Regulated

--

ICAO Hazard Class: NA

ICAO Subsidiary Risk: NA

ICAO ID Number: NA

ICAO Packing Group: NA

I.M.O.:

I.M.O. Proper Shipping Name: Not Currently Regulated

--

I.M.O. Hazard Class: NA

I.M.O. Subsidiary Risk: NA

I.M.O. ID Number: NA

I.M.O. Packing Group: NA

Additional Information: This product may be shipped as part of a chemical kit composed of various compatible dangerous goods for analytical or testing purposes. This kit would have the following classification:

Hazard Class: 9 UN Number 3316.

Proper Shipping Name: Chemical Kit

15. REGULATORY INFORMATION

U.S. Federal Regulations:

O.S.H.A.: This product meets the criteria for a hazardous substance as defined in the Hazard Communication Standard. (29 CFR 1910.1200)

E.P.A.:

S.A.R.A. Title III Section 311/312 Categorization (40 CFR 370): Immediate (Acute) Health Hazard
Delayed (Chronic) Health Hazard

S.A.R.A. Title III Section 313 (40 CFR 372): This product does NOT contain any chemical subject to the reporting requirements of Section 313 of Title III of SARA.

--

302 (EHS) TPQ (40 CFR 355): Not applicable

304 CERCLA RQ (40 CFR 302.4): Not applicable

304 EHS RQ (40 CFR 355): Not applicable

Clean Water Act (40 CFR 116.4): Not applicable

RCRA: Contains no RCRA regulated substances.

C.P.S.C.: Not applicable

State Regulations:

California Prop. 65: WARNING - This product contains a chemical known to the State of California to cause cancer.

Identification of Prop. 65 Ingredient(s): Phenolphthalein

Trade Secret Registry: Not applicable

National Inventories:

U.S. Inventory Status: All ingredients in this product are listed on the TSCA 8(b) Inventory (40 CFR 710).

TSCA CAS Number: Not applicable

16. OTHER INFORMATION

Intended Use: Indicator for pH

References: 29 CFR 1900 - 1910 (Code of Federal Regulations - Labor). Air Contaminants, Federal Register, Vol. 54, No. 12. Thursday, January 19, 1989. pp. 2332-2983. TLV's Threshold Limit Values and Biological Exposure Indices for 1992-1993. American Conference of Governmental Industrial Hygienists, 1992.

Technical Judgment. Journal of Clinical Investigations 41: 710-714 (1962). Acta Anat. 74: 121-124 (1969).

Fire Protection Guide on Hazardous Materials, 10th Ed. Quincy, MA: National Fire Protection Fire Protection Guide on Hazardous Materials, 10th Ed. Quincy, MA: National Fire Protection Association, 1991. In-house information.

Revision Summary: Updates in Section(s) 14,

Legend:

NA - Not Applicable	w/w - weight/weight
ND - Not Determined	w/v - weight/volume
NV - Not Available	v/v - volume/volume

USER RESPONSIBILITY: Each user should read and understand this information and incorporate it in individual site safety programs in accordance with applicable hazard communication standards and regulations.

THE INFORMATION CONTAINED HEREIN IS BASED ON DATA CONSIDERED TO BE ACCURATE. HOWEVER, NO WARRANTY IS EXPRESSED OR IMPLIED REGARDING THE ACCURACY OF THESE DATA OR THE RESULTS TO BE OBTAINED FROM THE USE THEREOF.

HACH COMPANY ©2007

World Headquarters
Hach Company
P.O.Box 389
Loveland, CO USA 80539
(970) 669-3050

MSDS No: M00009

MATERIAL SAFETY DATA SHEET

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Name: Bromcresol Green-Methyl Red Indicator Powder
Catalog Number: 94399

Hach Company
P.O.Box 389
Loveland, CO USA 80539
(970) 669-3050

Emergency Telephone Numbers:
(Medical and Transportation)
(303) 623-5716 24 Hour Service
(515)232-2533 8am - 4pm CST

MSDS Number: M00009
Chemical Name: Not applicable
CAS No.: Not applicable
Chemical Formula: Not applicable
Chemical Family: Not applicable
Hazard: May cause irritation.
Date of MSDS Preparation:
Day: 30
Month: September
Year: 2005

2. COMPOSITION / INFORMATION ON INGREDIENTS

Other components, each

CAS No.: Not applicable
TSCA CAS Number: Not applicable
Percent Range: < 1.0
Percent Range Units: weight / weight
LD50: Not applicable
LC50: Not applicable
TLV: Not established
PEL: Not established
Hazard: Any ingredient(s) of this product listed as "Other component(s)" is not considered a health hazard to the user of this product.

Potassium Chloride

CAS No.: 7447-40-7
TSCA CAS Number: 7447-40-7
Percent Range: >98
Percent Range Units: weight / weight
LD50: Oral rat LD₅₀ = 2600 mg/kg
LC50: None reported.
TLV: Not established.
PEL: Not established.
Hazard: May cause irritation.

3. HAZARDS IDENTIFICATION

Emergency Overview:
Appearance: Red-brown to green powder
Odor: None

MAY CAUSE EYE, SKIN AND RESPIRATORY TRACT IRRITATION

HMIS:

Health: 1

Flammability: 0

Reactivity: 0

Protective Equipment: X - See protective equipment, Section 8.

NFPA:

Health: 1

Flammability: 0

Reactivity: 0

Symbol: Not applicable

Potential Health Effects:

Eye Contact: May cause irritation

Skin Contact: May cause irritation

Skin Absorption: No effects anticipated

Target Organs: Not applicable

Ingestion: May cause: gastrointestinal disturbances blood pressure changes cardiac depression gastroenteritis

Target Organs: None reported

Inhalation: May cause: irritation of nose and throat

Target Organs: None reported

Medical Conditions Aggravated: Pre-existing: Kidney conditions

Chronic Effects: None reported

Cancer / Reproductive Toxicity Information:

This product does NOT contain any OSHA listed carcinogens.

This product does NOT contain any IARC listed chemicals.

This product does NOT contain any NTP listed chemicals.

Additional Cancer / Reproductive Toxicity Information: None reported

Toxicologically Synergistic Products: None reported

4. FIRST AID

Eye Contact: Immediately flush eyes with water for 15 minutes. Call physician.

Skin Contact (First Aid): Wash skin with plenty of water. Call physician if irritation develops.

Ingestion (First Aid): Give large quantities of water. Call physician immediately.

Inhalation: Remove to fresh air.

5. FIRE FIGHTING MEASURES

Flammable Properties: Does not burn, but may melt in a fire, releasing toxic fumes.

Flash Point: Not applicable

Method: Not applicable

Flammability Limits:

Lower Explosion Limits: Not applicable

Upper Explosion Limits: Not applicable

Autoignition Temperature: Not determined

Hazardous Combustion Products: None reported

Fire / Explosion Hazards: None reported

Static Discharge: None reported.

Mechanical Impact: None reported

Extinguishing Media: Use media appropriate to surrounding fire conditions

Fire Fighting Instruction: As in any fire, wear self-contained breathing apparatus pressure-demand and full protective gear.

6. ACCIDENTAL RELEASE MEASURES

Spill Response Notice:

Only persons properly qualified to respond to an emergency involving hazardous substances may respond to a spill according to federal regulations (OSHA 29 CFR 1910.120(a)(v)) and per your company's emergency response plan and guidelines/procedures. See Section 13, Special Instructions for disposal assistance.

Containment Technique: Stop spilled material from being released to the environment.

Clean-up Technique: Sweep up material. Dilute with a large excess of water. Flush the spilled material to the drain with a large excess of water.

Evacuation Procedure: Evacuate as needed to perform spill clean-up. If conditions warrant, increase the size of the evacuation.

Special Instructions (for accidental release): Not applicable

304 EHS RQ (40 CFR 355): Not applicable

D.O.T. Emergency Response Guide Number: None

7. HANDLING / STORAGE

Handling: Avoid contact with eyes skin Do not breathe dust. Wash thoroughly after handling. Maintain general industrial hygiene practices when using this product.

Storage: Keep container tightly closed when not in use.

Flammability Class: Not applicable

8. EXPOSURE CONTROLS / PROTECTIVE EQUIPMENT

Engineering Controls: Maintain general industrial hygiene practices when using this product.

Personal Protective Equipment:

Eye Protection: safety glasses with top and side shields

Skin Protection: disposable latex gloves lab coat

Inhalation Protection: adequate ventilation

Precautionary Measures: Avoid contact with: eyes skin Do not breathe: dust Wash thoroughly after handling.

TLV: Not established

PEL: Not established

9. PHYSICAL / CHEMICAL PROPERTIES

Appearance: Red-brown to green powder

Physical State: Solid

Molecular Weight: Not applicable

Odor: None

pH: of 5% solution = 9.0

Vapor Pressure: Not applicable

Vapor Density (air = 1): Not applicable

Boiling Point: Not applicable

Melting Point: 181°C (358°F)

Specific Gravity (water = 1): 1.91

Evaporation Rate (water = 1): Not applicable

Volatile Organic Compounds Content: Not applicable

Partition Coefficient (n-octanol / water): Not determined

Solubility:

Water: Soluble

Acid: Soluble

Other: Not determined

Metal Corrosivity:

Steel: Not determined

Aluminum: Not determined

10. STABILITY / REACTIVITY

Chemical Stability: Stable when stored under proper conditions.

Conditions to Avoid: Extreme temperatures Excess moisture

Reactivity / Incompatibility: None reported

Hazardous Decomposition: Toxic fumes of: chlorides

Hazardous Polymerization: Will not occur.

11. TOXICOLOGICAL INFORMATION

Product Toxicological Data:

LD50: None reported

LC50: None reported

Dermal Toxicity Data: None reported

Skin and Eye Irritation Data: None reported

Mutation Data: None reported

Reproductive Effects Data: None reported

Ingredient Toxicological Data: Potassium Chloride: Oral rat LD₅₀ = 2600 mg/kg, Oral man LD_{Lo} = 20 mg/kg

12. ECOLOGICAL INFORMATION

Product Ecological Information: --

No ecological data available for this product.

Ingredient Ecological Information: --

No ecological data available for the ingredients of this product.

13. DISPOSAL CONSIDERATIONS

EPA Waste ID Number: None

Special Instructions (Disposal): Dilute material with excess water making a weaker than 5% solution. Open cold water tap completely, slowly pour the material to the drain. Flush system with plenty of water.

Empty Containers: Rinse three times with an appropriate solvent. Dispose of empty container as normal trash.

NOTICE (Disposal): These disposal guidelines are based on federal regulations and may be superseded by more stringent state or local requirements. Please consult your local environmental regulators for more information.

14. TRANSPORT INFORMATION

D.O.T.:

D.O.T. Proper Shipping Name: Not Currently Regulated

--

DOT Hazard Class: NA

DOT Subsidiary Risk: NA

DOT ID Number: NA

DOT Packing Group: NA

I.C.A.O.:

I.C.A.O. Proper Shipping Name: Not Currently Regulated

--

ICAO Hazard Class: NA

ICAO Subsidiary Risk: NA

ICAO ID Number: NA

ICAO Packing Group: NA

I.M.O.:

I.M.O. Proper Shipping Name: Not Currently Regulated

--

I.M.O. Hazard Class: NA

I.M.O. Subsidiary Risk: NA

I.M.O. ID Number: NA

I.M.O. Packing Group: NA

Additional Information: This product may be shipped as part of a chemical kit composed of various compatible dangerous goods for analytical or testing purposes. This kit would have the following classification:

Proper Shipping Name: Chemical Kit Hazard Class: 9 UN Number 3316.

15. REGULATORY INFORMATION

U.S. Federal Regulations:

O.S.H.A.: This product meets the criteria for a hazardous substance as defined in the Hazard Communication Standard. (29 CFR 1910.1200)

E.P.A.:

S.A.R.A. Title III Section 311/312 Categorization (40 CFR 370): Immediate (Acute) Health Hazard

S.A.R.A. Title III Section 313 (40 CFR 372): This product does NOT contain any chemical subject to the reporting requirements of Section 313 of Title III of SARA.

--

302 (EHS) TPQ (40 CFR 355): Not applicable

304 CERCLA RQ (40 CFR 302.4): Not applicable

304 EHS RQ (40 CFR 355): Not applicable

Clean Water Act (40 CFR 116.4): Not applicable

RCRA: Contains no RCRA regulated substances.

C.P.S.C.: Not applicable

State Regulations:

California Prop. 65: No Prop. 65 listed chemicals are present in this product.

Identification of Prop. 65 Ingredient(s): None

Trade Secret Registry: Not applicable

National Inventories:

U.S. Inventory Status: All ingredients in this product are listed on the TSCA 8(b) Inventory (40 CFR 710).

TSCA CAS Number: Not applicable

16. OTHER INFORMATION

Intended Use: Indicator for pH

References: 29 CFR 1900 - 1910 (Code of Federal Regulations - Labor). Air Contaminants, Federal Register, Vol. 54, No. 12. Thursday, January 19, 1989. pp. 2332-2983. TLV's Threshold Limit Values and Biological Exposure Indices for 1992-1993. American Conference of Governmental Industrial Hygienists, 1992. Technical Judgment. In-house information. Fire Protection Guide on Hazardous Materials, 10th Ed. Quincy, MA: National Fire Protection Fire Protection Guide on Hazardous Materials, 10th Ed. Quincy, MA: National Fire Protection Association, 1991.

Revision Summary: Updates in Section(s) 14,

Legend:

NA - Not Applicable	w/w - weight/weight
ND - Not Determined	w/v - weight/volume
NV - Not Available	v/v - volume/volume

USER RESPONSIBILITY: Each user should read and understand this information and incorporate it in individual site safety programs in accordance with applicable hazard communication standards and regulations.

THE INFORMATION CONTAINED HEREIN IS BASED ON DATA CONSIDERED TO BE ACCURATE. HOWEVER, NO WARRANTY IS EXPRESSED OR IMPLIED REGARDING THE ACCURACY OF THESE DATA OR THE RESULTS TO BE OBTAINED FROM THE USE THEREOF.

HACH COMPANY ©2007

World Headquarters
Hach Company
P.O.Box 389
Loveland, CO USA 80539
(970) 669-3050

MSDS No: M00554

MATERIAL SAFETY DATA SHEET

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Name: Sodium Hydroxide 3.636 ± 0.020 N
Catalog Number: 1438001

Hach Company
P.O.Box 389
Loveland, CO USA 80539
(970) 669-3050

Emergency Telephone Numbers:
(Medical and Transportation)
(303) 623-5716 24 Hour Service
(515)232-2533 8am - 4pm CST

MSDS Number: M00554
Chemical Name: Not applicable
CAS No.: Not applicable
Chemical Formula: Not applicable
Chemical Family: Not applicable
Hazard: Causes burns.
Date of MSDS Preparation:
Day: 07
Month: December
Year: 2001

2. COMPOSITION / INFORMATION ON INGREDIENTS

Sodium Hydroxide

CAS No.: 1310-73-2
TSCA CAS Number: 1310-73-2
Percent Range: 5.0 - 15.0
Percent Range Units: weight / weight
LD50: Oral rat LDLo = 500 mg/kg.
LC50: None reported
TLV: 2 mg/m³ Ceiling/STEL
PEL: 2 mg/m³
Hazard: Causes severe burns. Toxic.

Demineralized Water

CAS No.: 7732-18-5
TSCA CAS Number: 7732-18-5
Percent Range: 80.0 - 90.0
Percent Range Units: volume / volume
LD50: None reported
LC50: None reported
TLV: Not established
PEL: Not established
Hazard: No effects anticipated.

3. HAZARDS IDENTIFICATION

Emergency Overview:

Appearance: Clear, colorless liquid

Odor: None

CAUSES SEVERE BURNS HARMFUL IF SWALLOWED

HMIS:

Health: 3

Flammability: 0

Reactivity: 0

Protective Equipment: X - See protective equipment, Section 8.

NFPA:

Health: 3

Flammability: 0

Reactivity: 0

Symbol: Not applicable

Potential Health Effects:

Eye Contact: Causes severe burns

Skin Contact: Causes burns.

Skin Absorption: None reported

Target Organs: None reported

Ingestion: Toxic Causes: severe burns Can cause: rapid pulse and respirations vomiting shock collapse

Target Organs: None reported

Inhalation: Causes: burns

Target Organs: None reported

Medical Conditions Aggravated: Pre-existing: Eye conditions Skin conditions Respiratory conditions

Chronic Effects: None reported

Cancer / Reproductive Toxicity Information:

This product does NOT contain any OSHA listed carcinogens.

This product does NOT contain any IARC listed chemicals.

This product does NOT contain any NTP listed chemicals.

Additional Cancer / Reproductive Toxicity Information: None reported

Toxicologically Synergistic Products: None reported

4. FIRST AID

Eye Contact: Immediately flush eyes with water for 15 minutes. Call physician.

Skin Contact (First Aid): Wash skin with plenty of water for 15 minutes. Remove contaminated clothing. Call physician immediately.

Ingestion (First Aid): Do not induce vomiting. Give 1-2 glasses of water. Call physician immediately. Never give anything by mouth to an unconscious person.

Inhalation: Remove to fresh air. Give artificial respiration if necessary. Call physician.

5. FIRE FIGHTING MEASURES

Flammable Properties: Material will not burn.

Flash Point: Not applicable

Method: Not applicable

Flammability Limits:

Lower Explosion Limits: Not applicable

Upper Explosion Limits: Not applicable

Autoignition Temperature: Not applicable

Hazardous Combustion Products: None reported

Fire / Explosion Hazards: May react violently with: strong acids flammable liquids organic materials

Static Discharge: None reported.

Mechanical Impact: None reported

Extinguishing Media: Use media appropriate to surrounding fire conditions

Fire Fighting Instruction: As in any fire, wear self-contained breathing apparatus pressure-demand and full protective gear.

6. ACCIDENTAL RELEASE MEASURES

Spill Response Notice:

Only persons properly qualified to respond to an emergency involving hazardous substances may respond to a spill according to federal regulations (OSHA 29 CFR 1910.120(a)(v)) and per your company's emergency response plan and guidelines/procedures. See Section 13, Special Instructions for disposal assistance.

Containment Technique: Releases of this material may contaminate the environment. Absorb spilled liquid with non-reactive sorbent material. Stop spilled material from being released to the environment. Dike the spill to contain material for later disposal.

Clean-up Technique: Cover spilled material with a dry acid, such as citric or boric. Scoop up slurry into a large beaker. Adjust to a pH between 6 and 9 with an acid, such as sulfuric or citric. Flush reacted material to the drain with a large excess of water. Decontaminate the area of the spill with a weak acid solution.

Evacuation Procedure: Evacuate local area (15 foot radius or as directed by your facility's emergency response plan) when: any quantity is spilled. If conditions warrant, increase the size of the evacuation.

Special Instructions (for accidental release): Mixture contains a component which is regulated as hazardous waste. Mixture contains a component which is regulated as a water pollutant.

304 EHS RQ (40 CFR 355): Not applicable

D.O.T. Emergency Response Guide Number: 154

7. HANDLING / STORAGE

Handling: Avoid contact with eyes skin clothing Do not breathe mist or vapors. Wash thoroughly after handling. Maintain general industrial hygiene practices when using this product.

Storage: Keep away from: acids flammable liquids organic material Store in a cool, dry place.

Flammability Class: Not applicable

8. EXPOSURE CONTROLS / PROTECTIVE EQUIPMENT

Engineering Controls: Have an eyewash station nearby. Have a safety shower nearby. Maintain general industrial hygiene practices when using this product.

Personal Protective Equipment:

Eye Protection: chemical splash goggles

Skin Protection: disposable latex gloves lab coat

Inhalation Protection: adequate ventilation

Precautionary Measures: Avoid contact with: eyes skin clothing Do not breathe: mist/vapor Wash thoroughly after handling. Keep away from: acids/acid fumes organic materials

TLV: Not established

PEL: Not established

9. PHYSICAL / CHEMICAL PROPERTIES

Appearance: Clear, colorless liquid

Physical State: Liquid

Molecular Weight: Not applicable

Odor: None

pH: >14
Vapor Pressure: Not determined
Vapor Density (air = 1): Not determined
Boiling Point: ~100°C (212°F)
Melting Point: Not determined
Specific Gravity (water = 1): 1.136
Evaporation Rate (water = 1): 0.26
Volatile Organic Compounds Content: Not applicable
Partition Coefficient (n-octanol / water): Not applicable
Solubility:
 Water: Soluble
 Acid: Soluble
 Other: Not determined
Metal Corrosivity:
 Steel: 0.00 in/yr
 Aluminum: >20 in/yr

10. STABILITY / REACTIVITY

Chemical Stability: Stable when stored under proper conditions.
Conditions to Avoid: Heat Evaporation Extreme temperatures
Reactivity / Incompatibility: May react violently in contact with: strong acids flammable liquids aluminum tin zinc nitromethane nitro compounds halogenated organic compounds
Hazardous Decomposition: None reported
Hazardous Polymerization: Will not occur.

11. TOXICOLOGICAL INFORMATION

Product Toxicological Data:
 LD50: None reported
 LC50: None reported
Dermal Toxicity Data: None reported
Skin and Eye Irritation Data: None reported
Mutation Data: None reported
Reproductive Effects Data: None reported
Ingredient Toxicological Data: Sodium Hydroxide: Oral rat LD_{Lo} = 500 mg/kg

12. ECOLOGICAL INFORMATION

Product Ecological Information: --
No ecological data available for this product.
Ingredient Ecological Information: --
No ecological data available for the ingredients of this product.

13. DISPOSAL CONSIDERATIONS

EPA Waste ID Number: D002
Special Instructions (Disposal): Dilute to 3 to 5 times the volume with cold water. Adjust to a pH between 6 and 9 with an acid, such as sulfuric or citric. Open cold water tap completely, slowly pour the reacted material to the drain. Flush system with plenty of water.
Empty Containers: Rinse three times with an appropriate solvent. Dispose of empty container as normal trash.

NOTICE (Disposal): These disposal guidelines are based on federal regulations and may be superseded by more stringent state or local requirements. Please consult your local environmental regulators for more information.

14. TRANSPORT INFORMATION

D.O.T.:

D.O.T. Proper Shipping Name: Sodium Hydroxide Solution

--

DOT Hazard Class: 8

DOT Subsidiary Risk: NA

DOT ID Number: UN1824

DOT Packing Group: II

I.C.A.O.:

I.C.A.O. Proper Shipping Name: Sodium Hydroxide Solution

--

ICAO Hazard Class: 8

ICAO Subsidiary Risk: NA

ICAO ID Number: UN1824

ICAO Packing Group: II

I.M.O.:

I.M.O. Proper Shipping Name: Sodium Hydroxide Solution

--

I.M.O. Hazard Class: 8

I.M.O. Subsidiary Risk: NA

I.M.O. ID Number: UN1824

I.M.O. Packing Group: II

Additional Information: This product may be shipped as part of a chemical kit composed of various compatible dangerous goods for analytical or testing purposes. This kit would have the following classification: Proper Shipping Name: Chemical Kit
Hazard Class: 9 UN Number 3316.

15. REGULATORY INFORMATION

U.S. Federal Regulations:

O.S.H.A.: This product meets the criteria for a hazardous substance as defined in the Hazard Communication Standard. (29 CFR 1910.1200)

E.P.A.:

S.A.R.A. Title III Section 311/312 Categorization (40 CFR 370): Immediate (Acute) Health Hazard

S.A.R.A. Title III Section 313 (40 CFR 372): This product does NOT contain any chemical subject to the reporting requirements of Section 313 of Title III of SARA.

--

302 (EHS) TPQ (40 CFR 355): Not applicable

304 CERCLA RQ (40 CFR 302.4): Sodium Hydroxide

304 EHS RQ (40 CFR 355): Not applicable

Clean Water Act (40 CFR 116.4): Sodium Hydroxide - RQ = 1000 lbs. (454 kgs.)

RCRA: Contains RCRA regulated substances. See Section 13, EPA Waste ID Number.

C.P.S.C.: The label for this product bears the signal word "POISON" because the concentration of Sodium Hydroxide in the product is greater than/equal to 10%.

State Regulations:

California Prop. 65: No Prop. 65 listed chemicals are present in this product.

Identification of Prop. 65 Ingredient(s): None

Trade Secret Registry: Not applicable

National Inventories:

U.S. Inventory Status: All ingredients in this product are listed on the TSCA 8(b) Inventory (40 CFR 710).

TSCA CAS Number: Not applicable

16. OTHER INFORMATION

Intended Use: Laboratory Reagent

References: 29 CFR 1900 - 1910 (Code of Federal Regulations - Labor). Air Contaminants, Federal Register, Vol. 54, No. 12. Thursday, January 19, 1989. pp. 2332-2983. TLV's Threshold Limit Values and Biological Exposure Indices for 1992-1993. American Conference of Governmental Industrial Hygienists, 1992. Technical Judgment. In-house information. Fire Protection Guide on Hazardous Materials, 10th Ed. Quincy, MA: National Fire Protection Fire Protection Guide on Hazardous Materials, 10th Ed. Quincy, MA: National Fire Protection Association, 1991. Sax, N. Irving. Dangerous Properties of Industrial Materials, 7th Ed. New York: Van Nostrand Reinhold Co., 1989.

Revision Summary: Updates in Section(s) 14,

Legend:

NA - Not Applicable	w/w - weight/weight
ND - Not Determined	w/v - weight/volume
NV - Not Available	v/v - volume/volume

USER RESPONSIBILITY: Each user should read and understand this information and incorporate it in individual site safety programs in accordance with applicable hazard communication standards and regulations.

THE INFORMATION CONTAINED HEREIN IS BASED ON DATA CONSIDERED TO BE ACCURATE. HOWEVER, NO WARRANTY IS EXPRESSED OR IMPLIED REGARDING THE ACCURACY OF THESE DATA OR THE RESULTS TO BE OBTAINED FROM THE USE THEREOF.

HACH COMPANY ©2007

World Headquarters
Hach Company
P.O.Box 389
Loveland, CO USA 80539
(970) 669-3050

MSDS No: M00029

MATERIAL SAFETY DATA SHEET

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Name: Dissolved Oxygen 1 Reagent
Catalog Number: 98199

Hach Company
P.O.Box 389
Loveland, CO USA 80539
(970) 669-3050

Emergency Telephone Numbers:
(Medical and Transportation)
(303) 623-5716 24 Hour Service
(515)232-2533 8am - 4pm CST

MSDS Number: M00029

Chemical Name: Sulfuric acid, manganese(2+) salt (1:1)

CAS No.: 7785-87-7

Chemical Formula: MnSO₄

Chemical Family: Inorganic Salt

Hazard: May cause irritation. Cumulative poison. Experimental mutagen. Experimental teratogen.

Date of MSDS Preparation:

Day: 05

Month: October

Year: 2006

2. COMPOSITION / INFORMATION ON INGREDIENTS

Manganous Sulfate

CAS No.: 7785-87-7

TSCA CAS Number: 7785-87-7

Percent Range: 100.0

Percent Range Units: weight / weight

LD50: None reported

LC50: None reported

TLV: 0.2 mg/m³ (Mn)

PEL: Ceiling: 5 mg/m³ (Mn)

Hazard: May cause irritation. Cumulative poison. Experimental mutagen. Experimental teratogen.

3. HAZARDS IDENTIFICATION

Emergency Overview:

Appearance: Pink powder

Odor: Not determined

HARMFUL IF INHALED MAY CAUSE EYE, SKIN AND RESPIRATORY TRACT IRRITATION

HMIS:

Health: 2

Flammability: 0

Reactivity: 1

Protective Equipment: X - See protective equipment, Section 8.

NFPA:

Health: 2

Flammability: 0

Reactivity: 1

Symbol: Not applicable

Potential Health Effects:

Eye Contact: May cause irritation

Skin Contact: May cause irritation

Skin Absorption: No effects anticipated

Target Organs: Not applicable

Ingestion: Very large doses may cause: gastrointestinal irritation nausea

Target Organs: None reported

Inhalation: May cause: respiratory tract irritation pneumonitis

Target Organs: Lungs

Medical Conditions Aggravated: Pre-existing: Respiratory conditions Central nervous system diseases
Liver conditions

Chronic Effects: Chronic inhalation of manganese (or Mn compounds) may cause psychiatric disorders characterized by irritability, difficulty walking, speech disturbances, and compulsive behavior. If the conditions persist, manganese poisoning may cause a mask-like facial expression, symptoms similar to Parkinson's disease, and cirrhosis of the liver.

Cancer / Reproductive Toxicity Information:

O.S.H.A. Listed: No

IARC Listed: No

NTP Listed: No

Additional Cancer / Reproductive Toxicity Information: Contains: an experimental mutagen. an experimental teratogen.

Toxicologically Synergistic Products: None reported

4. FIRST AID

Eye Contact: Immediately flush eyes with water for 15 minutes. Call physician.

Skin Contact (First Aid): Wash skin with plenty of water. Call physician if irritation develops.

Ingestion (First Aid): Give 1-2 glasses of water. Induce vomiting using syrup of ipecac or by sticking finger down throat. Never give anything by mouth to an unconscious person. Call physician immediately.

Inhalation: Remove to fresh air. Give artificial respiration if necessary. Call physician.

5. FIRE FIGHTING MEASURES

Flammable Properties: During a fire, corrosive and toxic gases may be generated by thermal decomposition.

Flash Point: Not applicable

Method: Not applicable

Flammability Limits:

Lower Explosion Limits: Not applicable

Upper Explosion Limits: Not applicable

Autoignition Temperature: Not determined

Hazardous Combustion Products: This material will not burn.

Fire / Explosion Hazards: None reported

Static Discharge: None reported.

Mechanical Impact: None reported

Extinguishing Media: Use media appropriate to surrounding fire conditions

Fire Fighting Instruction: As in any fire, wear self-contained breathing apparatus pressure-demand and full protective gear. Evacuate area and fight fire from a safe distance.

6. ACCIDENTAL RELEASE MEASURES

Spill Response Notice:

Only persons properly qualified to respond to an emergency involving hazardous substances may respond to a spill according to federal regulations (OSHA 29 CFR 1910.120(a)(v)) and per your company's emergency response plan and guidelines/procedures. See Section 13, Special Instructions for disposal assistance.

Containment Technique: Stop spilled material from being released to the environment.

Clean-up Technique: Scoop up spilled material into a large beaker and dissolve with water. Adjust to a pH between 6 and 9 with an alkali, such as soda ash or sodium bicarbonate. Flush reacted material to the drain with a large excess of water. Decontaminate the area of the spill with a soap solution.

Evacuation Procedure: Evacuate local area (15 foot radius or as directed by your facility's emergency response plan) when: a pound or more of loose powder is spilled. If conditions warrant, increase the size of the evacuation.

Special Instructions (for accidental release): Product is regulated as a hazardous air pollutant.

304 EHS RQ (40 CFR 355): Not applicable

D.O.T. Emergency Response Guide Number: Not applicable

7. HANDLING / STORAGE

Handling: Avoid contact with eyes skin Do not breathe dust. Wash thoroughly after handling. Use with adequate ventilation. Maintain general industrial hygiene practices when using this product.

Storage: Store at 10 - 30°C. Keep away from: oxidizers powdered metals

Flammability Class: Not applicable

8. EXPOSURE CONTROLS / PROTECTIVE EQUIPMENT

Engineering Controls: Have an eyewash station nearby. Have a safety shower nearby. Maintain adequate ventilation to keep vapor level below TWA for chemicals in this product. Maintain general industrial hygiene practices when using this product.

Personal Protective Equipment:

Eye Protection: safety glasses with top and side shields

Skin Protection: disposable latex gloves

Inhalation Protection: adequate ventilation

Precautionary Measures: Avoid contact with: eyes skin Do not breathe: dust Wash thoroughly after handling. Use with adequate ventilation. Keep away from: oxidizers powdered metals

TLV: 0.2 mg/m³ (Mn)

PEL: Ceiling: 5 mg/m³ (Mn)

9. PHYSICAL / CHEMICAL PROPERTIES

Appearance: Pink powder

Physical State: Solid

Molecular Weight: 151.01

Odor: Not determined

pH: 3.7 (5% sol'n)

Vapor Pressure: Not applicable

Vapor Density (air = 1): Not applicable

Boiling Point: Not determined

Melting Point: > 400°C (> 752°F)

Specific Gravity (water = 1): 3.25

Evaporation Rate (water = 1): Not applicable

Volatile Organic Compounds Content: Not applicable

Partition Coefficient (n-octanol / water): Not applicable

Solubility:

Water: Soluble

Acid: Not determined

Other: Insoluble in alcohol

Metal Corrosivity:

Steel: Not determined

Aluminum: 0.002 in/yr (0.051 mm/yr)

10. STABILITY / REACTIVITY

Chemical Stability: Stable when stored under proper conditions.

Conditions to Avoid: Extreme temperatures Heating to decomposition.

Reactivity / Incompatibility: Incompatible with: oxidizers powdered metals

Hazardous Decomposition: Heating to decomposition releases toxic and/or corrosive fumes of: sulfur oxides manganese oxides

Hazardous Polymerization: Will not occur.

11. TOXICOLOGICAL INFORMATION

Product Toxicological Data:

LD50: None reported

LC50: None reported

Dermal Toxicity Data: None reported

Skin and Eye Irritation Data: None reported

Mutation Data: Oral mouse sperm morphology @ 513 mg/kg/5D (Continuous); Hamster ovary cytogenetic analysis @ 180 mg/l; Hamster ovary sister chromatid exchange @ 5 mg/l; more data reported in RTECS.

Reproductive Effects Data: Oral mouse TDLo = 513 mg/kg (Paternal effects - spermatogenesis).

Ingredient Toxicological Data: --

Not applicable

12. ECOLOGICAL INFORMATION

Product Ecological Information: --

No ecological data available for this product.

Ingredient Ecological Information: --

Not applicable

13. DISPOSAL CONSIDERATIONS

EPA Waste ID Number: Not applicable

Special Instructions (Disposal): Dilute to 3 to 5 times the volume with cold water. Adjust to a pH between 6 and 9 with an alkali, such as soda ash or sodium bicarbonate. Open cold water tap completely, slowly pour the material to the drain. Flush system with plenty of water.

Empty Containers: Rinse three times with an appropriate solvent. Dispose of empty container as normal trash.

NOTICE (Disposal): These disposal guidelines are based on federal regulations and may be superseded by more stringent state or local requirements. Please consult your local environmental regulators for more information.

14. TRANSPORT INFORMATION

D.O.T.:

D.O.T. Proper Shipping Name: Not Currently Regulated

--

DOT Hazard Class: NA

DOT Subsidiary Risk: NA

DOT ID Number: NA

DOT Packing Group: NA

I.C.A.O.:

I.C.A.O. Proper Shipping Name: Not Currently Regulated

--

ICAO Hazard Class: NA

ICAO Subsidiary Risk: NA

ICAO ID Number: NA

ICAO Packing Group: NA

I.M.O.:

I.M.O. Proper Shipping Name: Not Currently Regulated

--

I.M.O. Hazard Class: NA

I.M.O. Subsidiary Risk: NA

I.M.O. ID Number: NA

I.M.O. Packing Group: NA

Additional Information: This product may be shipped as part of a chemical kit composed of various compatible dangerous goods for analytical or testing purposes. This kit would have the following classification:

Hazard Class: 9 UN Number 3316.

Proper Shipping Name: Chemical Kit

declares this product an environmental hazard by Special Provision 909 (IMDG) and Special Provision A97 (IATA) the classification may be UN3077 or UN3082.

ALSO NOTE: If the National Competent Authority

15. REGULATORY INFORMATION

U.S. Federal Regulations:

O.S.H.A.: This product meets the criteria for a hazardous substance as defined in the Hazard Communication Standard. (29 CFR 1910.1200)

E.P.A.:

S.A.R.A. Title III Section 311/312 Categorization (40 CFR 370): Immediate (Acute) Health Hazard
Delayed (Chronic) Health Hazard

S.A.R.A. Title III Section 313 (40 CFR 372): This product contains a chemical(s) subject to the reporting requirements of Section 313 of Title III of SARA.

Manganese compounds

302 (EHS) TPQ (40 CFR 355): Not applicable

304 CERCLA RQ (40 CFR 302.4): Manganese Compounds 1 lb.

304 EHS RQ (40 CFR 355): Not applicable

Clean Water Act (40 CFR 116.4): Not applicable

RCRA: Contains no RCRA regulated substances.

C.P.S.C.: Not applicable

State Regulations:

California Prop. 65: No Prop. 65 listed chemicals are present in this product.

Identification of Prop. 65 Ingredient(s): None

Trade Secret Registry: Not applicable

National Inventories:

U.S. Inventory Status: TSCA Listed: Yes

TSCA CAS Number: 7785-87-7

16. OTHER INFORMATION

Intended Use: Laboratory Reagent

References: 29 CFR 1900 - 1910 (Code of Federal Regulations - Labor). Air Contaminants, Federal Register, Vol. 54, No. 12. Thursday, January 19, 1989. pp. 2332-2983. CCINFO RTECS. Canadian Centre for Occupational Health and Safety. Hamilton, Ontario Canada: 30 June 1993. Fire Protection Guide on Hazardous Materials, 10th Ed. Quincy, MA: National Fire Protection Fire Protection Guide on Hazardous Materials, 10th Ed. Quincy, MA: National Fire Protection Association, 1991. Cassaret and Doull's Toxicology, 3rd Ed. New York: Macmillan Publishing Co., Inc., 1986. List of Dangerous Substances Classified in Annex I of the EEC Directive (67/548) - Classification, Packaging and Labeling of Dangerous Substances, Amended July 1992. Technical Judgment. TLV's Threshold Limit Values and Biological Exposure Indices for 1992-1993. American Conference of Governmental Industrial Hygienists, 1992. Vendor Information.

Revision Summary: Updates in Section(s) 14,

Legend:

NA - Not Applicable	w/w - weight/weight
ND - Not Determined	w/v - weight/volume
NV - Not Available	v/v - volume/volume

USER RESPONSIBILITY: Each user should read and understand this information and incorporate it in individual site safety programs in accordance with applicable hazard communication standards and regulations.

THE INFORMATION CONTAINED HEREIN IS BASED ON DATA CONSIDERED TO BE ACCURATE. HOWEVER, NO WARRANTY IS EXPRESSED OR IMPLIED REGARDING THE ACCURACY OF THESE DATA OR THE RESULTS TO BE OBTAINED FROM THE USE THEREOF.

HACH COMPANY ©2007

World Headquarters
Hach Company
P.O.Box 389
Loveland, CO USA 80539
(970) 669-3050

MSDS No: M00028

MATERIAL SAFETY DATA SHEET

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Name: Dissolved Oxygen 2 Reagent
Catalog Number: 98299

Hach Company
P.O.Box 389
Loveland, CO USA 80539
(970) 669-3050

Emergency Telephone Numbers:
(Medical and Transportation)
(303) 623-5716 24 Hour Service
(515)232-2533 8am - 4pm CST

MSDS Number: M00028
Chemical Name: Not applicable
CAS No.: Not applicable
Chemical Formula: Not applicable
Chemical Family: Not applicable
Hazard: Toxic. Causes severe burns.
Date of MSDS Preparation:
Day: 05
Month: December
Year: 2007

2. COMPOSITION / INFORMATION ON INGREDIENTS

Potassium Iodide

CAS No.: 7681-11-0
TSCA CAS Number: 7681-11-0
Percent Range: 30.0 - 40.0
Percent Range Units: weight / weight
LD50: Oral Mouse LD50 = 1862 mg/kg
LC50: None reported
TLV: Not established
PEL: Not established
Hazard: Causes irritation.

Lithium Hydroxide

CAS No.: 1310-65-2
TSCA CAS Number: 1310-65-2
Percent Range: 55.0 - 65.0
Percent Range Units: weight / weight
LD50: Oral rat LD50 = 225 mg/kg
LC50: Inhalation rat LC50 = 980 mg/m³/4H
TLV: 3mg/m³ Respirable Particles; 10 mg/m³ Inhalable particles
PEL: 5 mg/m³ Respirable Fraction; 15 mg/m³ Total Dust
Hazard: Toxic. Causes severe burns.

Sodium Azide

CAS No.: 26628-22-8

TSCA CAS Number: 26628-22-8

Percent Range: 1.0 - 5.0

Percent Range Units: weight / weight

LD50: Oral rat LD₅₀ = 27 mg/kg; Oral mouse LD₅₀ = 27 mg/kg.

LC50: None reported

TLV: C: 0.29 mg/m³ as Sodium azide; C 0.11 ppm as Hydrazoic acid vapor

PEL: Not established

Hazard: Highly toxic. May cause irritation. Cumulative poison. Experimental mutagen. Explosive. Contact with acid may generate toxic fumes.

3. HAZARDS IDENTIFICATION

Emergency Overview:

Appearance: White crystals

Odor: None

CAUSES SEVERE BURNS HARMFUL IF SWALLOWED, INHALED OR ABSORBED THROUGH SKIN

HMIS:

Health: 3

Flammability: 1

Reactivity: 1

Protective Equipment: X - See protective equipment, Section 8.

NFPA:

Health: 3

Flammability: 1

Reactivity: 1

Symbol: Not applicable

Potential Health Effects:

Eye Contact: Causes severe burns

Skin Contact: Causes severe burns

Skin Absorption: Toxic. Effects similar to those of ingestion

Target Organs: Central nervous system

Ingestion: Toxic Causes: severe burns hypotension May cause iodism, which symptoms include skin rash, conjunctivitis, runny nose, sneezing, bronchitis, headache, fever and irritation of mucous membranes. May cause: abdominal pain dizziness nausea vomiting respiratory stimulation convulsions followed by respiratory depression central nervous system effects kidney damage liver damage spleen damage lung damage coma death

Target Organs: Central nervous system Bone marrow Kidneys Liver Spleen Lungs

Inhalation: Causes: severe burns May cause: coughing shortness of breath bronchitis headache dizziness weakness respiratory stimulation convulsions followed by respiratory depression death

Target Organs: None reported

Medical Conditions Aggravated: Sodium azide produces a larger blood pressure drop in persons with high blood pressure than in persons with normal blood pressure. Pre-existing: Eye conditions Skin conditions Respiratory conditions Kidney conditions Liver conditions

Chronic Effects: Lithium compounds have been implicated in development of aplastic anemia. Signs of lithium poisoning include dehydration, extreme weight loss, fine tremor of hands, nausea, vomiting and diarrhea, Chronic overexposure may cause headache central nervous system effects kidney damage liver damage

Cancer / Reproductive Toxicity Information:

This product does NOT contain any OSHA listed carcinogens.

This product does NOT contain any IARC listed chemicals.

This product does NOT contain any NTP listed chemicals.

Additional Cancer / Reproductive Toxicity Information: Contains: an experimental mutagen. an experimental teratogen.

Toxicologically Synergistic Products: None reported

4. FIRST AID

Eye Contact: Immediately flush eyes with water for 15 minutes. Call physician.

Skin Contact (First Aid): Wash skin with plenty of water for 15 minutes. Remove contaminated clothing. Call physician immediately.

Ingestion (First Aid): Do not induce vomiting. Give 1-2 glasses of water. Never give anything by mouth to an unconscious person. Call physician immediately.

Inhalation: Remove to fresh air. Give artificial respiration if necessary. Call physician.

5. FIRE FIGHTING MEASURES

Flammable Properties: Does not burn, but may melt in a fire, releasing toxic fumes. During a fire, corrosive and toxic gases may be generated by thermal decomposition.

Flash Point: Not applicable

Method: Not applicable

Flammability Limits:

Lower Explosion Limits: Not applicable

Upper Explosion Limits: Not applicable

Autoignition Temperature: Not determined

Hazardous Combustion Products: None reported

Fire / Explosion Hazards: Contact with metals gives off hydrogen gas which is flammable. Closed containers may explode if heated.

Static Discharge: None reported.

Mechanical Impact: None reported

Extinguishing Media: Carbon dioxide. Dry chemical. Water.

Fire Fighting Instruction: As in any fire, wear self-contained breathing apparatus pressure-demand and full protective gear. Evacuate area and fight fire from a safe distance.

6. ACCIDENTAL RELEASE MEASURES

Spill Response Notice:

Only persons properly qualified to respond to an emergency involving hazardous substances may respond to a spill according to federal regulations (OSHA 29 CFR 1910.120(a)(v)) and per your company's emergency response plan and guidelines/procedures. See Section 13, Special Instructions for disposal assistance.

Containment Technique: Stop spilled material from being released to the environment.

Clean-up Technique: Avoid contact with spilled material. Sweep up material. Dispose of material in an E.P.A. approved hazardous waste facility. Decontaminate the area of the spill with a weak acid solution.

Evacuation Procedure: Evacuate general area (50 foot radius or as directed by your facility's emergency response plan) when: a pound or more of loose powder is spilled. If conditions warrant, increase the size of the evacuation.

Special Instructions (for accidental release): Mixture contains a component which is regulated as hazardous waste.

304 EHS RQ (40 CFR 355): Sodium Azide - RQ 1000 lbs.

D.O.T. Emergency Response Guide Number: 154

7. HANDLING / STORAGE

Handling: Avoid contact with eyes skin clothing Do not breathe dust. Wash thoroughly after handling. Use with adequate ventilation. Maintain general industrial hygiene practices when using this product.

Storage: Store in a cool, dry place. Keep away from: metals acids / acid fumes.

Flammability Class: Not applicable

8. EXPOSURE CONTROLS / PROTECTIVE EQUIPMENT

Engineering Controls: Have an eyewash station nearby. Have a safety shower nearby. Use a fume hood to avoid exposure to dust, mist or vapor. Maintain general industrial hygiene practices when using this product.

Personal Protective Equipment:

Eye Protection: chemical splash goggles

Skin Protection: disposable latex gloves lab coat

Inhalation Protection: laboratory fume hood

Precautionary Measures: Avoid contact with: eyes skin clothing Do not breathe: dust Wash thoroughly after handling. Keep away from: metals acids/acid fumes

TLV: Not established

PEL: Not established

9. PHYSICAL / CHEMICAL PROPERTIES

Appearance: White crystals

Physical State: Solid

Molecular Weight: Not applicable

Odor: None

pH: 12.6 (5% sol'n)

Vapor Pressure: Not applicable

Vapor Density (air = 1): Not applicable

Boiling Point: Not applicable

Melting Point: 110°C (230°F)

Specific Gravity (water = 1): 1.94

Evaporation Rate (water = 1): Not applicable

Volatile Organic Compounds Content: Not applicable

Partition Coefficient (n-octanol / water): Not applicable

Solubility:

Water: Soluble

Acid: Not determined

Other: Not determined

Metal Corrosivity:

Steel: Not determined

Aluminum: 0.248 in/yr (6.30 mm/yr)

10. STABILITY / REACTIVITY

Chemical Stability: Stable when stored under proper conditions.

Conditions to Avoid: Excess moisture Extreme temperatures

Reactivity / Incompatibility: May react violently in contact with: acids oxidizers

Hazardous Decomposition: Heating to decomposition releases toxic and/or corrosive fumes of: iodine iodine compounds potassium oxide nitrogen oxides sodium oxides Contact with metals may release flammable hydrogen gas.

Hazardous Polymerization: Will not occur.

11. TOXICOLOGICAL INFORMATION

Product Toxicological Data:

LD50: Oral rat LD₅₀ = 350 mg/kg

LC50: None reported

Dermal Toxicity Data: None reported

Skin and Eye Irritation Data: None reported

Mutation Data: Sodium Azide: DNA inhibition in human fibroblasts @ 50 mg/l; other data reported in RTECS.

Reproductive Effects Data: None reported

Ingredient Toxicological Data: Lithium Hydroxide: Oral rat LD₅₀ = 225 mg/kg. Sodium Azide: Oral rat LD₅₀ = 27 mg/kg; Dermal rabbit LD₅₀ = 20 mg/kg.

12. ECOLOGICAL INFORMATION

Product Ecological Information: --

No ecological data available for this product.

Ingredient Ecological Information: --

No ecological data available for the ingredients of this product.

13. DISPOSAL CONSIDERATIONS

EPA Waste ID Number: D002

Special Instructions (Disposal): Never put unreacted azides down the drain! Dispose of material in an E.P.A. approved hazardous waste facility.

Empty Containers: Rinse three times with an appropriate solvent. Dispose of empty container as normal trash.

NOTICE (Disposal): These disposal guidelines are based on federal regulations and may be superseded by more stringent state or local requirements. Please consult your local environmental regulators for more information.

14. TRANSPORT INFORMATION

D.O.T.:

D.O.T. Proper Shipping Name: Lithium Hydroxide Mixture

--

DOT Hazard Class: 8

DOT Subsidiary Risk: NA

DOT ID Number: UN2680

DOT Packing Group: II

I.C.A.O.:

I.C.A.O. Proper Shipping Name: Lithium Hydroxide Mixture

--

ICAO Hazard Class: 8

ICAO Subsidiary Risk: NA

ICAO ID Number: UN2680

ICAO Packing Group: II

I.M.O.:

I.M.O. Proper Shipping Name: Lithium Hydroxide Mixture

--

I.M.O. Hazard Class: 8

I.M.O. Subsidiary Risk: NA

I.M.O. ID Number: UN2680

I.M.O. Packing Group: II

Additional Information: This product may be shipped as part of a chemical kit composed of various compatible dangerous goods for analytical or testing purposes. This kit would have the following

classification:
Hazard Class: 9 UN Number 3316.

Proper Shipping Name: Chemical Kit

15. REGULATORY INFORMATION

U.S. Federal Regulations:

O.S.H.A.: This product meets the criteria for a hazardous substance as defined in the Hazard Communication Standard. (29 CFR 1910.1200)

E.P.A.:

S.A.R.A. Title III Section 311/312 Categorization (40 CFR 370): Immediate (Acute) Health Hazard
Delayed (Chronic) Health Hazard

S.A.R.A. Title III Section 313 (40 CFR 372): This product contains a chemical(s) subject to the reporting requirements of Section 313 of Title III of SARA.

Sodium azide

302 (EHS) TPQ (40 CFR 355): Sodium Azide 500 lbs.

304 CERCLA RQ (40 CFR 302.4): Sodium azide 1000 lbs.

304 EHS RQ (40 CFR 355): Sodium Azide - RQ 1000 lbs.

Clean Water Act (40 CFR 116.4): Not applicable

RCRA: Contains RCRA regulated substances. See Section 13, EPA Waste ID Number.

C.P.S.C.: The label for this product bears the signal word "POISON" because the concentration of Lithium Hydroxide in the product is greater than/ equal to 10%

State Regulations:

California Prop. 65: No Prop. 65 listed chemicals are present in this product.

Identification of Prop. 65 Ingredient(s): None

Trade Secret Registry: Not applicable

National Inventories:

U.S. Inventory Status: All ingredients in this product are listed on the TSCA 8(b) Inventory (40 CFR 710).

TSCA CAS Number: Not applicable

16. OTHER INFORMATION

Intended Use: Determination of dissolved oxygen

References: 29 CFR 1900 - 1910 (Code of Federal Regulations - Labor). Air Contaminants, Federal Register, Vol. 54, No. 12. Thursday, January 19, 1989. pp. 2332-2983. CCINFO RTECS. Canadian Centre for Occupational Health and Safety. Hamilton, Ontario Canada: 30 June 1993. Fire Protection Guide on Hazardous Materials, 10th Ed. Quincy, MA: National Fire Protection Fire Protection Guide on Hazardous Materials, 10th Ed. Quincy, MA: National Fire Protection Association, 1991. List of Dangerous Substances Classified in Annex I of the EEC Directive (67/548) - Classification, Packaging and Labeling of Dangerous Substances, Amended July 1992. Outside Testing. Technical Judgment.

Revision Summary: Updates in Section(s) 14,

Legend:

NA - Not Applicable	w/w - weight/weight
ND - Not Determined	w/v - weight/volume
NV - Not Available	v/v - volume/volume

USER RESPONSIBILITY: Each user should read and understand this information and incorporate it in individual site safety programs in accordance with applicable hazard communication standards and regulations.

THE INFORMATION CONTAINED HEREIN IS BASED ON DATA CONSIDERED TO BE ACCURATE. HOWEVER, NO WARRANTY IS EXPRESSED OR IMPLIED REGARDING THE ACCURACY OF THESE DATA OR THE RESULTS TO BE OBTAINED FROM THE USE THEREOF.

HACH COMPANY ©2007

World Headquarters
Hach Company
P.O.Box 389
Loveland, CO USA 80539
(970) 669-3050

MSDS No: M00007

MATERIAL SAFETY DATA SHEET

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Name: Dissolved Oxygen 3 Powder Pillows
Catalog Number: 98799

Hach Company
P.O.Box 389
Loveland, CO USA 80539
(970) 669-3050

Emergency Telephone Numbers:
(Medical and Transportation)
(303) 623-5716 24 Hour Service
(515)232-2533 8am - 4pm CST

MSDS Number: M00007
Chemical Name: Sulfamic Acid
CAS No.: 5329-14-6
Chemical Formula: H₃NO₃S
Chemical Family: Inorganic Acid
Hazard: Causes eye burns.
Date of MSDS Preparation:
Day: 09
Month: July
Year: 2007

2. COMPOSITION / INFORMATION ON INGREDIENTS

Other component

CAS No.: Not applicable
TSCA CAS Number: Not applicable
Percent Range: < 1.0
Percent Range Units: weight / weight
LD50: Not applicable
LC50: Not applicable
TLV: Not established
PEL: Not established
Hazard: Any ingredient(s) of this product listed as "Other component(s)" is not considered a health hazard to the user of this product.

Sulfamic Acid

CAS No.: 5329-14-6
TSCA CAS Number: 5329-14-6
Percent Range: > 99.0
Percent Range Units: weight / weight
LD50: Oral rat LD50 = 3160 mg/kg.
LC50: None reported
TLV: Not established
PEL: Not established
Hazard: Causes eye burns.

3. HAZARDS IDENTIFICATION

Emergency Overview:

Appearance: White crystals

Odor: None

CAUSES EYE BURNS CAUSES SKIN AND RESPIRATORY TRACT IRRITATION

HMIS:

Health: 2

Flammability: 1

Reactivity: 1

Protective Equipment: X - See protective equipment, Section 8.

NFPA:

Health: 2

Flammability: 1

Reactivity: 1

Symbol: Not applicable

Potential Health Effects:

Eye Contact: Causes eye burns.

Skin Contact: Causes severe irritation

Skin Absorption: None reported

Target Organs: None reported

Ingestion: May cause: irritation of the mouth and esophagus gastrointestinal irritation

Target Organs: None reported

Inhalation: May cause: irritation of nose and throat

Target Organs: None reported

Medical Conditions Aggravated: Pre-existing: Eye conditions Skin conditions Respiratory conditions

Chronic Effects: None reported

Cancer / Reproductive Toxicity Information:

O.S.H.A. Listed: No

IARC Listed: No

NTP Listed: No

Additional Cancer / Reproductive Toxicity Information: Not applicable

Toxicologically Synergistic Products: None reported

4. FIRST AID

Eye Contact: Immediately flush eyes with water for 15 minutes. Call physician.

Skin Contact (First Aid): Wash skin with plenty of water for 15 minutes. Call physician immediately.

Ingestion (First Aid): Do not induce vomiting. Give 1-2 glasses of water. Call physician immediately. Never give anything by mouth to an unconscious person.

Inhalation: Remove to fresh air.

5. FIRE FIGHTING MEASURES

Flammable Properties: During a fire, irritating and highly toxic gases may be generated by thermal decomposition.

Flash Point: Not applicable

Method: Not applicable

Flammability Limits:

Lower Explosion Limits: Not applicable
Upper Explosion Limits: Not applicable
Autoignition Temperature: Not applicable
Hazardous Combustion Products: Toxic fumes of: ammonia nitrogen oxides. sulfur oxides.
Fire / Explosion Hazards: May react violently with: chlorine / chlorine compounds metal nitrates metal nitrites nitric acid
Static Discharge: None reported.
Mechanical Impact: None reported
Extinguishing Media: Dry chemical. Water.
Fire Fighting Instruction: As in any fire, wear self-contained breathing apparatus pressure-demand and full protective gear.

6. ACCIDENTAL RELEASE MEASURES

Spill Response Notice:

Only persons properly qualified to respond to an emergency involving hazardous substances may respond to a spill according to federal regulations (OSHA 29 CFR 1910.120(a)(v)) and per your company's emergency response plan and guidelines/procedures. See Section 13, Special Instructions for disposal assistance.

Containment Technique: Stop spilled material from being released to the environment. Cover spilled solid material with sand or other inert material.

Clean-up Technique: Scoop up spilled material into a large beaker and dissolve with water. Adjust to a pH between 6 and 9 with an alkali, such as soda ash or sodium bicarbonate. Flush reacted material to the drain with a large excess of water. Decontaminate the area of the spill with a soap solution.

Evacuation Procedure: Evacuate local area (15 foot radius or as directed by your facility's emergency response plan) when: a pound or more of loose powder is spilled. If conditions warrant, increase the size of the evacuation.

Special Instructions (for accidental release): Product is regulated as RCRA hazardous waste.

304 EHS RQ (40 CFR 355): Not applicable

D.O.T. Emergency Response Guide Number: 154

7. HANDLING / STORAGE

Handling: Avoid contact with eyes skin Do not breathe dust. Maintain general industrial hygiene practices when using this product.

Storage: Store away from: oxidizers alkalis chlorine/chlorinated metals Protect from: heat moisture

Flammability Class: Not applicable

8. EXPOSURE CONTROLS / PROTECTIVE EQUIPMENT

Engineering Controls: Have an eyewash station nearby. Maintain general industrial hygiene practices when using this product.

Personal Protective Equipment:

Eye Protection: safety glasses with top and side shields

Skin Protection: disposable latex gloves lab coat

Inhalation Protection: adequate ventilation

Precautionary Measures: Avoid contact with: eyes skin Do not breathe: dust Wash thoroughly after handling. Keep away from: alkalies metals Protect from: heat moisture

TLV: Not established

PEL: Not established

9. PHYSICAL / CHEMICAL PROPERTIES

Appearance: White crystals

Physical State: Solid

Molecular Weight: 97.10
Odor: None
pH: 1% soln = 1.18
Vapor Pressure: Not applicable
Vapor Density (air = 1): Not applicable
Boiling Point: Not applicable
Melting Point: Product decomposes at 205 °C; 401 °F
Specific Gravity (water = 1): 2.15
Evaporation Rate (water = 1): Not applicable
Volatile Organic Compounds Content: Not applicable
Partition Coefficient (n-octanol / water): None reported
Solubility:
 Water: 1:2 ratio @ 80 ° C (176 °F)
 Acid: Soluble
 Other: Slightly soluble in alcohol, methanol.
Metal Corrosivity:
 Steel: 0.814 in/yr
 Aluminum: 0.212 in/yr

10. STABILITY / REACTIVITY

Chemical Stability: Stable when stored under proper conditions.
Conditions to Avoid: Heating to decomposition. Excess moisture
Reactivity / Incompatibility: May react violently in contact with: chlorates metal nitrates metal nitrites nitric acid Incompatible with: alkalies oxidizers
Hazardous Decomposition: Heating to decomposition releases toxic and/or corrosive fumes of: ammonia nitrogen oxides sulfur oxides
Hazardous Polymerization: Will not occur.

11. TOXICOLOGICAL INFORMATION

Product Toxicological Data:
 LD50: Oral rat LD50 = 3160 mg/kg.
 LC50: None reported
Dermal Toxicity Data: None reported
Skin and Eye Irritation Data: Skin Human 4%/5 days intermittent MILD, Skin rabbit 500 mg/24H SEVERE, Eye rabbit 20mg MODERATE, Eye rabbit 250µg/24H SEVERE.
Mutation Data: None reported
Reproductive Effects Data: None reported
Ingredient Toxicological Data: --
 Not applicable

12. ECOLOGICAL INFORMATION

Product Ecological Information: --
 No ecological data available for this product.
Ingredient Ecological Information: --
 Not applicable

13. DISPOSAL CONSIDERATIONS

EPA Waste ID Number: None

Special Instructions (Disposal): Dilute to 3 to 5 times the volume with cold water. Adjust to a pH between 6 and 9 with an alkali, such as soda ash or sodium bicarbonate. Open cold water tap completely, slowly pour the reacted material to the drain.

Empty Containers: Rinse three times with an appropriate solvent. Dispose of empty container as normal trash.

NOTICE (Disposal): These disposal guidelines are based on federal regulations and may be superseded by more stringent state or local requirements. Please consult your local environmental regulators for more information.

14. TRANSPORT INFORMATION

D.O.T.:

D.O.T. Proper Shipping Name: Sulphamic Acid

--

DOT Hazard Class: 8

DOT Subsidiary Risk: NA

DOT ID Number: UN2967

DOT Packing Group: III

I.C.A.O.:

I.C.A.O. Proper Shipping Name: Sulphamic Acid

--

ICAO Hazard Class: 8

ICAO Subsidiary Risk: NA

ICAO ID Number: UN2967

ICAO Packing Group: III

I.M.O.:

I.M.O. Proper Shipping Name: Sulphamic Acid

--

I.M.O. Hazard Class: 8

I.M.O. Subsidiary Risk: NA

I.M.O. ID Number: UN2967

I.M.O. Packing Group: III

Additional Information: This product may be shipped as part of a chemical kit composed of various compatible dangerous goods for analytical or testing purposes. This kit would have the following classification:

Hazard Class: 9 UN Number 3316.

Proper Shipping Name: Chemical Kit

15. REGULATORY INFORMATION

U.S. Federal Regulations:

O.S.H.A.: This product meets the criteria for a hazardous substance as defined in the Hazard Communication Standard. (29 CFR 1910.1200)

E.P.A.:

S.A.R.A. Title III Section 311/312 Categorization (40 CFR 370): Immediate (Acute) Health Hazard

S.A.R.A. Title III Section 313 (40 CFR 372): This product does NOT contain any chemical subject to the reporting requirements of Section 313 of Title III of SARA.

--

302 (EHS) TPQ (40 CFR 355): Not applicable

304 CERCLA RQ (40 CFR 302.4): Not applicable

304 EHS RQ (40 CFR 355): Not applicable

Clean Water Act (40 CFR 116.4): Not applicable

RCRA: Contains no RCRA regulated substances.

C.P.S.C.: Not applicable

State Regulations:

California Prop. 65: No Prop. 65 listed chemicals are present in this product.

Identification of Prop. 65 Ingredient(s): Not applicable
Trade Secret Registry: Not applicable
National Inventories:
U.S. Inventory Status: TSCA Listed: Yes
TSCA CAS Number: 5329-14-6

16. OTHER INFORMATION

Intended Use: Laboratory Reagent

References: Vendor Information. NIOSH Registry of Toxic Effects of Chemical Substances, 1985-86. Cincinnati: U.S. Department of Health and Human Services, April, 1987. Gosselin, R. E. et al. Clinical Toxicology of Commercial Products, 5th Ed. Baltimore: The Williams and Wilkins Co., 1984. Fire Protection Guide on Hazardous Materials, 10th Ed. Quincy, MA: National Fire Protection Association, 1991. Outside Testing. Technical Judgment. The Merck Index, 11th Ed. Rahway, New Jersey: Merck and Co., Inc., 1989. Sax, N. Irving. Dangerous Properties of Industrial Materials, 7th Ed. New York: Van Nostrand Reinhold Co., 1989. Air Contaminants, Federal Register, Vol. 54, No. 12. Thursday, January 19, 1989. pp. 2332-2983. TLV's Threshold Limit Values and Biological Exposure Indices for 1992-1993. American Conference of Governmental Industrial Hygienists, 1992.

Revision Summary: Updates in Section(s) 14,

Legend:

NA - Not Applicable	w/w - weight/weight
ND - Not Determined	w/v - weight/volume
NV - Not Available	v/v - volume/volume

USER RESPONSIBILITY: Each user should read and understand this information and incorporate it in individual site safety programs in accordance with applicable hazard communication standards and regulations.

THE INFORMATION CONTAINED HEREIN IS BASED ON DATA CONSIDERED TO BE ACCURATE. HOWEVER, NO WARRANTY IS EXPRESSED OR IMPLIED REGARDING THE ACCURACY OF THESE DATA OR THE RESULTS TO BE OBTAINED FROM THE USE THEREOF.

HACH COMPANY ©2007

World Headquarters
Hach Company
P.O.Box 389
Loveland, CO USA 80539
(970) 669-3050

MSDS No: M00818

MATERIAL SAFETY DATA SHEET

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Name: Hydrogen Sulfide Test Paper
Catalog Number: 2537733

Hach Company
P.O.Box 389
Loveland, CO USA 80539
(970) 669-3050

Emergency Telephone Numbers:
(Medical and Transportation)
(303) 623-5716 24 Hour Service
(515)232-2533 8am - 4pm CST

MSDS Number: M00818
Chemical Name: Not applicable
CAS No.: Not applicable
Chemical Formula: Not applicable
Chemical Family: Not applicable
Hazard: Harmful if swallowed May cause irritation.
Date of MSDS Preparation:
Day: 06
Month: October
Year: 2006

2. COMPOSITION / INFORMATION ON INGREDIENTS

Paper saturated with Copper Sulfate

CAS No.: 7758-99-8
TSCA CAS Number: 7758-98-7
Percent Range: 100.0
Percent Range Units: weight / weight
LD50: Oral rat LD50 = 300 mg/kg
LC50: None reported
TLV: 1 mg/m³ (Cu)
PEL: 1 mg/m³ (Cu)
Hazard: Harmful if swallowed Harmful if inhaled. May cause irritation.

3. HAZARDS IDENTIFICATION

Emergency Overview:
Appearance: Pale blue paper discs
Odor: Odorless
HARMFUL IF SWALLOWED MAY CAUSE EYE, SKIN AND RESPIRATORY TRACT IRRITATION

HMIS:
Health: 3

Flammability: 0
Reactivity: 0
Protective Equipment: X - See protective equipment, Section 8.

NFPA:

Health: 2
Flammability: 0
Reactivity: 0
Symbol: Not applicable

Potential Health Effects:

Eye Contact: May cause irritation

Skin Contact: May cause irritation

Skin Absorption: None reported

Target Organs: None reported

Ingestion: Toxic May cause: abdominal pain nausea vomiting metallic taste diarrhea headache central nervous system effects convulsions coma liver damage kidney damage death

Target Organs: Liver Kidneys Central nervous system

Inhalation: Not applicable

Target Organs: Not applicable

Medical Conditions Aggravated: Wilson's disease Pre-existing: Skin conditions Respiratory conditions Liver conditions Kidney conditions

Chronic Effects: Chronic overexposure may cause dermatitis greenish discoloration of the skin or hair metallic taste

Cancer / Reproductive Toxicity Information:

O.S.H.A. Listed: No

IARC Listed: No

NTP Listed: No

Additional Cancer / Reproductive Toxicity Information: None reported

Toxicologically Synergistic Products: Not applicable

4. FIRST AID

Eye Contact: Immediately flush eyes with water for 15 minutes. Call physician.

Skin Contact (First Aid): Wash skin with plenty of water. Call physician if irritation develops.

Ingestion (First Aid): Induce vomiting using syrup of ipecac or by sticking finger down throat. Never give anything by mouth to an unconscious person. Call physician immediately.

Inhalation: Remove to fresh air.

5. FIRE FIGHTING MEASURES

Flammable Properties: Can burn in fire, releasing toxic vapors.

Flash Point: Not applicable

Method: Not applicable

Flammability Limits:

Lower Explosion Limits: Not applicable

Upper Explosion Limits: Not applicable

Autoignition Temperature: Not determined

Hazardous Combustion Products: Toxic fumes of: sulfur oxides.

Fire / Explosion Hazards: Do not expose to flames.

Static Discharge: None reported.

Mechanical Impact: None reported

Extinguishing Media: Use media appropriate to surrounding fire conditions

Fire Fighting Instruction: As in any fire, wear self-contained breathing apparatus pressure-demand and full protective gear.

6. ACCIDENTAL RELEASE MEASURES

Spill Response Notice:

Only persons properly qualified to respond to an emergency involving hazardous substances may respond to a spill according to federal regulations (OSHA 29 CFR 1910.120(a)(v)) and per your company's emergency response plan and guidelines/procedures. See Section 13, Special Instructions for disposal assistance.

Containment Technique: Stop spilled material from being released to the environment. Releases of this material may contaminate the environment.

Clean-up Technique: Sweep up material. Place material in a plastic bag. Mark bag 'Non-hazardous trash', and dispose of as normal refuse.

Evacuation Procedure: Evacuate as needed to perform spill clean-up. If conditions warrant, increase the size of the evacuation.

Special Instructions (for accidental release): Product is regulated as a hazardous water pollutant.

304 EHS RQ (40 CFR 355): Not applicable

D.O.T. Emergency Response Guide Number: Not applicable

7. HANDLING / STORAGE

Handling: Avoid contact with eyes skin clothing Do not breathe dust. Wash thoroughly after handling. Maintain general industrial hygiene practices when using this product.

Storage: Keep container tightly closed when not in use.

Flammability Class: Not applicable

8. EXPOSURE CONTROLS / PROTECTIVE EQUIPMENT

Engineering Controls: Maintain adequate ventilation to keep vapor level below TWA for chemicals in this product. Maintain general industrial hygiene practices when using this product.

Personal Protective Equipment:

Eye Protection: safety glasses with top and side shields

Skin Protection: lab coat disposable latex gloves

Inhalation Protection: adequate ventilation

Precautionary Measures: Avoid contact with: eyes skin clothing Do not breathe: dust Wash thoroughly after handling.

TLV: 1 mg/M³ (Cu)

PEL: 1 mg/M³ (Cu)

9. PHYSICAL / CHEMICAL PROPERTIES

Appearance: Pale blue paper discs

Physical State: Solid

Molecular Weight: Not applicable

Odor: Odorless

pH: Not applicable

Vapor Pressure: Not applicable

Vapor Density (air = 1): Not applicable

Boiling Point: Not applicable

Melting Point: Not applicable

Specific Gravity (water = 1): Not applicable

Evaporation Rate (water = 1): Not applicable

Volatile Organic Compounds Content: Not applicable

Partition Coefficient (n-octanol / water): Not applicable

Solubility:

Water: Not applicable

Acid: Not applicable

Other: Not applicable

Metal Corrosivity:

Steel: Not determined

Aluminum: Not determined

10. STABILITY / REACTIVITY

Chemical Stability: Stable when stored under proper conditions.

Conditions to Avoid: Heating to decomposition.

Reactivity / Incompatibility: Incompatible with: hydroxylamine magnesium

Hazardous Decomposition: Heating to decomposition releases toxic and/or corrosive fumes of: sulfur oxides

Hazardous Polymerization: Will not occur.

11. TOXICOLOGICAL INFORMATION

Product Toxicological Data:

LD50: None reported

LC50: None reported

Dermal Toxicity Data: None reported

Skin and Eye Irritation Data: None reported

Mutation Data: Copper sulfate: DNA inhibition - human lymphocytes - 76 µmol/l

Reproductive Effects Data: None reported

Ingredient Toxicological Data: Copper sulfate: Oral rat LD50 = 300 mg/kg

12. ECOLOGICAL INFORMATION

Product Ecological Information: --

No ecological data available for this product.

Ingredient Ecological Information: --

No ecological data available for the ingredients of this product.

13. DISPOSAL CONSIDERATIONS

EPA Waste ID Number: None

Special Instructions (Disposal): Place material in a plastic bag. Add a non-reactive absorbant material if waste contains free liquid and seal bag. Mark bag 'Non-hazardous trash', and dispose of as normal refuse.

Empty Containers: Rinse three times with an appropriate solvent. Dispose of empty container as normal trash.

NOTICE (Disposal): These disposal guidelines are based on federal regulations and may be superseded by more stringent state or local requirements. Please consult your local environmental regulators for more information.

14. TRANSPORT INFORMATION

D.O.T.:

D.O.T. Proper Shipping Name: Not Currently Regulated

--

DOT Hazard Class: NA

DOT Subsidiary Risk: NA

DOT ID Number: NA

DOT Packing Group: NA
I.C.A.O.:
I.C.A.O. Proper Shipping Name: Not Currently Regulated
--
ICAO Hazard Class: NA
ICAO Subsidiary Risk: NA
ICAO ID Number: NA
ICAO Packing Group: NA

I.M.O.:
I.M.O. Proper Shipping Name: Not Currently Regulated
--
I.M.O. Hazard Class: NA
I.M.O. Subsidiary Risk: NA
I.M.O. ID Number: NA
I.M.O. Packing Group: NA

Additional Information: This product may be shipped as part of a chemical kit composed of various compatible dangerous goods for analytical or testing purposes. This kit would have the following classification: Proper Shipping Name: Chemical Kit
Hazard Class: 9 UN Number 3316. ALSO NOTE: If the National Competent Authority declares this product an environmental hazard by Special Provision 909 (IMDG) and Special Provision A97 (IATA) the classification may be UN3077 or UN3082.

15. REGULATORY INFORMATION

U.S. Federal Regulations:

O.S.H.A.: This product meets the criteria for a hazardous substance as defined in the Hazard Communication Standard. (29 CFR 1910.1200)

E.P.A.:

S.A.R.A. Title III Section 311/312 Categorization (40 CFR 370): Immediate (Acute) Health Hazard

S.A.R.A. Title III Section 313 (40 CFR 372): This product contains a chemical(s) subject to the reporting requirements of Section 313 of Title III of SARA.

Copper compounds

302 (EHS) TPQ (40 CFR 355): Not applicable

304 CERCLA RQ (40 CFR 302.4): Cupric sulfate 10 lbs.

304 EHS RQ (40 CFR 355): Not applicable

Clean Water Act (40 CFR 116.4): Cupric Sulfate - RQ 10 lbs.

RCRA: Contains no RCRA regulated substances.

C.P.S.C.: Not applicable

State Regulations:

California Prop. 65: No Prop. 65 listed chemicals are present in this product.

Identification of Prop. 65 Ingredient(s): Not applicable

Trade Secret Registry: Not applicable

National Inventories:

U.S. Inventory Status: All ingredients in this product are listed on the TSCA 8(b) Inventory (40 CFR 710).

TSCA CAS Number: Copper sulfate (7758-98-7)

16. OTHER INFORMATION

Intended Use: Determination of hydrogen sulfide

References: 29 CFR 1900 - 1910 (Code of Federal Regulations - Labor). Air Contaminants, Federal Register, Vol. 54, No. 12. Thursday, January 19, 1989. pp. 2332-2983. TLV's Threshold Limit Values and Biological Exposure Indices for 1992-1993. American Conference of Governmental Industrial Hygienists, 1992. The Merck Index, 11th Ed. Rahway, New Jersey: Merck and Co., Inc., 1989. Sax, N. Irving. Dangerous Properties of Industrial Materials, 7th Ed. New York: Van Nostrand Reinhold Co., 1989. CCINFO RTECS.

Canadian Centre for Occupational Health and Safety. Hamilton, Ontario Canada: 30 June 1993. Gosselin, R. E. et al. Clinical Toxicology of Commercial Products, 5th Ed. Baltimore: The Williams and Wilkins Co., 1984. Vendor Information. Technical Judgment.

Revision Summary: Updates in Section(s) 14,

Legend:

NA - Not Applicable	w/w - weight/weight
ND - Not Determined	w/v - weight/volume
NV - Not Available	v/v - volume/volume

USER RESPONSIBILITY: Each user should read and understand this information and incorporate it in individual site safety programs in accordance with applicable hazard communication standards and regulations.

THE INFORMATION CONTAINED HEREIN IS BASED ON DATA CONSIDERED TO BE ACCURATE. HOWEVER, NO WARRANTY IS EXPRESSED OR IMPLIED REGARDING THE ACCURACY OF THESE DATA OR THE RESULTS TO BE OBTAINED FROM THE USE THEREOF.

HACH COMPANY ©2007

World Headquarters
Hach Company
P.O.Box 389
Loveland, CO USA 80539
(970) 669-3050

MSDS No: M00558

MATERIAL SAFETY DATA SHEET

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Name: Alka-Seltzer Without Aspirin
Catalog Number: 1453300

Hach Company
P.O.Box 389
Loveland, CO USA 80539
(970) 669-3050

Emergency Telephone Numbers:
(Medical and Transportation)
(303) 623-5716 24 Hour Service
(515)232-2533 8am - 4pm CST

MSDS Number: M00558
Chemical Name: Not applicable
CAS No.: Not applicable
Chemical Formula: Not applicable
Chemical Family: Not applicable
Hazard: No effects anticipated.
Date of MSDS Preparation:
Day: 27
Month: April
Year: 2005

2. COMPOSITION / INFORMATION ON INGREDIENTS

Potassium Bicarbonate

CAS No.: 298-14-6
TSCA CAS Number: 298-14-6
Percent Range: 10.0 - 20.0
Percent Range Units: weight / weight
LD50: None reported
LC50: None reported
TLV: Not established
PEL: Not established
Hazard: May cause irritation.

Citric Acid

CAS No.: 77-92-9
TSCA CAS Number: 77-92-9
Percent Range: 35.0 - 45.0
Percent Range Units: weight / weight
LD50: Oral rat LD50 = 6730 mg/Kg
LC50: None reported
TLV: Not established
PEL: Not established
Hazard: Causes severe eye irritation.

Sodium Bicarbonate

CAS No.: 144-55-8
TSCA CAS Number: 144-55-8

Percent Range: 40.0 - 50.0
Percent Range Units: weight / weight
LD50: Oral rat LD50 = 4220 mg/kg
LC50: None reported
TLV: Not established
PEL: Not established
Hazard: May cause irritation.

3. HAZARDS IDENTIFICATION

Emergency Overview:

Appearance: White tablets

Odor: None

HMIS:

Health: 1

Flammability: 1

Reactivity: 0

Protective Equipment: X - See protective equipment, Section 8.

NFPA:

Health: 1

Flammability: 1

Reactivity: 0

Symbol: Not applicable

Potential Health Effects:

Eye Contact: No effects are anticipated

Skin Contact: No effects are anticipated

Skin Absorption: No effects anticipated

Target Organs: Not applicable

Ingestion: Very large doses may cause: gastrointestinal disturbances alkalosis which causes abnormally high alkali reserve of the blood and other body fluids

Target Organs: Blood

Inhalation: No effects anticipated

Target Organs: Not applicable

Medical Conditions Aggravated: None reported

Chronic Effects: None reported

Cancer / Reproductive Toxicity Information:

This product does NOT contain any OSHA listed carcinogens.

This product does NOT contain any IARC listed chemicals.

This product does NOT contain any NTP listed chemicals.

Additional Cancer / Reproductive Toxicity Information: None reported

Toxicologically Synergistic Products: None reported

4. FIRST AID

Eye Contact: Flush eyes with water. Call physician if irritation develops.

Skin Contact (First Aid): Wash skin with plenty of water.

Ingestion (First Aid): Give large quantities of water. Call physician immediately.

Inhalation: None required.

5. FIRE FIGHTING MEASURES

Flammable Properties: During a fire, this product decomposes to form toxic gases.

Flash Point: Not applicable

Method: Not applicable

Flammability Limits:

Lower Explosion Limits: Not applicable

Upper Explosion Limits: Not applicable

Autoignition Temperature: Not applicable

Hazardous Combustion Products: None reported

Fire / Explosion Hazards: None reported

Static Discharge: None reported.

Mechanical Impact: None reported

Extinguishing Media: Use media appropriate to surrounding fire conditions

Fire Fighting Instruction: As in any fire, wear self-contained breathing apparatus pressure-demand and full protective gear. Evacuate area and fight fire from a safe distance.

6. ACCIDENTAL RELEASE MEASURES

Spill Response Notice:

Only persons properly qualified to respond to an emergency involving hazardous substances may respond to a spill according to federal regulations (OSHA 29 CFR 1910.120(a)(v)) and per your company's emergency response plan and guidelines/procedures. See Section 13, Special Instructions for disposal assistance.

Containment Technique: Stop spilled material from being released to the environment.

Clean-up Technique: Scoop up spilled material into a large beaker and dissolve with water. Flush reacted material to the drain with a large excess of water. Decontaminate the area of the spill with a soap solution.

Evacuation Procedure: Evacuate as needed to perform spill clean-up. If conditions warrant, increase the size of the evacuation.

Special Instructions (for accidental release): Not applicable

304 EHS RQ (40 CFR 355): Not applicable

D.O.T. Emergency Response Guide Number: Not applicable

7. HANDLING / STORAGE

Handling: Maintain general industrial hygiene practices when using this product.

Storage: Store in a cool, dry place.

Flammability Class: Not applicable

8. EXPOSURE CONTROLS / PROTECTIVE EQUIPMENT

Engineering Controls: Maintain general industrial hygiene practices when using this product.

Personal Protective Equipment:

Eye Protection: Not applicable

Skin Protection: Not applicable

Inhalation Protection: Not applicable

Precautionary Measures: Not applicable

TLV: Not established

PEL: Not established

9. PHYSICAL / CHEMICAL PROPERTIES

Appearance: White tablets

Physical State: Solid
Molecular Weight: Not applicable
Odor: None
pH: Not applicable
Vapor Pressure: Not applicable
Vapor Density (air = 1): Not applicable
Boiling Point: Not applicable
Melting Point: Not determined
Specific Gravity (water = 1): Not determined
Evaporation Rate (water = 1): Not applicable
Volatile Organic Compounds Content: None
Partition Coefficient (n-octanol / water): Not applicable
Solubility:
 Water: Soluble
 Acid: Not determined
 Other: Not determined
Metal Corrosivity:
 Steel: Not determined
 Aluminum: Not determined

10. STABILITY / REACTIVITY

Chemical Stability: Stable when stored under proper conditions.
Conditions to Avoid: Excess moisture Extreme temperatures
Reactivity / Incompatibility: None reported
Hazardous Decomposition: No hazardous decomposition products known.
Hazardous Polymerization: Will not occur.

11. TOXICOLOGICAL INFORMATION

Product Toxicological Data:
 LD50: None reported
 LC50: None reported
 Dermal Toxicity Data: None reported
 Skin and Eye Irritation Data: None reported
 Mutation Data: None reported
 Reproductive Effects Data: None reported
Ingredient Toxicological Data: Sodium Bicarbonate: Oral rat LD₅₀ = 4220 mg/kg. Citric Acid: Oral rat LD₅₀ = 6730 mg/kg.

12. ECOLOGICAL INFORMATION

Product Ecological Information: --
No ecological data available for this product.
Ingredient Ecological Information: --
No ecological data available for the ingredients of this product.

13. DISPOSAL CONSIDERATIONS

EPA Waste ID Number: Not applicable
Special Instructions (Disposal): Working in a large container, cautiously add small portions of the material to cold water with agitation. Open cold water tap completely, slowly pour the reacted material to the drain. Flush system with plenty of water.

Empty Containers: Rinse three times with an appropriate solvent. Dispose of empty container as normal trash.

NOTICE (Disposal): These disposal guidelines are based on federal regulations and may be superseded by more stringent state or local requirements. Please consult your local environmental regulators for more information.

14. TRANSPORT INFORMATION

D.O.T.:

D.O.T. Proper Shipping Name: Not Currently Regulated

--

DOT Hazard Class: NA

DOT Subsidiary Risk: NA

DOT ID Number: NA

DOT Packing Group: NA

I.C.A.O.:

I.C.A.O. Proper Shipping Name: Not Currently Regulated

--

ICAO Hazard Class: NA

ICAO Subsidiary Risk: NA

ICAO ID Number: NA

ICAO Packing Group: NA

I.M.O.:

I.M.O. Proper Shipping Name: Not Currently Regulated

--

I.M.O. Hazard Class: NA

I.M.O. Subsidiary Risk: NA

I.M.O. ID Number: NA

I.M.O. Packing Group: NA

Additional Information: This product may be shipped as part of a chemical kit composed of various compatible dangerous goods for analytical or testing purposes. This kit would have the following classification:

Hazard Class: 9 UN Number 3316.

Proper Shipping Name: Chemical Kit

15. REGULATORY INFORMATION

U.S. Federal Regulations:

O.S.H.A.: This product does not meet the criteria for a hazardous substance as defined in the Hazard Communication Standard. (29 CFR 1910.1200)

E.P.A.:

S.A.R.A. Title III Section 311/312 Categorization (40 CFR 370): This product is not hazardous under 29 CFR.1910.1200 and therefore is not covered by Title III under SARA.

S.A.R.A. Title III Section 313 (40 CFR 372): This product does NOT contain any chemical subject to the reporting requirements of Section 313 of Title III of SARA.

--

302 (EHS) TPQ (40 CFR 355): Not applicable

304 CERCLA RQ (40 CFR 302.4): Not applicable

304 EHS RQ (40 CFR 355): Not applicable

Clean Water Act (40 CFR 116.4): Not applicable

RCRA: Not applicable

C.P.S.C.: Not applicable

State Regulations:

California Prop. 65: No Prop. 65 listed chemicals are present in this product.

Identification of Prop. 65 Ingredient(s): None

Trade Secret Registry: Not applicable

National Inventories:

U.S. Inventory Status: All ingredients in this product are listed on the TSCA 8(b) Inventory (40 CFR 710).

TSCA CAS Number: Not applicable

16. OTHER INFORMATION

Intended Use: Laboratory Reagent

References: 29 CFR 1900 - 1910 (Code of Federal Regulations - Labor). CCINFO RTECS. Canadian Centre for Occupational Health and Safety. Hamilton, Ontario Canada: 30 June 1993. Fire Protection Guide on Hazardous Materials, 10th Ed. Quincy, MA: National Fire Protection Fire Protection Guide on Hazardous Materials, 10th Ed. Quincy, MA: National Fire Protection Association, 1991. List of Dangerous Substances Classified in Annex I of the EEC Directive (67/548) - Classification, Packaging and Labeling of Dangerous Substances, Amended July 1992. Technical Judgment. Vendor Information.

Revision Summary: Updates in Section(s) 14,

Legend:

NA - Not Applicable	w/w - weight/weight
ND - Not Determined	w/v - weight/volume
NV - Not Available	v/v - volume/volume

USER RESPONSIBILITY: Each user should read and understand this information and incorporate it in individual site safety programs in accordance with applicable hazard communication standards and regulations.

THE INFORMATION CONTAINED HEREIN IS BASED ON DATA CONSIDERED TO BE ACCURATE. HOWEVER, NO WARRANTY IS EXPRESSED OR IMPLIED REGARDING THE ACCURACY OF THESE DATA OR THE RESULTS TO BE OBTAINED FROM THE USE THEREOF.

HACH COMPANY ©2007

World Headquarters
Hach Company
P.O.Box 389
Loveland, CO USA 80539
(970) 669-3050

MSDS No: M00024

MATERIAL SAFETY DATA SHEET

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Name: Ferrous Iron Reagent
Catalog Number: 103769

Hach Company
P.O.Box 389
Loveland, CO USA 80539
(970) 669-3050

Emergency Telephone Numbers:
(Medical and Transportation)
(303) 623-5716 24 Hour Service
(515)232-2533 8am - 4pm CST

MSDS Number: M00024
Chemical Name: Not applicable
CAS No.: Not applicable
Chemical Formula: Not applicable
Chemical Family: Not applicable
Hazard: May cause irritation.
Date of MSDS Preparation:
Day: 05
Month: October
Year: 2006

2. COMPOSITION / INFORMATION ON INGREDIENTS

1, 10-Phenanthroline

CAS No.: 5144-89-8
TSCA CAS Number: 66-71-7
Percent Range: 1.0 - 10.0
Percent Range Units: weight / weight
LD50: Oral Rat LD₅₀ = 132 mg/kg
LC50: None reported
TLV: Not established
PEL: Not established
Hazard: May cause irritation.

Sodium Bicarbonate

CAS No.: 144-55-8
TSCA CAS Number: 144-55-8
Percent Range: 90.0 - 100.0
Percent Range Units: weight / weight
LD50: Oral rat LD₅₀ = 4220 mg/kg
LC50: None reported
TLV: Not established
PEL: Not established
Hazard: May cause irritation.

3. HAZARDS IDENTIFICATION

Emergency Overview:

Appearance: White powder

Odor: Not determined

MAY CAUSE EYE, SKIN AND RESPIRATORY TRACT IRRITATION

HMIS:

Health: 1

Flammability: 0

Reactivity: 0

Protective Equipment: X - See protective equipment, Section 8.

NFPA:

Health: 1

Flammability: 0

Reactivity: 0

Symbol: Not applicable

Potential Health Effects:

Eye Contact: May cause irritation

Skin Contact: May cause irritation

Skin Absorption: None reported

Target Organs: None reported

Ingestion: Very large doses may cause: abdominal pain gastrointestinal disturbances alkalosis which causes abnormally high alkali reserve of the blood and other body fluids hypotension

Target Organs: None reported

Inhalation: May cause: respiratory tract irritation

Target Organs: None reported

Medical Conditions Aggravated: Pre-existing: Kidney conditions

Chronic Effects: None reported

Cancer / Reproductive Toxicity Information:

This product does NOT contain any OSHA listed carcinogens.

This product does NOT contain any IARC listed chemicals.

This product does NOT contain any NTP listed chemicals.

Additional Cancer / Reproductive Toxicity Information: None reported

Toxicologically Synergistic Products: None reported

4. FIRST AID

Eye Contact: Immediately flush eyes with water for 15 minutes. Call physician.

Skin Contact (First Aid): Wash skin with soap and plenty of water. Call physician if irritation develops.

Ingestion (First Aid): Give large quantities of water. Call physician immediately.

Inhalation: Remove to fresh air.

5. FIRE FIGHTING MEASURES

Flammable Properties: Does not burn, but may melt in a fire, releasing toxic fumes.

Flash Point: Not applicable

Method: Not applicable

Flammability Limits:

Lower Explosion Limits: Not applicable

Upper Explosion Limits: Not applicable

Autoignition Temperature: Not applicable

Hazardous Combustion Products: Toxic fumes of: sodium monoxide nitrogen oxides. carbon monoxide, carbon dioxide.

Fire / Explosion Hazards: None reported

Static Discharge: None reported.

Mechanical Impact: None reported

Extinguishing Media: Water. Carbon dioxide Dry chemical.

Fire Fighting Instruction: As in any fire, wear self-contained breathing apparatus pressure-demand and full protective gear.

6. ACCIDENTAL RELEASE MEASURES

Spill Response Notice:

Only persons properly qualified to respond to an emergency involving hazardous substances may respond to a spill according to federal regulations (OSHA 29 CFR 1910.120(a)(v)) and per your company's emergency response plan and guidelines/procedures. See Section 13, Special Instructions for disposal assistance.

Containment Technique: Stop spilled material from being released to the environment.

Clean-up Technique: Scoop up spilled material into a large beaker and dissolve with water. Flush the spilled material to the drain with a large excess of water. Decontaminate the area of the spill with a weak acid solution.

Evacuation Procedure: Evacuate as needed to perform spill clean-up. If conditions warrant, increase the size of the evacuation.

Special Instructions (for accidental release): Not applicable

304 EHS RQ (40 CFR 355): Not applicable

D.O.T. Emergency Response Guide Number: None

7. HANDLING / STORAGE

Handling: Avoid contact with eyes skin Do not breathe dust. Wash thoroughly after handling. Maintain general industrial hygiene practices when using this product.

Storage: Keep container tightly closed when not in use. Protect from: moisture oxidizers

Flammability Class: Not applicable

8. EXPOSURE CONTROLS / PROTECTIVE EQUIPMENT

Engineering Controls: Have an eyewash station nearby. Maintain general industrial hygiene practices when using this product.

Personal Protective Equipment:

Eye Protection: safety glasses with top and side shields

Skin Protection: disposable latex gloves

Inhalation Protection: adequate ventilation

Precautionary Measures: Avoid contact with: eyes skin Do not breathe: dust Wash thoroughly after handling. Keep away from: oxidizers

TLV: Not established

PEL: Not established

9. PHYSICAL / CHEMICAL PROPERTIES

Appearance: White powder

Physical State: Solid

Molecular Weight: Not applicable

Odor: Not determined

pH: Not determined

Vapor Pressure: Not applicable

Vapor Density (air = 1): Not applicable
Boiling Point: Not applicable
Melting Point: Not determined
Specific Gravity (water = 1): 2.10
Evaporation Rate (water = 1): Not applicable
Volatile Organic Compounds Content: Not applicable
Partition Coefficient (n-octanol / water): Not applicable
Solubility:
 Water: Slightly soluble
 Acid: Slightly soluble
 Other: Not determined
Metal Corrosivity:
 Steel: Not determined
 Aluminum: Not determined

10. STABILITY / REACTIVITY

Chemical Stability: Stable when stored under proper conditions.
Conditions to Avoid: Excess moisture Heating to decomposition.
Reactivity / Incompatibility: Incompatible with: oxidizers
Hazardous Decomposition: Toxic fumes of: nitrogen oxides sodium oxides carbon monoxide carbon dioxide
Hazardous Polymerization: Will not occur.

11. TOXICOLOGICAL INFORMATION

Product Toxicological Data:
 LD50: None reported
 LC50: None reported
Dermal Toxicity Data: None reported
Skin and Eye Irritation Data: Sodium Bicarbonate: Eye - rabbit - 100 mg/30 seconds - MILD; Skin - Human - 30 mg/3 days intermittent - MILD
Mutation Data: None reported
Reproductive Effects Data: None reported
Ingredient Toxicological Data: Sodium Bicarbonate: Oral rat LD₅₀ = 4220 mg/kg; 1, 10-Phenanthroline: Oral rat LD₅₀ = 132 mg/kg

12. ECOLOGICAL INFORMATION

Product Ecological Information: --
No ecological data available for this product.
Ingredient Ecological Information: --
No ecological data available for the ingredients of this product.

13. DISPOSAL CONSIDERATIONS

EPA Waste ID Number: None
Special Instructions (Disposal): Dilute material with excess water making a weaker than 5% solution. Open cold water tap completely, slowly pour the material to the drain.
Empty Containers: Rinse three times with an appropriate solvent. Dispose of empty container as normal trash.

NOTICE (Disposal): These disposal guidelines are based on federal regulations and may be superseded by more stringent state or local requirements. Please consult your local environmental regulators for more information.

14. TRANSPORT INFORMATION

D.O.T.:

D.O.T. Proper Shipping Name: Not Currently Regulated

--

DOT Hazard Class: NA

DOT Subsidiary Risk: NA

DOT ID Number: NA

DOT Packing Group: NA

I.C.A.O.:

I.C.A.O. Proper Shipping Name: Not Currently Regulated

--

ICAO Hazard Class: NA

ICAO Subsidiary Risk: NA

ICAO ID Number: NA

ICAO Packing Group: NA

I.M.O.:

I.M.O. Proper Shipping Name: Not Currently Regulated

--

I.M.O. Hazard Class: NA

I.M.O. Subsidiary Risk: NA

I.M.O. ID Number: NA

I.M.O. Packing Group: NA

Additional Information: This product may be shipped as part of a chemical kit composed of various compatible dangerous goods for analytical or testing purposes. This kit would have the following classification:

Hazard Class: 9 UN Number 3316.

Proper Shipping Name: Chemical Kit

ALSO NOTE: If the National Competent Authority declares this product an environmental hazard by Special Provision 909 (IMDG) and Special Provision A97 (IATA) the classification may be UN3077 or UN3082.

15. REGULATORY INFORMATION

U.S. Federal Regulations:

O.S.H.A.: This product meets the criteria for a hazardous substance as defined in the Hazard Communication Standard. (29 CFR 1910.1200)

E.P.A.:

S.A.R.A. Title III Section 311/312 Categorization (40 CFR 370): Immediate (Acute) Health Hazard

S.A.R.A. Title III Section 313 (40 CFR 372): This product does NOT contain any chemical subject to the reporting requirements of Section 313 of Title III of SARA.

--

302 (EHS) TPQ (40 CFR 355): Not applicable

304 CERCLA RQ (40 CFR 302.4): Not applicable

304 EHS RQ (40 CFR 355): Not applicable

Clean Water Act (40 CFR 116.4): Not applicable

RCRA: Contains no RCRA regulated substances.

C.P.S.C.: Not applicable

State Regulations:

California Prop. 65: No Prop. 65 listed chemicals are present in this product.

Identification of Prop. 65 Ingredient(s): None

Trade Secret Registry: Not applicable

National Inventories:

U.S. Inventory Status: All ingredients in this product are listed on the TSCA 8(b) Inventory (40 CFR 710).
TSCA CAS Number: Not applicable

16. OTHER INFORMATION

Intended Use: Iron determination

References: TLV's Threshold Limit Values and Biological Exposure Indices for 1992-1993. American Conference of Governmental Industrial Hygienists, 1992. Air Contaminants, Federal Register, Vol. 54, No. 12. Thursday, January 19, 1989. pp. 2332-2983. 29 CFR 1900 - 1910 (Code of Federal Regulations - Labor). In-house information. Technical Judgment. Fire Protection Guide on Hazardous Materials, 10th Ed. Quincy, MA: National Fire Protection Fire Protection Guide on Hazardous Materials, 10th Ed. Quincy, MA: National Fire Protection Association, 1991.

Revision Summary: Updates in Section(s) 14,

Legend:

NA - Not Applicable	w/w - weight/weight
ND - Not Determined	w/v - weight/volume
NV - Not Available	v/v - volume/volume

USER RESPONSIBILITY: Each user should read and understand this information and incorporate it in individual site safety programs in accordance with applicable hazard communication standards and regulations.

THE INFORMATION CONTAINED HEREIN IS BASED ON DATA CONSIDERED TO BE ACCURATE. HOWEVER, NO WARRANTY IS EXPRESSED OR IMPLIED REGARDING THE ACCURACY OF THESE DATA OR THE RESULTS TO BE OBTAINED FROM THE USE THEREOF.

HACH COMPANY ©2007

Attachment 7
Self Assessment Checklist

JOBSITE SAFETY INSPECTION CHECKLIST

Revision.: 00

STANDARD OF PRACTICE HS-18 - HEALTH AND SAFETY CHECKLIST

Date: 2/20/08

Note: The following jobsite safety inspection checklist is to be used only at locations where Solutions-IES controls the work. It is not to be used at locations where others control the work.

Project Name: <u>Cecil Field Day Tank 1 and Building 46</u>	Solutions-IES Project No.: <u>4080.08A2.CECI</u>
Location: <u>Cecil Field, Jacksonville, Florida</u>	Project Manager: <u>Carrie A. Ruhlman</u>
Inspector: _____	Date: _____

This checklist has been divided into two sections. The first section (I through XXVI) are applicable to all projects. The second section (XXVII through XXIX) addresses specific situations such as hazardous waste, construction activities, and office trailers. There may be some duplication between the first and second sections.

If an item is not applicable, the column titled "N/A" should be checked. If an item is applicable but the auditor does not observe it during the inspection, the "N/O" column should be checked. For each deficiency noted, a Health and Safety Audit Finding Form must be completed. The Corporate Health and Safety Director must be copied on the results of all audits.

Check "Yes" for Items Completed	Yes	No	N/A	N/O
I. JOBSITE OFFICE				
1. Posters and safety signs in place:				
a. OSHA safety poster	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. Emergency Telephone Number Form	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. Workers Compensation Form	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. First aid kit:				
a. Fully stocked/sufficient supply	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. First-aid administered by a person with a valid certificate	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Bloodborne-pathogen kit	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Accident/injury reporting:				
a. Employees briefed	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. Forms available	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. Injuries and illnesses reported and logged	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d. Accidents investigated and properly followed up to prevent reoccurrence	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e. Accident reports and logs submitted promptly as required	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Job safety rules and regulations available/posted	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
II. HAZARD COMMUNICATION				
1. Employee training:				

- a. Employees' signed training certificates on file
- 2. Material safety data sheets (MSDSs):
 - a. MSDSs on file
 - b. Log assigned to competent person
 - c. Log complete and up to date
- 3. Written program on file

III. EMPLOYEE TRAINING

- 1. Safety indoctrination held for new employees
- 2. Sufficient instruction given in recognition and avoidance of job hazards; unsafe conditions; and job rules, regulations, and procedures
- 3. Sufficient instruction in proper use and maintenance of tools, equipment, and personal protective equipment
- 4. Employees instructed to report unsafe or hazardous conditions to proper job supervisor
- 5. Employees instructed to promptly report injury, illness, and accidents involving damage to equipment and materials
- 6. All site personnel have read the job safety rules and regulations and have signed the "Employee Signoff Sheet"

IV. JOBSITE LOGISTICS AND LAYOUT

- 1. Traffic routes around construction areas:
 - a. Warning signs, flagging in place
- 2. Utility ditches:
 - a. Flagged or barricaded
- 3. Trucks and heavy equipment:
 - a. Good mechanical conditions
 - b. Backup signals working
 - c. Seat belts installed and used

V. PUBLIC PROTECTION

- 1. Warning signs in place around site
- 2. After-hours hazards:
 - a. Open ditches protected
- 3. Hazard lights

VI. HOUSEKEEPING

- 1. Material storage yard:
 - a. Stacked neatly and properly
 - b. Aisles, walkways, roads clear
- 2. Check work areas for:
 - a. Loose and waste materials

- b. Vicinity of ladders, stairs, ramps, and machinery
- c. Empty bottles, containers, papers, trash, bands, brick-bats, etc.
- d. Trash cans, dumpsters available and emptied regularly

VII. PERSONAL PROTECTIVE EQUIPMENT (PPE)

- 1. Hard hats
- 2. Safety shoes/boots
- 3. Eye/face protection
- 4. Safety belts/lanyards
- 5. Ear protection:
 - a. Noise level areas of 90 dBA and above identified
 - b. Signs notifying personnel of "Hearing Protection Required" posted as
- 6. Specialized equipment:
 - a. Gloves
 - b. Chemical-Respirators (respirator use requires medical protocol, monitoring and training)
 - c. Chemical-resistant clothing
- 7. Tools:
 - a. Handles in good shape
 - b. Tool guards in place
 - c. Proper tools used for the job
 - d. Tools maintained in functional condition (hammer heads not mushroomed)

VIII. SANITATION

- 1. Temporary toilets:
 - a. Serviced regularly
 - b. Sufficient Quantity (20 or fewer employees - 1 required; 20 or more employees - 1 toilet and 1 urinal per 40 workers)
- 2. Potable Water:
 - a. Tightly closed containers
 - b. Equipped with tap
 - c. Paper cups available
 - d. Containers labeled "Drinking Water"

IX. FLOOR AND WALL OPENINGS GUARDS

XI. SCAFFOLDING**XII. ELECTRICAL**

- | | | | | |
|--|--------------------------|--------------------------|--------------------------|--------------------------|
| 1. Cords/devices have current inspection color code tape installed | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 2. Frayed cords, broken plugs fixed | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 3. Temporary wiring: | | | | |
| a. Panels secured and GFCIs working | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| b. Away from vehicle pathways | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| c. Out of water/moisture | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| d. No broken receptacles found | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| e. Sufficient outlets for all crafts | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 4. Temporary lighting with cages | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 5. Assured equipment grounding conductor program in place, if not using GFCIs | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 6. Lock-out or tag-out system used when necessary | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 7. Electrical dangers posted and guarded | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 8. Fire hazards checked, proper extinguishers available | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 9. Only qualified electricians work on electrical circuits and equipment | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 10. Cords passing through work areas must be covered or elevated to protect them from damage | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 11. Extension cords must be hard or extra-hard usage | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

XIII. TEMPORARY HEATERS**XIV. FIRE PROTECTION**

- | | | | | |
|--|--------------------------|--------------------------|--------------------------|--------------------------|
| 1. Office fire extinguisher in working order and inspected regularly | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 2. One extinguisher, 2A rating, for each 3,000 square feet of protected area | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 3. One extinguisher, 2A rating, on each floor adjacent to each stairway | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 4. Trash, paper, other combustibles picked up | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 5. Welders/roofers have extinguishers nearby and a fire watch is available if needed | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 6. Fire alarm available/fire evacuation plan | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 7. "No Smoking" signs posted and enforced where necessary | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

8. Supervisors and employees trained in proper use of extinguishers

XV. MATERIAL STORAGE AND HANDLING

1. Neat storage area, clear passageways

2. Materials spotted to minimize rehandling and reduce transport distances

3. Power equipment used to handle heavy/awkward loads

4. Stacks on firm footing and all tier stacked materials secured against sudden movement

5. Storage platforms, skids, bins, shelves, etc. in good repair

XVI. DEMOLITION WORK

XVII. STEEL ERECTION

1. Safety nets used, if required

2. Hard hats, eye protection, safety belts, serviceable shoes, gloves, and full clothing used

3. Tag lines used for hoisting tools and material

4. Fire hazards checked at rivet force and welding operations

5. Ladders, stairs, or other safe access provided

6. Hoisting apparatus checked

7. Good housekeeping, welding, and rigging practices observed

XX. FLAMMABLE AND COMBUSTIBLE LIQUIDS

1. All containers clearly marked to show contents (gas cylinders, cans, drums, fuel tanks, etc.)

2. Proper storage practices observed:

a. Storage areas enclosed or protected from heat and mobile equipment exposure

b. Fire hazards checked

c. Sufficient fire extinguishers

d. UL approved safety cans for 1 to 5 gallons of flammable liquids

e. Approved cabinet for indoor storage of liquids in excess of 25-gallons, but not more than 120-gallon storage

f. Sign labeled "Flammable - Keep Fire Away" posted on cabinet

XXI. FLAMMABLE GAS (Oxygen/Acetylene)

1. Cylinders:

a. Away from heat

- | | | | | | |
|----|---|--------------------------|--------------------------|--------------------------|--------------------------|
| b. | Stored upright (secured) | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| c. | Valves closed on empty cylinders | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| d. | Valve protection caps in place if cylinder not in use | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| e. | Valve key wrench available | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| f. | Portable rack with bottles secured | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| g. | Instruct project staff to never drag or slide bottles | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| h. | Designated storage area | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| i. | “No Smoking” signs posted | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| j. | Oxygen bottles stored 20’ from acetylene bottles or 1/2-hour fire barrier installed between them | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 2. | Gauges/valves/hoses: | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| a. | Good condition | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| b. | Fire arresters installed (both hoses) | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 3. | Eye protection available | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 4. | Ventilation adequate | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 5. | When in use, gas lines properly located to prevent tripping and falling hazard | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 6. | All burning torches bled and free of oxygen and acetylene and/or other gases during lunch breaks and other extended periods of time | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

XXII. WELDING OPERATIONS

- | | | | | | |
|----|---|--------------------------|--------------------------|--------------------------|--------------------------|
| 1. | Performed by qualified personnel | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 2. | Screens, shields, or eye protection provided and used to protect employees from welding operation | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 3. | Employees wear sufficient clothing and PPE | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 4. | Equipment checked before use and in operative conditions | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 5. | Electrical equipment grounded | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 6. | Power cables protected and in good repair | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 7. | Power cables properly located to prevent tripping and falling hazards | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

- | | | | | |
|--|--------------------------|--------------------------|--------------------------|--------------------------|
| 8. Dry chemical fire extinguisher within 30 feet | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 9. Exposed combustible materials removed to safe location or properly protected from sparks and slag | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 10. Valid hot work permit required or provided | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 11. Overhead protection provided where required | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 12. "Danger - No Smoking, Matches or Open Lights" signs posted when required | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 13. Adequate lighting and ventilation provided | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 14. Machines turned off at end of shift or when not in use for extended periods | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

XXIII. HOISTS

- | | | | | |
|---|--------------------------|--------------------------|--------------------------|--------------------------|
| 1. Material hoists: | | | | |
| a. Designed by licensed professional engineer | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| b. With tower enclosed for full height on all sides with 1/2-inch by 18--inch Gauge screen mesh, except for landing for landing access | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| c. With tower not enclosed, hoist platform or car will be totally enclosed enclosed on all sides for the full height between floor and overhead covering with 1/2-inch x 14-inch gauge mesh | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| d. Operation rules poster "No Riders Allowed" posted | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| e. Hoisting entrances guarded by substantial gate or bars | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| f. Vertical gates of sufficient height to prevent anyone from looking over over them into shaft | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| g. Competent person assigned to inspect daily | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| h. Weekly inspections logged | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| I. Annual inspection available | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| j. Fire extinguisher in place and inspected | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| k. Load chart posted | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

XXIV. BLASTING

XXV. HAZARDOUS WASTE

Certification and Training of Solutions-IES Personnel

- | | | | | |
|--|--------------------------|--------------------------|--------------------------|--------------------------|
| 1. Medical exam within last 12 months | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 2. 40-hour initial training, 3 days supervised field activities, 8-hour annual Refresher | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 3. First aid and CPR certification | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

- 4. Quantitatively fit tested (preferred method per NIOSH Publication 87-116, 87-116, Appendix B.3)
- 5. Attend pre-entry safety meeting

6. Site Safety Coordinator with appropriate training

Certification and Training of Subcontractor Personnel

- 1. Medical exam within last 12 months
- 2. 40-hour initial training, 3 days supervised field activities, 8-hour Annual refresher
- 3. First aid and CPR certification
- 4. Quantitatively fit tested (preferred method per NIOSH Publication 87-116, (Appendix B.3)
- 5. Attend pre-entry safety meeting

Site Safety Documentation

- 1. Site health and safety plan (HASP) prepared and approved
- 2. HASP onsite
- 3. All personnel onsite identified in HASP
- 4. Documentation of safety briefing
- 5. Hospital map posted
- 6. Phone numbers posted
- 7. Emergency vehicle identified
- 8. Material Safety Data Sheets (MSDSs) onsite
- 9. Work zones delineated (How? _____)
- 10. Wind direction flags in use
- 11. Documentation of calibration of monitoring equipment in Clean environment
- 12. Monitoring conducted and recorded as specified in HSP _____) (Frequency? _____)
- 13. Monitoring for heat/cold stress
- 14. Buddy system in use
- 15. Decontamination procedures established as specified in HSP

- 16. No eating, drinking, or smoking in exclusion and contamination Reduction zones
- 17. Toilet facilities provided
- 18. No contact lenses
- 19. Work conducted during daylight hours only

Safety Briefing

- 1. All personnel attended (including new personnel)
- 2. Documentation of meetings
- 3. Chemical hazards and toxicology reviewed
- 4. Physical hazards reviewed
- 5. Biological hazards reviewed
- 6. Heat/cold stress information reviewed
- 7. Air monitoring requirements
- 8. Levels of protection reviewed
- 9. Work zones reviewed
- 10. Decontamination procedures reviewed
- 11. Emergency response procedures reviewed
- 12. Site communications

Personal Protective Equipment (PPE)

- 1. Levels of protection being worn as specified in HSP
- 2. All appropriate PPE available onsite
- 3. Hard hats being worn
- 4. Appropriate hand protection being used
(What? _____)
- 5. Appropriate body protection being used
(What? _____)
- 6. Appropriate eye protection being used
(What? _____)

- 7. Appropriate ear protection being used
- 8. Appropriate respirator protection being used
- 9. Respirators donned correctly
- 10. TLD badges being used
- 11. If air purifying respirators (APRs) are being used, correct cartridges (Type? _____)

- 12. If self contained breathing apparatuses (SCBAs) are being used, is grade D air being used
- 13. If SCBAs are being used, are cylinders stored correctly
- 14. If PPE is not onsite, prepared to halt work
- 15. Disposal methods in place for disposable PPE

Decontamination Procedures

- 1. Decontamination procedure established as specified in the HSP
- 2. Decontamination zone clearly defined
- 3. PPE properly decontaminated (How? _____)
- 4. Sampling equipment properly decontaminated (How? _____)
- 5. Monitoring equipment properly decontaminated (How? _____)
- 6. Heavy equipment properly decontaminated (How? _____)
- 7. Samples properly decontaminated (How? _____)
- 8. Decontamination fluids appropriately disposed of

- XXVI. CONSTRUCTION INSPECTIONS** _____
- XXVII. OFFICE TRAILERS/BUILDINGS** _____
- XXIII. CONFINED SPACE ENTRY** _____
- XXIX. STAIRWAYS AND LADDERS** _____
- XXX. FALL PROTECTION** _____
- XXXI. EXCAVATIONS** _____
- XXXII. DRILLING** _____

Personnel Safe Work Practices. (3.1)

- 1. Only authorized personnel operating drill rig.

- 2. Personnel cleared during rig startup.
- 3. Personnel clear of rotating parts.
- 4. Personnel not positioned under hoisted loads.
- 5. Loose clothing and jewelry removed.
- 6. Personnel instructed not to approach equipment that has become electrically energized.
- 7. Smoking is prohibited around drilling operation.
- 8. Personnel wearing appropriate PPE, per HSP.
- General (3.2.1)**
- 9. Daily safety briefing/meeting conducted with crew.
- 10. Daily inspection of drill rig and equipment conducted before use.
- Drill Rig Placement (3.2.2)**
- 11. Location of underground utilities identified.
- 12. Safe clearance distance maintained from overhead powerlines.
- 13. Drilling pad established, when necessary.
- 14. Drill rig leveled and stabilized.
- Drill Rig Travel (3.2.3)**
- 15. Rig shut down and mast lowered and secured prior to rig movement.
- 16. Tools and equipment secured prior to rig movement.
- 17. Only personnel seated in cab are riding on rig during movement.
- 18. Safe clearance distance maintained while traveling under overhead powerlines.
- 19. Backup alarm or spotter used when backing rig.
- Drill Rig Operation (3.2.4)**
- 20. Kill switch clearly identified and operational.
- 21. All machine guards are in place.
- 22. Rig ropes not wrapped around body parts.
- 23. Pressurized lines and hoses secured from whipping hazards.
- 24. Drill operation stopped during inclement weather.
- 25. Air monitoring conducted per HSP for hazardous atmospheres.

- | | | | | |
|--|--------------------------|--------------------------|--------------------------|--------------------------|
| 26. Rig placed in neutral when operator not at controls. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| <u>Drill Rig Maintenance (3.2.5)</u> | | | | |
| 27. Defective components repaired immediately. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 28. Lockout/tagout procedures used prior to maintenance. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 29. Cathead in clean, sound condition. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 30. Drill rig ropes and wire lines in clean, sound condition | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 31. Fall protection used for exposures > 6'. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 32. Rig in neutral and augers stopped rotating before cleaning. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 33. Good housekeeping maintained on and around rig. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| <u>Drilling at Hazardous Waste Sites (3.2.6)</u> | | | | |
| 34. Waste disposal according to HSP and Environmental Protection Plan. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 35. Appropriate decontamination procedures followed, per HSP> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

XXXIII. EARTHMOVING EQUIPMENT

XXXIV. DEMOLITION

XXXVI. HAND AND POWER TOOLS

SAFE WORK PRACTICES (3.1)

- | | | | | |
|--|--------------------------|--------------------------|--------------------------|--------------------------|
| 1. All tools operated according to manufacture's instructions. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 2. All hand and power tools maintained in a safe condition and inspected before each use. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 3. Defective tools are tagged and removed from service until repaired. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 4. PPE is selected and used according to tool-specific hazards. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 5. Power tools are not carried or lowered by cord or hose. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 6. Tools are disconnected from energy sources when not in use. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 7. Safety guards remain installed or are promptly replaced after repair. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 8. Tools are stored properly. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 9. Cordless tools and recharging units conform to electrical standards. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 10. Tools used in explosive environments are rated for such use. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 11. Knife or blade hand tools are used with the proper precautions. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 12. Consider controls to avoid muscular skeletal, repetitive motion, and cumulative trauma stresses. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

General (3.2.1)

- | | | | | |
|--|--------------------------|--------------------------|--------------------------|--------------------------|
| 13. PPE is selected and used according to tool-specific hazards anticipated. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 14. Tools are tested daily to assure safety devices are operating properly. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 15. Damaged tools are removed from service until repaired. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 16. Power operated tools designed to accommodate guards and used. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 17. Rotating or moving parts on tools are properly guarded. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 18. Machines designed for fixed locations are secured or anchored. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 19. Floor and bench-mounted grinders are provided with work rests. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 20. Guards are provided at point of operation, nip points, rotating parts. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 21. Fluid used in hydraulic-powered tools is approved fire-resistant fluid. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

Electric-Powered Tools (3.2.2)

- | | | | | |
|---|--------------------------|--------------------------|--------------------------|--------------------------|
| 23. Electric cords are not used for hoisting or lowering tools | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 24. Hand-held tools are equipped with appropriate on/off controls. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 25. Electric tools used in damp/wet locations are approved or use GFCI. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 26. Portable, power-driven circular saws are equipped with proper guards. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

Abrasive Wheel Tools (3.2.3)

- | | | | | |
|---|--------------------------|--------------------------|--------------------------|--------------------------|
| 27. Employees using abrasive wheel tools are wearing eye protection. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 28. Grinding machines are supplied with sufficient power to maintain spindle speed. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 29. Abrasive wheels are closely inspected and ring-tested before use. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 30. Grinding wheels are properly installed. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 31. Cup-type wheels for external grinding are protected by proper guard. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 32. Portable abrasive wheels used for internal grinding are protected by safety flange. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 33. Safety flanges are used only with wheels designed to fit the flange. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 34. Safety guards on abrasive wheel tools are mounted properly. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

Pneumatic-Powered Tools (3.2.4)

- | | | | | |
|---|--------------------------|--------------------------|--------------------------|--------------------------|
| 35. Tools are secured to hoses or whip by positive means to prevent disconnect. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 36. Safety clips or retainers are installed to prevent attachments being | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

expelled.

- | | | | | |
|--|--------------------------|--------------------------|--------------------------|--------------------------|
| 37. Safety devices are installed on automatic fastener feed tools. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 38. Compressed air is not used for cleaning unless reduced to <30 psi, with PPE and guarded. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 39. Manufacturer's safe operating pressure for hoses, pipes, valves, are not exceeded. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 40. Hoses >1/2 inch diameter have safety device at source to reduce pressure upon hose failure. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 41. Airless spray guns have required safety devices installed. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 42. Blast cleaning nozzles are equipped with operating valves, which are held open manually. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 43. Supports are provided for mounting nozzles when not in use. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 44. Air receivers drains, handholes, and manholes are easily accessible. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 45. Air receivers are equipped with drainpipes, and valves for removal of Accumulated oil and water. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 46. Air receivers are completely drained at required intervals. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 47. Air receivers are equipped with indicating pressure gauges. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 48. Safety valves are tested at regular intervals for assure good operating condition. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 49. Safety, indicating, and controlling devices are installed as required. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| <u>Liquid Fuel-Powered Tools (3.2.5)</u> | | | | |
| 50. Liquid fuel-powered tools are stopped when refueling, servicing, or for maintenance. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 51. Liquid fuels are stored, handled, and transported in accordance with SOP HS-21. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 52. Liquid fuel-powered tools are used in confined spaces in accordance with SOP HS-17 | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 53. Safe operating pressures of hoses, valves, pipes, filters, and other Fittings are not exceeded. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| <u>Jacking Tools (3.2.6)</u> | | | | |
| 54. Rated capacities are legibly marked on jacks and not exceeded. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 55. Jacks have a positive stop to prevent over-travel. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 56. Base of jacks are blocked or cribbed to provide a firm foundation. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 57. Wood blocks are placed between the cap and load to prevent slippage. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 58. After load is raised, it is cribbed, blocked, or otherwise secured Immediately. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 59. Antifreeze is used when hydraulic jacks are exposed to freezing temperatures. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

- | | | | | |
|--|--------------------------|--------------------------|--------------------------|--------------------------|
| 60. Jacks are properly lubricated. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 61. Jacks are inspected as required. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 62. Repair or replacement parts are examined for possible defects. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 63. Jacks not working properly are removed from service and repaired. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| <u>Hand Tools(3.2.7)</u> | | | | |
| 64. Wrenches are not used when jaws are sprung to the point of slippage. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 65. Impact tools are kept free of mushroomed heads. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 66. Wooden handles of tools are kept free of splinters or cracks and are tightly fitted in tool. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

XXXV. CONCRETE AND MASONRY

Safe Work Practices (3.1)

- | | | | | |
|--|--------------------------|--------------------------|--------------------------|--------------------------|
| 1. Personnel on areas where concrete is being poured are wearing PPE. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 2. Protruding rebar is adequately guarded to control impalement hazards. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 3. Personnel do not ride concrete buckets or position themselves in lifting areas. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 4. Personnel maintain safe distance from formwork, shoring, percast, and lift-slab operations. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 5. Personnel do not enter limited access zones during masonry wall work. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 6. Personnel are not permitted under loads being lifted or walls being jacked. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 7. Personnel access is limited in areas where post-tension operations are performed. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

General (3.2.1)

- | | | | | |
|--|--------------------------|--------------------------|--------------------------|--------------------------|
| 8. Concrete structures where loads to be placed, inspected. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 9. Protruding rebar, guarded. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 10. No employees permitted behind jack during tensioning unless directly involved in the operation | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 11. Signs/barriers are erected to limit employee access to post tension areas. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

Tools, Materials, and Equipment

- | | | | | |
|--|--------------------------|--------------------------|--------------------------|--------------------------|
| 15. Requirements for confined space entry and lockout/tagout are met. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 16. Concrete mixers have cleaning devices and guards installed. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 17. Portable/rotating concrete troweling machines have shutoff devices. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 18. Concrete buggy handles do not extend beyond the wheels on either side. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

- | | | | | |
|---|--------------------------|--------------------------|--------------------------|--------------------------|
| 19. Concrete pumping systems using discharge pipes are supported. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 20. Concrete buckets w/hydraulic or pneumatic gates have positive lock. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 21. Employees not permitted under concrete buckets during lifts and lowers. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 22. Elevated concrete buckets are routed around employees. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 23. Employees do not ride concrete buckets. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 24. Sections of tremies or similar concrete conveyances are secured with wire rope. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 25. Bull float handles were contact with electrical lines, are nonconductive. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 26. Masonry saws are guarded with a semicircular enclosure over the blade. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 27. Employees applying concrete through a hose are wearing PPE. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| <u>Formwork and Shoring (3.2.3)</u> | | | | |
| 28. Formwork is capable of supporting loads that may be reasonably anticipated to be applied. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 29. Drawings and plans required to be at the jobsite are available. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 30. Shoring equipment is inspected prior to erection. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 31. Damaged shoring equipment is not used. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 32. Erected shoring is inspected prior to, during, and immediately after concrete placement. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 33. Sills from shoring are sound, rigid, and capable of carrying the maximum intended load. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 34. Base plates, shore heads, extension devices, and adjustment screws are installed correctly. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 35. Eccentric loads on shore heads and similar are prohibited unless designed for such loads. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 36. Whenever single-post shores are tiered, shoring is designed and inspected | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 37. Tiered single-post shores are vertically aligned and adequately braced. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 38. Adjustment of single-post shores to raise framework is not made after placement of concrete. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 39. Re-shoring is erected when concrete is required to support loads in excess of its capacity | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 40. Forms/shores are only removed when concrete has gained sufficient strength as needed. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 41. Re-shoring is not removed until concrete being supported has attained adequate strength to support its weight and all loads placed upon it. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |