Americas

Surface Sediment Sampling Project-Specific HASP Addendum

Location: Surface Sediment Sampling Study Area

Date: March 29, 2018

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Approved By: Jennifer Pretare (AECOM), Fred Merrill (AECOM)

Summary of Surface Sediment Sampling

Surface (0 to 30 centimeter) sediment samples at 659 locations will be collected via a Van Veen hydraulic power grab sampler operated from two aluminum research vessels (RV *Cayuse* [24-foot] and RV *Tieton* [26-foot]) operated by Gravity, a subcontractor to AECOM. All vessel operations and sediment sampling equipment will be operated by Gravity. Gravity will be responsible for operating the following equipment:

- Research vessel (RV *Cayuse* and RV *Tieton*)
- Van Veen power grab sampler

AECOM and Geosyntec staff will provide on-board oversight, document the sampling process, and conduct on-board sample processing of surface sediment samples. On-board sample processing will involve transferring sediment samples to a tub where the sample will be homogenized using a battery-operated hand drill and paint mixer, then transferring samples to smaller containers for transport to the on-shore processing facility for further sample processing, after which they will be shipped to the lab for analysis. Additional AECOM staff will conduct on-shore processing, packaging, and shipping of the samples at AECOM's on-shore facility.

It is assumed that work crews will work 12-hour days for 2 months (with 4 contingency days). Rest days are built in to the schedule. A fatigue management plan will be created if the duration of work exceeds a 14-hour day.

Team Leads and Supervisors

Organization	Job Title/Role	Name	Cell Phone
Geosyntec	Senior Technical Lead	Anne Fitzpatrick	(b) (6)
AECOM	Site Safety Officer Project Field Coordinator	Nicky Moody	
AECOM	Site Safety Officer	Dave Hose	
Geosyntec	Project Field Coordinator	Keith Kroeger	
Geosyntec	Project Chemist	Julia Klens-Caprio	
AECOM	Project Chemist	Amy Dahl	

Supplemental List of Personnel, Short-Service Employees (SSE), Subcontractors and their Safety Officers
(*from Programmatic HASP Summary: the Project-Specific HASPs will list all short-service employees, including subcontractors that are scheduled to participate in Project activities*)

Organization	Job Title/Role	Name	Cell Phone	SSEs and Safety Officers
Gravity	Gravity Project Manager	Shawn Hinz	(b) (6)	Safety Officer
Gravity	Captain	Mike Duffield		
Gravity	Captain	Rene Trudeau		
Gravity	Captain	Peter Jenkins		
Gravity	Captain	John Schaefer		
Gravity	Deckhands/Scientist	Jeff Wilson		
Gravity	Deckhands/Scientist	Jeff Schut		
Gravity	Deckhands/Scientist	Chad Furulie		
AECOM	Scientist	Mark Tauscher		
AECOM	Scientist	Michaela McCoog		
AECOM	Scientist	Jeremy Haney		SSE (Mentor: Nicky Moody)
AECOM	Scientist	Bruce Cassem		
Geosyntec	Scientist	Jennifer Arblaster		
Geosyntec	Scientist	Alison Clements		

Supplemental List of Hazard Materials
(*from Section 3.7 Hazard Communications: Hazardous materials that may be encountered as existing environmental or physical/health contaminants will be addressed in the Project-Specific HASPs that will be appended to this Programmatic HASP. The Supervisor or Safety Officer will maintain copies of all SDS on-site and in Project-Specific HASPs appended to this HASP (as Attachment 1). SDS may not be available for locally obtained products, in which case an alternate form of product hazard documentation will be acceptable*)

Hazard Materials
Methanol
Alconox
Nitric acid

Housekeeping and Personal Hygiene

(*from Section 3.9 Housekeeping and Personal Hygiene: Designated Safety Officer for individual study (to be designated in Project-Specific HASPs)*

Designated Safety Officer	Organization	Cell Phone
Nicky Moody	AECOM	(b) (6)

Supplemental List of Competent Persons

(*from Section 5.3.1 Competent Persons: To be identified in the Project-Specific HASP Addendum*)

Operations	Organization	Job Title/Role	Name	Cell Phone
Safe Vessel Operations	Gravity	Captain	Mike Duffield	(b) (6)
Safe Vessel Operations	Gravity	Captain	Rene Trudeau	
Safe Vessel Operations	Gravity	Captain	Peter Jenkins	
Safe Vessel Operations	Gravity	Captain	John Schaefer	

Supplemental List of CPR/First Aid/AED Trained Personnel

(*from Section 12.4 CPR/First Aid/AED Trained Personnel that will be on-site will be identified in the Project-Specific HASPs for each study*)

Organization	Job Title/Role	Name	Cell Phone	Training
AECOM	Site Safety Officer Project Field Coordinator	Nicky Moody	(b) (6)	CPR, First Aid, and AED
AECOM	Scientist	Mark Tauscher		CPR, First Aid, and AED
AECOM	Scientist	Michaela McCoog		CPR, First Aid, and AED
AECOM	Scientist	Bruce Cassem		CPR, First Aid, and AED
Geosyntec	Scientist	Alison Clements		CPR, First Aid, and AED

HASP Addendum Attachments:

Attachment 1. AECOM Pre-Job Hazard Assessment
Attachment 2. Gravity Health and Safety and Environmental Plan
Attachment 3. Vessel Diagrams
Attachment 4. Safety Data Sheets

Pre-Job Hazard Assessment

S3AM-209-FM4

Principal Activities	Potential Safety/Health Hazards	Initial Risk Rating	Control Measures	Final Risk Rating
List principal activities involved in the scope of work	Identify each safety or health hazard		Identify engineering and administrative controls and any specific Personal Protective Equipment (PPE) that is required	
ACTIVITY 1 – Mobilize equipment and personnel to study area.	Traffic/driving hazards	10	• All AECOM drivers must have current driver awareness training (available on AECOM University). • All drivers must have current, valid driver's license on their person. • Complete pre-use visual inspection. Wa k around the vehicle to inspect for potential hazards or mechanical issues before driving. • Practice defensive driving and drive in a courteous manner. • Seat belts must be worn by the driver and all passengers. • Obey all speed limits. • Drivers must not use cellular telephones or other communication devices such as two-way radios unless safely parked. • Window surfaces must be cleared of any materials such as ice, frost, mud, or water that can impair visibility. • Travel with headlights on at all times. • Travel during daylight hours when possible. • Equip vehicles with: first aid kit, fire extinguisher, flares or triangle, spare tire and jack, cell phone. • The project goal is to limit activities to no more than 10 hours/day; contact project manager if work days extend beyond the 10 hours.	5
	Fatigue	15	• Extended workdays can be granted; however, workdays shall not exceed 14 hours and extended work weeks, 60 hours/week. • For emergency work, a single shift should be limited to 16 hours, and an employee should be off work for at least 12 hours before the next shift starts. If shift work is required, employees should be given sufficient time to get a continuous 7- to 8-hour period of sleep in each 24 hours, and at least 50 hours every 7 days.	3

Attachment 1. AECOM Pre-Job Hazard Assessment

Principal Activities	Potential Safety/Health Hazards	Initial Risk Rating	Control Measures	Final Risk Rating
			• Safety Officer and team members will watch and intervene when individuals appear to be fatigued; contact the project manager if a team member appears fatigued. • Night work will not occur on this project. • A journey management plan will be established for team members traveling >250 miles.	
	Parking hazards	10	Park in a clear location, back in to parking location to avoid backing out upon departure.	3
	Lifting hazards/muscle strain	6	• Practice proper lifting and manual handing of materials and equipment, lift with the knees, avoid twisting, and seek assistance or employ additional handling equipment as needed. • Wear abrasion gloves and safety-toed boots when moving equipment. • No personnel should lift more than 50 pounds without assistance or mechanical aid. Request assistance below 50 pounds as necessary. Know what items weigh before lifting or test them carefully.	3
ACTIVITY 2– Load personnel and equipment onto vessel.	Lack of knowledge of tasks being performed	10	Discuss tasks to be performed by personnel, potential hazards, and control measures.	1
	Water hazards	10	• Follow all appropriate water safety rules and regulations. • Wear Type III or V Personal Flotation Device (PFD) or life jacket.	4
	Severe weather	9	Assess severe weather hazards using National Oceanic and Atmospheric Administration (NOAA) resources before on-water work: • Stop work if lightning is <6 miles away (<30 seconds between lightning flash and hearing thunder). If storm is approaching, do not wait for it to arrive before implementing stop work action. • Stop Work during wind gusts sustained at 25 mph, and at all times where debris is visible flying in air. • Stop work during hail storms; seek shelter inside building or wheelhouse/vessel cabin.	1

Attachment 1. AECOM Pre-Job Hazard Assessment

Principal Activities	Potential Safety/Health Hazards	Initial Risk Rating	Control Measures	Final Risk Rating
	Lifting hazards/muscle strain	10	• Practice proper lifting and manual handing of materials and equipment, lift with the knees, avoid twisting, and seek assistance or employ additional handling equipment as needed. • Wear abrasion gloves when moving equipment. • No personnel should lift more than 50 pounds without assistance or mechanical aid. Request assistance below 50 pounds as necessary. Know what items weigh before lifting or test them carefully. • Transfer equipment to people on boat rather than carrying equipment onto boat.	3
	Vessel boarding hazards	10	• Receive vessel operator's training prior to boarding vessel. • Follow vessel operator's instructions for boarding vessel. • Wear appropriate PPE, including correct type of PFD. • Maintain three points of contact when boarding vessel. • Follow vessel operator's instructions for loading equipment onto vessel.	4
	Pinch points/hand injuries	8	Be aware of hands, feet, arms, and position of all personnel during tool use and equipment handling. Never position a hand where it can be pinched Examples include: • Between lines under tension and hard surfaces • Between vessel and dock • Between equipment and hard surfaces on vessel	4
	Slips, trips, and falls	8	• Wear appropriate footwear with non-slip soles. • Ensure pathways are clear and free of obstruction prior to initiating work, ensure all lines are secure prior to initiating work, and adhere to proper housekeeping practices. • Maintain three points of contact when boarding vessel.	4
ACTIVITY 3 – Work aboard a research vessel on water.	Slips, trips, and falls	8	• Wear appropriate footwear with non-slip soles. • Ensure pathways are clear and free of obstruction prior to initiating work, ensure all lines are secure prior to initiating work, and adhere to proper housekeeping practices. • Maintain three points of contact at all times.	4
	Fatigue	12	• Extended workdays can be granted; however, workdays shall not exceed 14 hours and extended	2

Attachment 1. AECOM Pre-Job Hazard Assessment

Principal Activities	Potential Safety/Health Hazards	Initial Risk Rating	Control Measures	Final Risk Rating
			work weeks, 60 hours/week. • For emergency work, a single shift should be limited to 16 hours, and an employee should be off work for at least 12 hours before the next shift start. If shift work is required, employees should be given sufficient time to get a continuous 7- to 8-hour period of sleep in each 24 hours, and at least 50 hours every 7 days. • Safety Officer and team members will watch and intervene when individuals appear to be fatigued; contact the project manager if a team member appears fatigued. • Night work will not occur on this project.	
	Lines and equipment under tension creating line of fire or pinch point	9	• Keep body away from lines under tension. • Keep as much distance as poss ble between you and any source of potential energy release.	2
	Moving parts/pinch points/hand injurieS	9	• Be aware of hands, feet, arms, and position of all personnel during tool use and equipment handling. • Never position a hand where it can be pinched if hatch closes, a load releases, or a tool slips.	2
	Water hazards	10	• Vessel operator will provide a SH&E Orientation on boating operations prior to departing dock, which will cover the following: man overboard, power loss/disabled boat, fire onboard, medical emergency. • Vessel operator will perform a vessel inspection prior to departure. • Vessel operator will submit a float plan to the Project Manager (Jenny Pretare) and follow the float plan and communication plan identified in the float plan. • Passengers will obey vessel operator's orders at all times. • Adhere to all federal, state, and local boating and licensing laws. • Work must be performed in accordance with the "Buddy System." • PPE: US Coast Guard (USCG)-approved Type III or V PFD or life jacket, sized and adjusted to the wearer, shall be worn by all workers when aboard the research vessel. • Confirm vessel has secondary means of propulsion	2

Attachment 1. AECOM Pre-Job Hazard Assessment

Principal Activities	Potential Safety/Health Hazards	Initial Risk Rating	Control Measures	Final Risk Rating
			such as oars or paddles or backup motor. • Workers are to remain seated when vessel is in motion. Avoid standing in vessel whenever possible.	
	Man overboard (MOB)/incapacitated person	10	Vessel operator will provide a SH&E Orientation on boating operations prior to departing dock, which will cover the following: man overboard, power loss/disabled boat, fire onboard, medical emergency. Vessel operator will review USCG MOB procedures: • No low visibility/night operations will occur. • When deploying equipment, do not lean over the boat. • When boat is underway, all people must remain in the cabin, seated or standing, while maintaining four points of contact; no work on deck may occur. • All staff aboard vessel will be trained in MOB recovery training. • Perform safety briefing prior to departure and discuss MOB recovery procedure. • Wear Type III or V PFD AT ALL TIMES on board a boat or on dock. • Person who observes person fall overboard must keep their eyes on him/her. • Immediately cease work operations and commence a rescue procedure. • Bring the vessel to the position of the person in the water (as opposed to having the person swim to the boat). • Immediately mark MOB location on GPS by "one-button *MOB* press." • Throw a MOB pole marker/raise a MOB flag into the water to denote the location of the person overboard and to alert other boat traffic. • Throw PFDs or other floatable items into the water to assist the person overboard. • Send a distress call on VHF Channel 16 if person is un-responsive or severely injured.	3
	Vessel in danger of sinking	10	Vessel operator will be responsible for emergency actions and notifications; however, if the vessel crew is incapacitated the following procedure shall be followed: • Send a distress call: PAN call over VHF Channel 16 if boat is not in imminent danger. • Send a Mayday distress call and repeat until	4

Attachment 1. AECOM Pre-Job Hazard Assessment

Principal Activities	Potential Safety/Health Hazards	Initial Risk Rating	Control Measures	Final Risk Rating
			message is received over VHF Channel 16 if boat is in imminent danger. o Provide name of vessel o Provide description of vessel o Provide location of vessel (e.g., latitude/longitude, river mile, landmark, etc. o Provide count of onboard passengers. o Provide nature of distress. o Descr be kind of assistance needed. • Turn on the bilge pump to begin pumping water to outside of boat. • Assemble the emergency pump and begin pumping water.	
	Vessel fire	10	• Remove all flammable material from ignition sources. • Communicate with Safety Officer and vessel operator if there will be any new flammable material brought onboard; store only in approved containers. Review SDS for firefighting procedures. • Review fire extinguisher location and quantity and confirm fire extinguishers are charged prior to leaving dock • Remember P.A.S.S: o **P**ull the Pin o **A**im the fire extinguisher at the base of the fire o **S**queeze the handle o **S**weep the base of fire side to side • Send a Mayday distress call and repeat until message is received over VHF Channel 16 if boat is in imminent danger. o Provide name of vessel o Provide description of vessel o Provide location of vessel (e.g., latitude/longitude, river mile, landmark, etc. o Provide count of onboard passengers. o Provide nature of distress. o Descr be kind of assistance needed. • Inflate life raft/abandon vessel if necessary (e.g., risk of explosion).	3
	Medical emergency	8	Vessel operator will review location of first aid kit and AED prior to departing the dock. The vessel operator or his/her designee will review how the AED operates with	2

Attachment 1. AECOM Pre-Job Hazard Assessment

Principal Activities	Potential Safety/Health Hazards	Initial Risk Rating	Control Measures	Final Risk Rating
			the crew prior to departing dock. • Review first aid kit location and contents prior to departure. • If a severe injury occurs, initiate a MAYDAY call. • Travel to Swan Island or location identified by responding EMS. • After emergency has been addressed, contact project manager and AECOM reporting line (1-800-348-5046).	

	Heat stress/cold stress	9	• Begin heat stress/cold stress monitoring as applicable and continue throughout duration of task.
			• Implement heat stress/cold stress prevention procedures, as applicable.
			• Heat stress: drink 8 oz water/hour and use appropriate work/rest schedule as specified in Heat Stress AECOM SH&E Procedure.
			• Cold Weather PPE (<50 degrees F):
			  ○ Layers of non-cotton clothing; examples include down, wool, or other synthetic materials to provide insulation when wet
			  ○ Outer layer to break the wind
			  ○ Hat or hardhat liner
			  ○ Insulated footwear/extra socks if boots allow
			  ○ Gloves which allow for insulation and dexterity
			  ○ Hand warmers
			  ○ Emergency set of dry clothing stored in waterproof bag
				5

	Severe weather	9	• Assess severe weather hazards using NOAA resources before on-water work • Stop work if lightning is <6 miles away (<30 seconds between lightning flash and hearing thunder). If storm is approaching, do not wait for it to arrive before implementing stop work action. • Stop Work during wind gusts sustained at 25 mph, and at all times where debris is visible flying in air. • Stop work during hail storms; seek shelter inside building or wheelhouse/vessel cabin.	1
	Other commercial/recreational vessel traffic hazards	10	Adhere to all federal, state, and local boating and licensing laws.	3
ACTIVITY 4 – Use a Van Veen clamshell grab system to collect the	Clamshell operation (Van Veen system)	10	• Verify that operator is qualified and working in a safe manner.	3

Attachment 1. AECOM Pre-Job Hazard Assessment

Principal Activities	Potential Safety/Health Hazards	Initial Risk Rating	Control Measures	Final Risk Rating
surface sediment samples.			• Ensure that all personnel are familiar with the location of the Emergency Shut-off switches prior to operation and maintain a suitable distance from the operating equipment. • Clamshell (Van Veen) operator needs to complete equipment inspection form daily prior to initiating study activities. • Use appropriate PPE (safety glasses, hard hats, nitrile gloves, abrasion resistant gloves when handling heavy items and rubber safety toed boots. Boot covers can be worn over leather safety-toed boots. If a splash hazard exists, use disposable Tyvek or other impermeable clothing which can be washed and rinsed. Wear Type III or V PFD)	
	Moving parts/pinch points/hand injuries	8	Be aware of hands, feet, arms, and position of all personnel during tool use and equipment handling. Never position a hand where it can be pinched if a wheel rotates, a load releases, or a tool slips.	4
ACTIVITY 5 – Process samples on board vessel. Sediment sample will be transferred to a tub, and a drill and paint mixer will be use to homogenize the sample. Smaller samples will then be transferred to sample containers and stored until transported to shore for further processing.	Power tools	6	• Employees should work only with tools with which they are appropriately trained and familiar and should receive specific instruction on use and operation of unfamiliar tools. • Use tools only for their designated use and in accordance with manufacturer's specifications. • Use approved tools only. Never modify or use makeshift tools. • Ensure proper ergonomics principles are observed when using power tools. • Avoid placing fingers in danger zones; ensure sufficient clearance in the event the tool slips. • Secure tools when not in use. • Do not allow loose clothing, long hair, loose jewelry, or rings and chains to be worn when working with power tools.	2

	Potential contaminant exposure	9	• The decontamination procedure described in the field sampling plan and summarized below will be followed:
			  ○ Rinse equipment with river water
			  ○ Any water or sediment will be washed into the surface waters near the vicinity of the collection site before proceeding to the next station.
			  ○ Liquinox (or alternate phosphate-free detergent-bearing liquid wastes from
				3

Attachment 1. AECOM Pre-Job Hazard Assessment

Principal Activities	Potential Safety/Health Hazards	Initial Risk Rating	Control Measures	Final Risk Rating
			decontamination) will be used to decontaminate equipment which contacts sediment and will be washed overboard o Rinse with distilled water • Remove and dispose of nitrile gloves following decontamination procedure. • PPE: safety glasses, hard hats if overhead hazard exists, nitrile gloves, abrasion resistant gloves when handling heavy items and rubber safety toed boots. Boot covers can be worn over leather safety-toed boots. If a splash hazard exists, use disposable Tyvek or other impermeable clothing which can be washed and rinsed. Wear Type III or V PFD. • Additional information is found in the Task Specific Field Sampling Plan.	
	Handling and storing acids and solvents	10	• Review SDS for specific chemicals at beginning of activity to confirm HAZCOM procedures are implemented. • Project-specific SOPs for high-volume sampling are provided in Appendix B of the FSP. • Wear appropriate PPE, including nitrile gloves and safety glasses and/or chemical goggles.	3
ACTIVITY 6 – Move sediment samples off vessel by hand once docked.	Lifting hazards/muscle strain/ergonomic hazards	10	• Practice proper lifting and manual handing of materials and equipment, lift with the knees, avoid twisting, and seek assistance or employ additional handling equipment as needed. • Wear abrasion gloves when moving equipment. • No personnel should lift more than 50 pounds without assistance or mechanical aid. Request assistance below 50 pounds as necessary. Know what items weigh before lifting or test them carefully. • Transfer equipment to people on boat rather than carrying equipment onto boat.	3
	Vessel offloading hazards	10	• Follow vessel operator's instructions for leaving vessel. • Maintain three points of contact when leaving vessel. • Follow vessel operator's instructions for transferring equipment and samples off vessel.	3
	Potential contaminant exposure	10	• Use proper tools for decontamination. • If sample containers break or other potential contaminant exposure exists, wear appropriate PPE for cleanup, including safety glasses with side	3

Attachment 1. AECOM Pre-Job Hazard Assessment

Principal Activities	Potential Safety/Health Hazards	Initial Risk Rating	Control Measures	Final Risk Rating
			shields, nitrile gloves, rubber safety-toed boots, or leather safety toed boots with boot covers. use disposable Tyvek or other impermeable clothing which can be washed and rinsed. Wear Type III or V PFD. • Follow other Standard Operating Procedures (SOPs) for decontamination as specified in the Task Specific Field Sampling Plan.	
ACTIVITY 7– Decontaminate equipment.	Lifting hazards/muscle strain	10	• Practice proper lifting and manual handing of materials and equipment, lift with the knees, avoid twisting, and seek assistance or employ additional handling equipment as needed. • Wear abrasion gloves when moving equipment. • No personnel should lift more than 50 pounds without assistance or mechanical aid. Request assistance below 50 pounds as necessary. Know what items weigh before lifting or test them carefully.	3
	Potential contaminant exposure	1	• Use proper tools for decontamination. • PPE: safety glasses, hard hats if overhead hazard exists, nitrile gloves, abrasion resistant gloves when handling heavy items and rubber safety toed boots. Boot covers can be worn over leather safety-toed boots. If a splash hazard exists, use disposable Tyvek or other impermeable clothing which can be washed and rinsed. Wear Type III or V PFD. • Follow other SOPs for decontamination as specified in the Task-Specific Field Sampling Plan.	1
	Handling and storing acids and solvents	10	• Project-specific SOPs for high-volume sampling are provided in Appendix B • Wear appropriate PPE, including nitrile gloves and safety glasses and/or chemical goggles.	3
	Safety and spill equipment	10	A spill response kit, to include an appropriate empty container, materials to allow for booming or diking the area to minimize the size of the spill, and appropriate clean-up material (i.e., speedy dri, absorbent pads, etc.) will be available on the project study area and positioned for quick and easy access.	3
ACTIVITY 8 – Load/transport samples to warehouse for processing.	Lifting hazards/muscle strain/ergonomic hazards	10	• Practice proper lifting and manual handing of materials and equipment, lift with the knees, avoid twisting, and seek assistance or employ additional handling equipment as needed. • Wear abrasion gloves when moving equipment. No personnel should lift more than 50 pounds without assistance or mechanical aid. Request assistance	4

Attachment 1. AECOM Pre-Job Hazard Assessment

Principal Activities	Potential Safety/Health Hazards	Initial Risk Rating	Control Measures	Final Risk Rating
			below 50 pounds as necessary. Know what items weigh before lifting or test them carefully.	
	Driving hazards	10	• All drivers must have current, valid driver's license on their person. • Complete pre-use visual inspection - walk around the vehicle to inspect for potential hazards or mechanical issues before driving. • Practice defensive driving and drive in a courteous manner. • Seat belts must be worn by the driver and all passengers. • Drivers must not use cellular telephones or other communication devices such as two-way radios unless safely parked. • Window surfaces must be cleared of any materials such as ice, frost, mud, or water that can impair visibility. • Equip vehicles with first aid kit, fire extinguisher, flares or triangle, spare tire and jack, and cell phone. • Ensure all loads are properly secured.	5
ACTIVITY 9 – Process sediment samples at warehouse.	Potential contaminant exposure	10	• Maintain awareness of potential contaminant exposure and implement avoidance procedures. • Use appropriate PPE: (safety glasses with side shields or chemical goggles if handling preservatives with nitrile gloves. If handling heavy items, abrasion resistant gloves and rubber safety-toed boots. Boot covers can be worn over leather safety-toed boots. If a splash hazard exists, use disposable Tyvek or other impermeable clothing which can be decontaminated). • Use proper tools for decontamination. • Follow other SOPs for decontamination as specified in the Task-Specific Field Sampling Plan.	3
	Safety and spill equipment	10	A spill response kit, to include an appropriate empty container, materials to allow for booming or diking the area to minimize the size of the spill, and appropriate clean-up material (i.e., speedy dri, absorbent pads, etc.) will be available on the project study area and positioned for quick and easy access.	3
	Handling acid and solvents used for cleaning high volume sampling supplies	10	• Project-specific SOPs for high-volume sampling are provided in Appendix B of the FSP. • Use appropriate PPE: (safety glasses with side shields or chemical goggles if handling preservatives with nitrile gloves. If handling heavy items, abrasion	3

Attachment 1. AECOM Pre-Job Hazard Assessment

Principal Activities	Potential Safety/Health Hazards	Initial Risk Rating	Control Measures	Final Risk Rating
			resistant gloves and rubber safety-toed boots. Boot covers can be worn over leather safety-toed boots. If a splash hazard exists. Use disposable Tyvek or other impermeable clothing which can be decontaminated).	
ACTIVITY 10 – Ship sediment samples to lab for processing.	Lifting hazards/muscle strain	10	• Practice proper lifting and manual handing of materials and equipment, lift with the knees, avoid twisting, and seek assistance or employ additional handling equipment as needed. • Wear abrasion gloves when moving equipment. • No personnel should lift more than 50 pounds without assistance or mechanical aid. Request assistance below 50 pounds as necessary. Know what items weigh before lifting or test them carefully.	3
	Driving hazards	10	• All drivers must have current, valid driver's license on their person. • Complete pre-use visual inspection. Wa k around the vehicle to inspect for potential hazards or mechanical issues before driving. • Practice defensive driving and drive in a courteous manner. • Seat belts must be worn by the driver and all passengers. • Drivers must not use cellular telephones or other communication devices such as two-way radios unless safely parked. • Window surfaces must be cleared of any materials such as ice, frost, mud, or water that can impair visibility. • Equip vehicles with first aid kit, fire extinguisher, flares or triangle, spare tire and jack, and cell phone. • Ensure all loads are properly secured.	5

SPECIAL REQUIREMENTS

Step #	Equipment to be Used	Inspection Requirements	Training Requirements
	List equipment to be used in work activity	List inspection/permit requirements for work activity	List training requirements including hazard communication
1.	Research vessel	Perform boat inspection prior to use. Complete and submit float plan prior to use.	USCG-licensed vessel operator or equivalent. MOB recovery with limited assistance. First Aid/CPR Training. Approved boating safety course. HAZWOPER 40-hour with 8-hour refresher
2.	Van Veen clamshell grab system	Daily inspection before use. Machinery and mechanized equipment inspection form completed prior to project start.	Employees operating equipment shall be experienced or trained in the specific use of the equipment for the purpose of the sampling effort. Only Gravity crew will operate clamshell grab system. HAZWOPER 40-hour with 8-hour refresher
3.	Power tools (drill and paint mixer)	Inspect prior to use. Do not use any tool that is defective or has missing parts.	Employees operating power tools shall be familiar with the use and operation of the equipment or have received specific instruction on its use and operation.
4.	Emergency equipment provided by vessel operator (Gravity): • GPS • Satellite phone (if cell phone service does not cover entire survey area) • VHF radios will remain on Channel 16 (for hailing/distress calls) at all times to listen for boat traffic, alerts, etc. unless actively keying/ communicating on another channel with another party • Rescue rope in throw bag (commercially available) • Air horns and/or whistles • Waterproof flashlight • *Secondary "kicker" motor and *alternate means of propulsion (oars or paddles) • *Bailer (if bilge pump is not provided, bucket, or similar device should be on board) • *Duct tape • *Length of rope for securing boat on shore or alongside larger vessel • *Functional bilge pump/emergency pump • *Anchor with five to seven times as much line as the depth of water plus the distance from the surface of the water to where the anchor will attach to the bow • *Type 4 throwable ring or cushion • *Type BC fire extinguisher (10 pound) if extra fuel is carried in portable containers. * Required minimum equipment to be provided by vessel	Inspect all equipment for battery life and integrity during the pre-trip boat inspection.	Personnel should be familiar with all emergency equipment.

	provider (chartered boat); project Field Coordinator to ensure remaining equipment is carried on board.		
5.	Photoionization detector (PID)	Daily Calibration	Training in PID usage
6.	Click here to enter text.	Click here to enter text.	Click here to enter text.
7.	Click here to enter text.	Click here to enter text.	Click here to enter text.
8.	Click here to enter text.	Click here to enter text.	Click here to enter text.
9.	Click here to enter text.	Click here to enter text.	Click here to enter text.

INSTRUCTIONS AND RISK MATRIX

Hazard Evaluation – Identify principal steps of the task. Identify potential safety/health hazards for each step and determine initial risk rating using the matrix provided below. Identify control measures including PPE for each hazard. Re-evaluate hazard potential and assign a final risk rating. If the final risk rating is a 5-9 (medium risk) or 10-25 (high risk), additional hazard controls shall be identified and applied until the final risk rating is reduced to 4 or below. The final risk rating cannot be reduced to 4 or lower, additional approvals are needed before the activity can begin. Add additional rows as required to cover all major steps/aspects of the activity.

Special Requirements – Identify equipment to be used including specific PPE required. Identify inspection requirements such as competent person, permit issue, documented task hazard analysis, etc. Identify training requirements such as hazard communication, scaffold user, fall protection, etc.

High ← → Low

Probability	Severity				
	5 - Catastrophic	4 - Critical	3 - Major	2 - Moderate	1 - Minor
5 - Frequent	25	20	15	10	5
4 - Probable	20	16	12	8	4
3 - Occasional	15	12	9	6	3
2 - Remote	10	8	6	4	2
1 - Improbable	5	4	3	2	1

High ↑ ↓ Low

10-25 (red) are high risk, 5-9 (yellow) are medium risk, and 1-4 (green) are low risk

Severity – Potential Consequences				
	People	Property Damage	Environmental Impact	Public Image/Reputation
Catastrophic	Fatality, Multiple Major Incidents	>$1M USD, Structural collapse	Offsite impact requiring remediation	Government intervention
Critical	Permanent impairment, Long term injury/illness	>$250K to $1M USD	Onsite impact requiring remediation	Media intervention
Major	Lost/Restricted Work	> $10K to $250K USD	Release at/above reportable limit	Owner intervention
Moderate	Medical Treatment	> $1K to $10K USD	Release below reportable limit	Community or local attention
Minor	First Aid	</=$1K USD	Small chemical release contained onsite	Individual complaint

Probability		
Frequent	Expected to occur during task/activity	9/10
Probable	Likely to occur during task/activity	1/10
Occasional	May occur during the task/activity	1/100
Remote	Unl kely to occur during task/activity	1/1,000
Improbable	Highly unlikely to occur, but possible during task/activity	1/10,000

Risk Rating (Probability x Severity)	Risk Acceptance Authority
1 to 4 (Low)	Risk is tolerable, manage at local level
5 to 9 (Medium)	Risk requires approval by Operations Lead/Supervisor & SH&E Manager
10 to 25 (High)	Risk requires the approval of the Operations Manager & SH&E Director

Attachment 2

HEALTH AND SAFETY AND ENVIRONMENTAL PLAN
Portland Harbor RI/FS 2018 studies

Gravity Consulting LLC

Updated February 2018

Prepared for:

Prepared by:

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Gravity Consulting, L.L.C. Project Manager

Shawn Hinz

Jeff Wilson, Gravity Consulting, L.L.C. Health and Safety Manager

The information in this Health and Safety Plan has been designed for the methods presently contemplated by Gravity Consulting L.L.C. (Gravity) for execution of the proposed work. Therefore, this document may not be appropriate if the work is not performed by or using the methods presently contemplated by Gravity. In addition, as the work is performed, conditions different from those anticipated may be encountered and this document may have to be modified. Therefore, Gravity only makes representations or warranties as to the adequacy of the Health and Safety Plan for currently anticipated activities and conditions.

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Acronyms and Abbreviations

ACGIH	American Conference of Governmental Industrial Hygienists
ANSI	American National Standards Institute
COC	Contaminants of Concern
CRZ	Contamination Reduction Zone
DOT	Department of Transportation
ERCP	Emergency Response and Contingency Plan
EZ	Exclusion Zone
GFCI	Ground Fault Circuit Interrupter
HASP	Health and Safety Plan
HSR	Health and Safety Representative
IDLH	Immediately Dangerous to Life or Health
JSA	Job Safety Analysis
LO/TO	Lockout/Tagout
MSDS	Material Safety Data Sheet
NIOSH	National Institute for Occupational Safety and Health
OSHA	Occupational Safety and Health Administration
PEL	Permissible Exposure Limit
PHSM	Project Health and Safety Manager
PM	Project Manager
PPE	Personal Protective Equipment
REL	Recommended Exposure Limits
SHSO	Site Health and Safety Officer
SM	Site Manager
SS	Site Supervisor
SSO	Site Safety Officer
SZ	Support Zone
TLV	Threshold Limit Values

1.0 Introduction

This Health and Safety Plan's (HASP) objective is to help establish safe working conditions at the site Portland Harbor Study Site. Safety procedures and protective equipment are chosen according to potential hazards. Specific hazard control methods have been evaluated and selected to minimize the potential of accident or injury.

This HASP prescribes the procedures that must be followed during specific site activities. Operational changes that could affect the health and safety of personnel, the community, or the environment will not be made without the prior approval of the Project Manager (PM) and the Project Health and Safety Manager (PHSM).

The provisions of this plan are mandatory for all personnel and subcontractors assigned to the project. All visitors to the work site must abide by the requirements of this plan. All project participants will attend a pre-job briefing where the contents of this HASP will be discussed. Project staff assigned to this project must sign the Agreement and Acknowledgement Sheet (see Appendix A) to confirm that they understand and agree to abide by the provisions of this plan.

All work will comply with the Occupational Safety and Health Act (OSHA) standard, "Hazardous Waste Operations and Emergency Response" (29 CFR 1910.120) and other federal, state, and local procedures that require the development and implementation of a HASP. Generation of this document certifies that the workplace has been evaluated for hazards. A hazard assessment has been performed and the adequacy of the personal protective equipment (PPE) selected was evaluated as required by 29 CFR 1910.132(d), 1910.134, 1926.25, and 1926.55, and is duly noted by the signature(s) and date appearing on the cover page of this document.

1.1 Site Description/Background Information

The PDI study area encompasses the in-river portion of an approximately 27-mile stretch of the Willamette River within Portland Harbor, from approximately RM 1.9 to RM28.4. Project specific information is included in the AECOM Sampling and Analysis plan and HASP.

1.2 Scope of Work

This plan addresses health and safety issues involved with environmental monitoring, sediment, and water characterization.

1.3 Key Safety Personnel

The following people share responsibility for health and safety at the site. See Section 1.3.1 for a description of the role and responsibility of each.

Gravity Project Manager: *Shawn Hinz.*	Office: 425-888-8256 Cellular: (b) (6)
Gravity Site Supervisor: *Chad Furulie*	Office: 206-905-9617 Cellular: (b) (6)
Gravity Site Health and Safety Officer: *Jeff Wilson*	Office: 206-905-9617 Cellular: 206-905-9617

1.3.1 Responsibilities of Key Personnel

1.3.1.1 Project Manager

The PM has authority to direct response operations; the PM assumes total control over site activities. In addition, the PM:

- Prepares and organizes background review of the project, the work plan, and the field team.
- Obtains permission for site access and coordinates activities with appropriate officials.
- Briefs the Site Supervisor (SS), Site Health and Safety Officer (SHSO), and field personnel on specific assignments.
- Together with the SS and SHSO, sees that health and safety requirements are met.
- Consults with the PHSM regarding unsafe conditions, incidents, or changes in site conditions or the scope of work.

1.3.1.2 Site Supervisor

The SS Reports to the PM, has authority to direct response operations, and assumes control over on-site activities. In addition the SS:

- Conducts daily safety meetings.
- Executes the work plan and schedule.
- Manages the construction operations.
- In conjunction with the SHSO, conducts periodic field health and safety inspections to ensure compliance with this HASP.
- Enforces safety procedures.
- Coordinates with the SHSO in enforcing worker protection levels.
- Enforces site control.
- Notifies, when necessary, local public emergency officials.
- In conjunction with the SHSO, responsible for following-up on incident reports to the PM.

1.3.1.3 Site Health and Safety Officer

The SHSO advises the PM and SS on all aspects of health and safety on site. The SHSO stops work if site operations threaten worker or public health and safety and informs the PHSM of any changes in site conditions or project status. In addition, the SHSO:

- Conducts periodic inspections to assess whether the HASP is being followed.
- Periodically inspects protective clothing and equipment.
- Sees that protective clothing and equipment are properly stored and maintained.
- Controls entry and exit at the access control points.
- Performs air monitoring in accordance with this HASP. Maintains and oversees operation of monitoring equipment and interpretation of data from the monitoring equipment.

- Monitors workers for signs of stress, including heat stress, cold exposure, and fatigue.
- Enforces the “buddy” system.
- Is informed of emergency procedures, evacuation routes, and telephone numbers of the local hospital, poison control center, fire department, and police department.
- Notifies, when necessary, local public emergency officials.
- Communicates incidents promptly to SS and PM.
- Maintains communication with PHSM on site activities.
- If applicable, ensures decontamination and disposal procedures are followed.
- Maintains the availability of required equipment.
- Advises appropriate health services and medical personnel of potential exposures.
- Notifies emergency response personnel in the event of an emergency. Coordinates emergency medical care.

1.3.1.4 Project Health and Safety Manager

The specific duties of the HSM include:

- Providing technical input into the design and implementation of the site HASP
- Advising on potential for worker exposure to project hazards along with appropriate methods and/or controls to eliminate site hazards.
- Ensures that a hazard assessment has been performed and the adequacy of the personal protective equipment (PPE) selected was evaluated as required by 29 CFR 1910.132(d), 1910.134, 1926.25, and 1926.55, and is duly noted by the signature(s) and date appearing on the cover page of this document

1.3.1.5 Work Team

The Work Team reports to the SS for on-site activities and is responsible for:

- Safely completes on-site tasks required to fulfill the work plan.
- Complies with the HASP.
- Attends and participates in daily safety meetings.
- Notifies the SS and SHSO of suspected unsafe conditions.
- Reports all incidents to the SS and SHSO.

1.4 Health and Safety Training Programs

This Section describes the health and safety training programs that site personnel must comply with.

1.4.1 Medical Surveillance and Respirator Fit Testing

This program tracks the physical condition of the company's employees in compliance with Occupational Safety and Health Administration (OSHA) standards (29 CFR 1910.120(e)), and the International Marine Contractors Association (IMCA) requirements for non-marine crew working in the offshore zone . Medical surveillance and Physicals will consist of the following:

- Current medical clearance to conduct hazardous waste field work and to wear a respirator.
- Yearly physicals by offshore trained physician – see Appendix B for medical certifications

1.4.2 Training

Training requirements and programs will comply with the OSHA Hazardous Waste Operations and Emergency Response regulation, 29 CFR 1910.120. Training requirements will consist of the following:

- Field personnel must complete a minimum of 40 hours of hazardous waste activity instruction.
- Field personnel must complete a minimum of three days of supervised field instruction.
- Field personnel assigned to the site will also receive 8 hours of refresher training each year.
- Vessel captains require USCG license and/or State training accreditation (Oregon FTL)
- On-site managers and supervisors directly responsible for employees engaged in hazardous waste operations will receive an additional 8 hours of supervisory training.
- Field personnel assigned to site will also receive first aid/CPR and blood borne pathogen training.
- Other training may be required depending on the task to be performed (e.g., confined space, excavation/trenching, underground storage tank removal, fall protection, respiratory protection, and hazard communication).

1.4.3 Initial Orientation

Hazardous Waste Operations Initial Health and Safety Orientation will consist of the following:

- All project participants engaged in site operations will attend an initial site orientation where this HASP will be discussed and followed. Personnel will acknowledge having been given the orientation by signing the agreement and acknowledgement form in Appendix A.

2.0 Hazard Analysis

Any change in the scope of work will require an amendment to this HASP. Any task conducted beyond the scope of work identified in this HASP must be evaluated using the Job Safety Analysis (JSA) process prior to conducting the work.

2.1 Job Safety Analysis

Common Gravity work tasks have been evaluated for their hazards and JSA documents developed which detail the chemical, physical and biological hazards associated with these tasks along with the control measures (engineering, administrative and/or personal protective equipment) that will be used to ensure that these tasks are conducted in a safe manner.

The PM and SS will be responsible for identifying work tasks and project site conditions that are beyond the previously developed JSA documents, and for communicating such information to the PHSM. The PHSM will work with the PM and SS to develop project specific JSAs or provide guidance in the development of JSAs to meet the identified project hazards.

If work tasks are identified during the course of the project which were not previously addressed in the JSA documentation supplied in Appendix C of this HASP then a task-specific JSA document shall be developed at the project site prior to conducting the work. The SS and SHSO shall develop this document(s) with input from the PM and PHSM as needed. Project personnel shall be trained on the contents of the developed task-specific JSA prior to its implementation. A copy of the task-specific JSA form used in this process is supplied in Appendix B of this HASP.

2.2 Hazard Communication Procedures

The purpose of hazard communication (Employee Right-to-Know) is to ensure that the hazards of all chemicals located at this field project site are communicated according to 29 CFR 1926.59 to all Gravity personnel and Gravity subcontractors. Personnel must follow the hazard communication procedures listed in Sections 2.3.1 and 2.3.2 when handling corrosive materials.

2.2.1 Corrosive Material Handling Procedures

Corrosive materials include acids and bases. They are extremely corrosive materials with a variety of uses. Acids include hydrochloric, nitric, and sulfuric acids. Bases include sodium hydroxide. Observe the following procedures when working with corrosive materials:

- Wear gloves and eye-splash protection while using acid dispensed from a small dropper bottle during water sampling.
- Wear a full-face, air-purifying respirator equipped with combination cartridges (organic vapor/acid gas) as well as Tyvek coveralls and nitrile gloves for large volume applications.
- Have an eyewash bottle and/or portable eyewash station on site.
- Do not add anything into a virgin chemical drum, including unused product.
- Avoid mixing strong acids and bases. Consult the PHSM for task-specific evaluation. If mixing is absolutely necessary, do it slowly. Avoid vapors or fumes that are generated.
- When diluting acids, add the acid to water in small quantities and mix cautiously.
- When diluting bases, add bases to water in small quantities and mix cautiously.

2.2.2 Hazard Communication Program

2.2.2.1 Container Labeling

Gravity personnel will ensure that all drums and containers are labeled according to contents. These drums and containers will include those from manufacturers and those produced on site by operations. All incoming and outgoing labels shall be checked for identity, hazard warning, and name and address of responsible party.

2.2.2.2 Employee Information and Training

An ongoing corporate training program will train employees on chemical hazards. In addition, chemical hazards will be communicated to employees through daily safety meetings and by an initial site orientation program. At a minimum, Gravity and related subcontractor employees will be instructed on the following:

- Chemicals and their hazards in the work area.
- How to prevent exposure to these hazardous chemicals.
- What the company has done to prevent workers' exposure to these chemicals.
- Procedures to follow if they are exposed to these chemicals.
- How to read and interpret labels and MSDS for hazardous substances found on Gravity sites.
- Emergency spill procedures.
- Proper storage and labeling.

3.0 Project Hazards and Controls

In addition to the Task-Specific JSAs described in the previous section, Section 3 of this HASP lists the health and safety procedures and practices applicable to this project. For additional information, consult with your health and safety professional.

3.1 Daily Safety Meetings

Daily safety meetings make accident prevention a top priority for everyone and makes them aware of important accident prevention techniques. Observe the following daily safety meetings procedures and practices:

- Daily safety meetings will be held each morning prior to site activities
- The tailgate meeting form in Appendix B will be used to document the meeting.

3.2 Physical Hazards and Controls

3.2.1 General Site Activities

- Observe the following general procedures and practices:
- Legible and understandable precautionary labels shall be affixed prominently to containers of potentially contaminated soil, water, and clothing.
- No food or beverages shall be present or consumed in a Contamination Reduction Zone (CRZ) or Exclusion Zone (EZ). These are only allowed in designated areas of the support zone.
- No tobacco products shall be present or used, and cosmetics shall not be applied in a CRZ or EZ. These are only allowed in designated areas of the support zone, if areas have been designated.
- Beards, facial hair, or other facial obstructions that interfere with respirator fit will preclude admission to the EZ when respirators are required.
- An emergency eyewash unit shall be located immediately adjacent to employees who handle hazardous or corrosive materials, including decontamination fluids. All operations involving the potential for eye injury, splash, etc., must have approved eyewash units locally available capable of delivering at least 0.4 gallons per minute for at least 15 minutes.
- All on-site activities will be conducted during daylight hours. If work after dusk becomes necessary due to an emergency, adequate lighting must be provided and notification of such activity made to the location contact.
- Hazardous work, such as handling hazardous materials and heavy loads, and equipment operation, etc., should not be conducted during severe storms.
- All temporary electrical power must have a ground fault circuit interrupter (GFCI) as part of its circuit if the circuit is not part of permanent wiring. All equipment must be suitable and approved for the class of hazard present.

3.2.2 Slip/Trip/Fall

Observe the following procedures and practices to prevent slips/trips/fall:

- Inspect each work area for slip/trip/fall potential prior to each work task.

- Slip/trip/fall hazards identified must be communicated to all personnel. Hazards identified shall be corrected or labeled with warning signs to be avoided.
- All personnel must be aware of their surroundings and maintain constant communication with each other at all times.

3.2.3 General Falls/Ladders

Observe the following general falls/ladders procedures and practices:

- Assess work areas for fall hazards. A fall protection system is required if work is conducted six feet or over.
- Use Type 1A rated ladders.
- Make sure ladder rungs are sturdy and free of cracks.
- Use ladders with secure safety feet.
- Pitch ladders at a 4:1 ratio.
- Secure ladders at the top or have another person at the bottom to help stabilize it.
- Ladders used to access an upper landing surface shall extend at least three feet above the upper landing surface.
- Do not use ladders for access to air stripper towers above six feet. Instead, use aerial lift.
- Use non-conductive ladders near electrical wires.
- The top step of a stepladder should not be used as a step.
- Do not carry any object or load that could cause a loss of balance or a fall.

3.2.4 Boating Operations

The following precautions shall be followed when conducting boating trailer and launch activities:

- Follow trailer/boat manufacturer's instructions for securing boat to trailer
- Follow trailer/boat manufacturer's instructions for securing boat trailer to towing vehicle
- Prohibit workers from moving into trailer/vehicle pinch points without advising vehicle operator
- Use experienced operators when backing trailers on boat ramps
- Wear proper work gloves when the possibility of pinching, or other injury may be caused by moving/ handling large or heavy objects
- Maintain all equipment in a safe condition
- Wear reflective warning vests when exposed to vehicular traffic
- Launch boats one at a time to avoid collisions
- Use a spotter for vehicles backing boats to launch area
- Understand and review hand signals
- Wear boots with non-slip soles when launching boats
- Wear USCG approved flotation devices when working on/near water
- Keep ropes and lines coiled and stowed to eliminate trip hazards

- Maintain 3 point contact on dock/pier ladders

The following precautions shall be followed when conducting boating operations:

- Wear USCG Approved personal flotation devices for work activities on or near water
- Provide a floating ring buoy with at least 90 feet of line in the immediate boat launch/land areas
- Step into the center of the boat
- Keep your weight low when moving in the boat
- Move slowly and deliberately
- Steer directly across other boat wakes at 90 degree angle to avoid capsizing
- Steer boat facing forward
- Watch for floating objects in the water
- Right-of-way is yielded to vessels on your boat's right (and vessels with limited ability to maneuver)

The following precautions shall be followed when working on a boat:

- Observe proper lifting techniques
- Obey sensible lifting limits (50 lb. maximum per person manual lifting)
- Use mechanical lifting equipment (pulleys, winches) to move large, awkward loads
- Wear USCG Approved personal flotation devices for work activities on or near water

The following safety related items shall be available when conducting boating operations:

Table 3-2
Safety Equipment Specific to In-Water Work

Additional Safety Equipment for Sampling Vessel per US Coast Guard Requirements:	
• Proper vessel registration, numbering, and documentation (registered with state, certificate of vessel registration number displayed, and carry valid certificate of number • USCG approved Personal Flotation Devices (PFDs/life jackets) for every person on sampling vessel Appropriate, non-expired, visual distress devices for day and night use from the following: – Three hand-held red flares (day and night) or: – One hand-held red flare and two parachute flares (day and night) or; – One hand-held orange smoke signal, two floating orange smoke signals (day) and one electric distress light (night only) • Properly maintained and inspected USCG approved fire extinguishers (no fixed system = (2) B-1 or (1) B-2 type extinguishers, fixed system = (1) B-1 type extinguisher) • Proper ventilation of gasoline powered vessels • Sound producing device (whistle, bell, or horn) • VHF 2-way radio • Not exceed vessel safe loading capacity • Proper navigational light display • Throwable life ring with attached line (any vessel larger than 16 ft is required to carry one Type IV (throwable) PFD	
Additional USCG Recommended Equipment Includes:	
• Extra visual distress signals • Spare Gravity • Heaving line • Fenders • First aid kit • Flashlight • Mirror • Searchlight • Sunburn lotion • Tool kit • Spare fuel • Chart and compass	• Boat hook • Spare propeller • Mooring line • Food and water • Binoculars • Spare batteries • Sunglasses • Marine hardware • Extra clothing • Spare parts • Alternate propulsion (oars/paddles) • Dewatering device (pump or bailer)

3.2.5 Working Over or Near Water

Personal Flotation Devices:

Personal flotation devices are not required where employees are continuously protected from the hazard of drowning by railings, nets, safety belts or other applicable provisions.

Type III or better U.S. Coast Guard approved International Orange personal floatation device (PFD) shall be provided and properly worn by all personnel in the following circumstances:

1. On floating pipelines, pontoons, rafts, or stages;
2. On structures extending over or next to water except where guardrails or safety nets are provided for employees;
3. Working alone at night where there are drowning hazards, regardless of other safeguards provided;
4. In skiffs, small boats, or launches, unless in an enclosed cabin or cockpit; or
5. Whenever there is a drowning hazard.

The following precautions shall be followed when using personal floatation devices:

- Prior to and after each use, the buoyant work vests or life preservers shall be inspected for defects which would alter their strength or buoyancy. Defective devices or devices with less than 13 lbs. Buoyancy shall be removed from service.
- All PFDs shall be equipped with reflective tape as specified in 46 CFR 25.25-15.
- 30-inch U.S. Coast Guard approved ring buoys with at least 150 feet of 600 pound capacity line shall be provided and readily available for emergency rescue operations. Distance between ring buoys shall not exceed 200 feet.
- PFD lights conforming to 46 CFR 161.012 shall be required whenever there is potential need for life rings to be used after dark. On shore installations, at least one life ring, and every third one thereafter, shall have a PFD light attached. PFD lights on life rings are required only in locations where adequate general lighting (e.g., floodlights, light stanchions) is not provided.

Lifesaving and Safety Boats:

Regulations require that a lifesaving boat is available and ready for use under working conditions where there is a potential for employees to fall into swift running water, such as a river or a strait with strong currents. The following precautions shall be followed concerning the use of lifesaving powerboats:

- At least one lifesaving powerboat shall be immediately available at locations where employees work over or immediately next to water.
- Personnel trained in launching and operating the powerboat shall be readily available during working hours. Lifesaving personnel shall perform a lifesaving drill before the initiation of work at the project site and periodically thereafter (at least monthly or whenever new personnel are involved).
- Powerboats shall be kept afloat or ready for instant launching.
- Lifesaving powerboats shall be equipped, at a minimum, as follows:
  - Two oars (oars not required on boats powered by an inboard motor);
  - Oarlocks attached to the gunwales or the oars;
  - One ball-pointed boat hook;
  - One ring buoy with 50 feet of 600 pound capacity line attached; and
  - PFD's in number equaling the powerboat rating for the maximum number of personnel allowed on board.

- Powerboats shall have flotation tanks or buoyant material capable of floating the boat and its equipment and the crew.
- On vessels without permanently mounted navigational lights, portable battery-operated navigation lights will be available and used for night operations.

3.2.6 Hand and Power Tools

Observe the following procedures and practices when working with hand and power tools:

- Keep hand tools sharp, clean, oiled, dressed, and not abused.
- Worn tools are dangerous: e.g., the “teeth” in a pipe wrench can slip if worn smooth; an adjustable wrench will slip if the jaws are sprung; hammerheads can fly off loose handles.
- Tools subject to impact (chisels, star drills, and caulking irons) tend to “mush-room.” Keep them dressed to avoid flying spalls. Use tool holders.
- Don't force tools beyond their capacity. No “homemade” handles or extensions (cheaters) are permitted! Don't use tools for pry bars.
- Flying objects can result from operating almost any power tool, so always warn people in the vicinity and use proper eye protection.
- Each power tool should be examined before use for damaged parts, loose fittings, and frayed or cut electric cords. Tag and return defective tools for repairs. Inspect also for adequate lighting, proper lubrication, and abandoned tools or material that could “vibrate into trouble.”
- Air must be shut off or the electric cord unplugged before making tool adjustments. Air must be “bled down” before replacement or disconnection.
- Proper guards or shields must be installed on all power tools before issue. Do not use improper tools or tools without guards in place.
- Replace all guards before start-up. Remove cranks, key, or wrenches used in ser-vice work.

3.2.7 Vehicular Traffic

Observe the following procedures and practices regarding vehicular traffic:

- Wear traffic safety vest when vehicle hazard exists.
- Use cones, flags, barricades, and caution tape to define work area.
- Use vehicle to block work area.
- Engage police detail for high-traffic situations.
- Always use a spotter in tight or congested areas for material deliveries.

3.2.8 Noise

Observe the following procedures and practices regarding noise:

- Wear hearing protection when equipment such as a drill rig, jackhammer, cut saw, air compressor, blower or other heavy equipment is operating on the site.
- Wear hearing protection whenever it is necessary to speak above normal conversational speech due to loud noise—this much noise indicates the need for protection.

- Conduct noise monitoring of suspected high noise operations at the beginning of the workday or start up of new operations to verify noise control/hearing protection requirements.

3.2.9 Lifting and Material Handling

Observe the lifting and material handling procedures and practices:

- Use leather gloves when handling metal, wire rope, sharp debris, or transporting materials (wood, piping, drums, etc.).
- The size, shape, and weight of the object to be lifted must first be considered. No individual employee is permitted to lift any object that weights over 50 pounds. Multiple employees or mechanical lifting devices are required for objects over the 50-pound limit.
- Plan a lift before doing it. Bend at the knees and lift with the legs; keep the natural curves of the back; do not use back muscles.
- Check route for clearance.
- Use the buddy system when lifting heavy or awkward objects.
- Do not twist body while lifting.
- Know the capacity of any handling device (crane, forklift, chain fall, come-along) that you intend to use.
- Use tag lines to control loads.
- Ensure that your body, material, tools, and equipment are safe from such unexpected movement as falling, slipping, rolling, tripping, bowing, or any other un-controlled motion.
- Trucks (i.e., flat beds) hauling equipment or materials must not be moved once rigging has been released.
- Chock all material and equipment (such as pipe, drums, tanks, reels, trailers, and wagons) as necessary to prevent rolling.
- Tie down all light, large-surface-area material that might be moved by the wind.
- When working at heights, secure tools, equipment, and wrenches against falling.
- Do not store materials or tools on ducts, lighting fixtures, beam flanges, hung ceilings, or similar elevated locations.
- Fuel-powered tools used inside buildings or enclosures shall be vented and checked for excessive noise

3.2.10 Fire Control

Observe the following fire control procedures and practices:

- Smoke only in designated areas.
- Keep flammable liquids in closed containers.
- Keep site clean; avoid accumulating combustible debris such as paper.
- Follow Hot Work Safety Procedures when welding or performing other activities requiring an open flame.
- Isolate flammable and combustible materials from ignition sources.

- Ensure fire safety integrity of equipment installations according to NEC specifications.

3.2.11 Static Electricity/Transfer of Flammable Liquids

Observe the following procedures and practices regarding static electricity when transferring flammable liquids:

- Do not create static discharge in flammable atmosphere.
- Electrically bond and ground pumps, transfer vessels, tanks, drums, bailers, and probes when moving flammable liquids.
- Electrically bond and ground vacuum trucks and the tanks they are emptying.
- Do not splash fill containers with flammable liquids.
- Pour flammable liquids slowly and carefully.
- Two Fire extinguishers (2A20: BC) must be available, charged, inspected, and readily accessible.

3.2.12 Cleaning Equipment

Observe the following procedures and practices when cleaning equipment:

- Wear appropriate PPE to avoid skin and eye contact with isopropyl alcohol, Alconox, or other cleaning materials.
- Stand upwind to minimize any potential inhalation exposure.
- Dispose of spent cleaning solutions and rinses accordingly.

3.3 Environmental Hazards and Controls

3.3.1 Mosquitoes

Mosquitoes in the New Caledonia have been known to carry West Nile Virus, St. Louis encephalitis, and Dengue Fever. To avoid mosquito bites:

- Apply insect repellent containing DEET (N,N-diethyl-meta-toluamide) when you're outdoors.
- Read and follow the product directions whenever you use insect repellent.
- Wearing long-sleeved clothes and long pants treated with repellent to further reduce your risk, as will staying indoors during peak mosquito feeding hours (dusk until dawn).
- Limit the number of places available for mosquitoes to lay their eggs by eliminating standing water sources from around the work area.
- Check to see if there is an organized mosquito control program near the project site. If no program exists, work with your local government officials to establish a program.

3.3.2 Poisonous Snakes

Observe the following procedures and practices regarding poisonous snakes:

- Avoid walking in areas where snakes may nest or hide. When walking, always look ahead for signs of snakes.

- Use extreme caution when moving or lifting objects that could be used by snakes as cover.
- Never reach under or behind objects or into other areas where snakes may hide.
- Poisonous snakebites are medical emergencies—seek immediate medical treatment.
- Wear sturdy leather boots.

3.3.3 Bird Droppings

Large populations of roosting birds may present a disease risk. The most serious health risks arise from disease organisms that grow in the accumulations of bird droppings, feathers, and debris under a roost – especially if roosts have been active for years. Among the fungal diseases associated with bird droppings, the two most common are Histoplasmosis and Cryptococcosis.

If you are working in an area where large quantities of droppings are present, follow certain precautions to minimize the risk from disease organisms in the droppings:

- Wear a respirator that can filter particles as small as 0.3 microns, such as a HEPA filter.
- Wear disposable protective gloves, hat, coveralls, and boots if you will be in close contact.
- Wash or shower at the work site after cleanup, if possible.
- Modify the structure or use methods to prevent birds from reestablishing the roost.

3.3.4 Feral Dogs

Feral dogs have shown up on several Gravity jobsites. Packs of feral dogs can be dangerous, so if you observe them on the site, call animal control immediately. If a dog approaches you, take the following steps to reduce your chances of being attacked:

- Don’t run away or run past the dog.
- Remain calm. Don’t scream. If you say anything, speak calmly and firmly. Avoid eye contact. Try to stay still until the dog leaves, or back away slowly until the dog is out of sight. Don’t turn and run.
- If you fall to the ground or are knocked down, curl into a ball, placing your hands over your head and neck. Protect your face.

If a dog bites someone, take the following steps:

- Restrain the dog immediately, if it is safe to do so. The dog will have to be quarantined or tested for rabies.
- Check on the victim’s condition. Call 911 if paramedic response is required.
- Call the EHS Department to arrange for medical treatment.

3.3.5 Rodent-Borne Diseases

Rodent infestation in the workplace has the potential to cause serious communicable diseases including hantavirus pulmonary syndrome and bubonic plague. The most common rodent-borne disease is hantavirus, which may infect workers who inhale tiny droplets containing the virus when fresh rodent urine, droppings or nesting materials are stirred up.

Working conditions that my put workers at risk of hantavirus include:

- Contact with rodent feces or dried urine which may mobilize particles of these wastes into the air where they may be inhaled
- Entry into rooms or warehouses that have been closed up and infested for extended periods
- Activities that stir up dust which may mobilize hantavirus

If working in areas of obvious rodent infestation, take the following precautions:

- Do not enter rooms or warehouses that have been closed up unless absolutely necessary.
- If work in closed up areas or areas with rodent infestation is necessary, contact professional exterminators to eliminate the infestation and clean up the location
- If an exterminator is not available/possible, employees should clean up the infested area using the following steps
  - When going into outbuildings or rooms that have been closed for an extended period, open them up and air out before cleaning
  - Don an air purifying respirator equipped with HEPA P-100 cartridges and nitrile gloves before cleaning
  - Don't stir up dust by sweeping up or vacuuming up droppings, urine or nesting materials
  - Thoroughly wet contaminated areas with detergent or liquid to deactivate the virus. Most general-purpose disinfectants and household detergents are effective. However, a hypochlorite solution prepared by mixing 1 and 1/2 cups of household bleach in 1 gallon of water may be used in place of commercial disinfectant.
  - Once everything is wet, take up contaminated materials with a damp towel, then mop or sponge the area with disinfectant.
  - Spray dead rodents with disinfectant and flea repellent (to avoid bubonic plague), then double-bag and dispose in appropriate waste disposal system. Contact the local or state health department for other disposal methods.
  - Finally, remove respirator and disinfect gloves before taking them off with disinfectant or soap and water. After taking off the clean gloves, thoroughly wash hands with soap and warm water.

If you experience hantavirus symptoms (fatigue, fever, and muscle aches) within 1 to 5 weeks of exposure to potentially affected rodents and their droppings, contact your supervisor immediately.

3.3.6 Heat Stress

Observe the following general procedures and practices regarding heat stress:

- Increase number of rest breaks and/or rotate workers in shorter work shifts.
- Watch for signs and symptoms of heat exhaustion and fatigue.
- During hot months, plan work for early morning or evening.
- Use ice vests when necessary.
- Rest in cool, dry areas.

3.3.6.1 Signs, Symptoms, and Treatment

Adverse climatic conditions are important considerations in planning and conducting site operations. High ambient temperature can result in health effects ranging from transient heat fatigue, physical discomfort, reduced efficiency, personal illness, increased accident probability, etc., to serious illness or death. Heat stress is of particular concern when chemical protective garments are worn since they prevent evaporative body cooling. Wearing personal protective equipment places employees at considerable risk of developing heat stress.

Heat stress is caused by a number of interacting factors, including environmental conditions, clothing, workload, and the individual characteristics of the worker. Because heat stress is probably one of the most common (and potentially serious) illnesses, regular monitoring and other preventive precautions are vital.

Heat Rash. Heat rash can be caused by continuous exposure to hot and humid air and skin abrasion from sweat soaked clothing. The condition is characterized by a localized red skin rash and reduced sweating. Aside from being a nuisance, the ability to tolerate heat is reduced. To treat, Keep skin hygienically clean and allow it to dry thoroughly after using chemical protective clothing.

Heat Cramps. Heat cramps are caused by profuse perspiration with inadequate electrolytic fluid replacement. This often robs the larger muscle groups (stomach and quadriceps) of blood which can cause painful muscle spasms and pain in the extremities and abdomen. To treat, remove employee to a cool place and give sips of water or an electrolytic drink. Watch for signs of heat exhaustion or stroke.

Heat Exhaustion. Heat exhaustion is a mild form of shock caused by increased stress on various organs to meet increased demand to cool the body. Onset is gradual and symptoms should subside within one hour. It symptoms include weak pulse; shallow breathing; pale, cool, moist skin; profuse sweating; dizziness; fatigue. To treat, remove employee to a cool place and remove as much clothing as possible. Give sips of water or electrolytic solution and fan the person continuously to remove heat by convection. Do not allow the affected per-son to become chilled—treat for shock if necessary.

Heat Stroke. Heat stroke is the most severe form of heat stress; the body must be cooled immediately to prevent severe injury and/or death. *This is a medical emergency!* Symptoms include red, hot, dry skin; body temperature of 105◦ Fahrenheit or higher; no perspiration; nausea; dizziness and confusion; strong, rapid pulse. Since heat stroke is a true medical emergency, transport the victim to a medical facility immediately. Prior to transport, remove as much clothing as possible and wrap the victim in a sheet soaked with water. Fan vigorously while transporting to help reduce body temperature. Apply cold packs, if available; place under the arms, around the neck, or any other place where they can cool large surface blood vessels. If transportation to a medical facility is delayed, reduce body temperature by immersing victim in a cool water bath (however, be careful not to over-chill the victim once body temperature is reduced below 102o F). If this is not possible, keep victim wrapped in a sheet and continuously douse with water and fan.

3.3.6.2 Prevention

The implementation of preventative measures is the most effective way to limit the effects of heat-related illnesses. During periods of high heat, adequate liquids must be provided to re-place lost body fluids. Replacement fluids can be a 0.1 percent salt-water solution, a commercial mix such as Gatorade, or a combination of these with fresh water. The replacement fluid temperature should be kept cool, 50o F to 60o F, and should be placed close to the work area. Employees must be encouraged to drink more than the amount required to satisfy thirst. Employees should also be encouraged to salt their foods more heavily during hot times of the year.

Cooling devices such as vortex tubes or cooling vests can be worn beneath impermeable clothing. If cooling devices are worn, only physiological monitoring will be used to deter-mine work activity.

All workers are to rest when any symptoms of heat stress are noticed. Rest breaks are to be taken in a cool, shaded rest area. Employees shall remove chemical protective garments during rest periods and will not be assigned other tasks.

All employees shall be informed of the importance of adequate rest and proper diet including the harmful effects of excessive alcohol and caffeine consumption.

3.3.6.3 Monitoring

Heat stress monitoring will be required when employees are working in environments exceeding 90ºF ambient air temperature. If employees are wearing impermeable clothing, this monitoring will begin at 78ºF. There are two general types of monitoring that the health and safety representative can designate to be used: wet bulb globe temperature (WBGT) and physiological. The Heat Stress Monitoring Record form (see Appendix B) will be used to record the results of heat stress monitoring.

Wet Bulb Globe Temperature (WBGT). The WBGT index is the simplest and most suitable technique to measure the environmental factors which most nearly correlate with core body temperature and other physiological responses to heat. When WBGT exceeds 25.9oC (78oF), the work regiment in Table 1 and Figure 1 of the section Heat Stress in the latest edition of the "American Conference of Governmental Industrial Hygiene (ACGIH) Threshold Limit Value (TLV) Booklet" should be followed.

Physiological. Physiological monitoring can be used in lieu of, or in addition to, WBGT. This monitoring can be self-performed once the health and safety representative demonstrates appropriate techniques to affected employees. Since individuals vary in their susceptibility to heat, this type of monitoring has its advantages. The two parameters that are to be monitored at the beginning of each rest period are:

- **Heart Rate** – The maximum heart rate (MHR) is the amount of work (beats) per minute a healthy person's heart can be expected to safely deliver. Each individual will count his/her radial (wrist) pulse as early as possible during each rest period. If the heart rate of any individual exceeds 75 percent of their calculated maximum heart rate (MHR = 200 - age) at the beginning of the rest period, then the work cycle will be decreased by one-third. The rest period will remain the same. An individual is not permitted to return to work until his/her sustained heart rate is be-low 75 percent of their calculated maximum heart rate.
- **Temperature** – Each individual will measure his/her temperature with a thermometer for one minute as early as possible in the first rest period. If the temperature exceeds 99.6ºF at the beginning of the rest period, then the work cycle will be decreased by one-third. The rest period will remain the same. An individual is not permitted to return to work if his/her temperature exceeds 100.4ºF

3.3.6.4 Training

Employees potentially exposed to heat stress conditions will be instructed on the contents of this procedure. This training can be conducted during daily tailgate safety meetings.

3.3.7 Cold Stress

Observe the following procedures and practices regarding cold stress:

- Take breaks in heated shelters when working in extremely cold temperatures.
- Upon entering the shelter, remove the outer layer of clothing and loosen other layers to promote evaporation of perspiration.

- Drink warm liquids to reduce the susceptibility to cold stress.
- Be aware of cold stress symptoms, including shivering, numbness in the extremities, and sluggishness.
- Provide adequate insulating dry clothing to maintain warmth if work is performed in air temperature below 40° F. Wind chill cooling rates and the cooling power of air are critical factors. The higher the wind speed and the lower the temperature in the work area, the greater the insulation value of the protective clothing required.
- If the air temperature is of 32° F or less, hands should be protected.
- If only light work is involved and if the clothing on the worker may become wet on the job site, the outer layer of the clothing in use should be impermeable to water. With more severe work under such conditions, the outer layer should be water repellent, and the outer wear should be changed as it becomes wetted. The outer garments should include provisions for easy ventilation in order to prevent wetting of inner layer by sweat.
- If available clothing does not give adequate protection to prevent cold injury, work should be modified or suspended until adequate clothing is made available, or until weather conditions improve.
- Implementing a buddy system in which workers are responsible for observing fellow workers for early signs and symptoms of cold stress.

3.3.7.1 Signs, Symptoms, and Treatment

Cold stress can range from frostbite to hypothermia. Below are listed the signs and symptoms of cold stress. Personnel should follow the appropriate guidelines if any personnel exhibit these symptoms:

Frostbite - Pain in the extremities and loss of manual dexterity. "Frostnip" or reddening of the tissue, accompanied by a tingling or loss of sensation in the extremities. Continuous shivering.

Hypothermia -Pain in the extremities and loss of manual dexterity. Severe, uncontrollable shivering. Inability to maintain level of activity. Excessive fatigue, drowsiness, irritability, or euphoria. Severe hypothermia: clouded consciousness, low blood pressure, pupil dilation, cease of shivering, unconsciousness, and possible death.

Remove the patient to a warm, dry place. If clothing is wet, remove and replace with dry clothing. Keep patient warm. Re-warming of patient should be gradual to avoid stroke symptoms. Dehydration of the loss of body fluids may result in cold injury due to a significant change in blood flow to the extremities. If patient is conscious and alert, warm sweet liquids should be provided. Coffee and other caffeinated liquids should be avoided because of diuretic and circulatory effects. Extremities affected by frostbite should be gradually warmed up and returned to normal temperature. Moist compresses should be applied; begin with lukewarm compresses and slowly increase the temperature as changes in skin temperature are detected. Keep patient warm and calm, remove to a medical facility as soon as possible.

3.3.8 Inclement Weather

Observe the following procedures and practices regarding inclement weather:

- Stop outdoor work during electrical storms, hailstorms, and other extreme weather conditions such as extreme heat or cold.
- Take cover indoors or in vehicle.

- Listen to local forecasts for warning about specific weather hazards such as tornadoes, hurricanes, and flash floods.

4.0 Personal Protective Equipment

The minimum level of PPE should be selected according to the hazards that may be encountered during site activities in accordance with established U.S. EPA levels of protection (D and C). Only PPE that meets the following American National Standards Institute (ANSI) standards are to be worn:

- Eye protection - ANSI Z87.1-1989.
- Head protection - ANSI Z89.1-1986.
- Foot protection - ANSI Z41-1991.
- Traffic vest in high traffic areas and around heavy equipment.

4.1.1 Level D

Level D protection will be used when:

- The atmosphere contains no known hazard
- Work functions preclude splashes, immersions, or the potential for unexpected inhalation of, or contact with, hazardous concentrations of chemicals
- Atmospheric concentrations of contaminants are less than the Threshold Limit Value (TLV)

4.2 Activity Specific Levels of Protection

See Tables 4-2 and 4-3 for general PPE requirements for Levels D and C protection for project work sites.

Level D is the minimum acceptable level for sites where petroleum hydrocarbons are the COC. Upgrade to Modified Level D occurs when there is a possibility that contaminated media can contact the skin or work uniform. Upgrade to Level C occurs when the results of air monitoring reveals that action levels have been exceeded. Wear hearing protection when there are high noise levels. Workers must maintain proficiency in the use and care of PPE that is to be worn.

Table 4-4
Activity Specific PPE/Air Monitoring Summary

Job Task	PPE Level	Instrument	Monitoring Frequency / Special Requirements
Loading and unloading sample coolers, boat equipment, general non-sampling activities on boat	Level D	N/A	Hard hat for overhead hazards. PFD when working on or near water.
Operation of sampling vessel and equipment from inside boat house (MSS operator)	Modified Level D	N/A	Should not leave pilot house if overhead hazards, decontamination chemicals, or sediment exposure is possible. PFD when working on or near water.
Decontamination of sampling equipment	Level D with potential upgrade to Level C	PID	Potential upgrade to Level C when handling samples – presence of product odors. Air monitoring at start up of work at each

			task location, then every 30 – 60 minutes based upon air monitoring results. Monitor 15 minutes to continuously if action levels have been reached. Face shield with hard hat for splash hazard and overhead hazard. PFD when working on or near water.
General site duties, system O&M, operation of equipment, etc.	Level D	N/A	Hard hat for overhead hazards. PFD when working on or near water.

Note 1: "Start up of work at each new task location" means to monitor the air quality at each new operation on the site. The breathing zone is the area inside a 1-foot radius around the head.

Note 2: A downgrade in the air monitoring program must be approved by the SHSO and HSM.

5.0 Decontamination

5.1 Decontamination Procedures

Operations conducted at this site have the potential to contaminate field equipment and PPE. See the following sections for the decontamination procedures that must be followed to prevent the transfer of contamination to vehicles, administrative offices, and personnel.

5.1.1 Field Equipment

Field equipment can include bailers, interface probes, hand tools, drill augers, and miscellaneous sampling equipment. Observe the following practices and procedures when decontaminating field equipment:

- Decontaminate with a solution of detergent and water; rinse with water prior to leaving the site.
- Protect from exposure by covering with disposable covers such as plastic to minimize required decontamination activities.

5.1.2 Disposable PPE

Disposable PPE can include Tyvek suits, inner latex gloves, respirator cartridges. Observe the following practices and procedures when decontaminating disposable PPE:

- Dispose of according to the requirements of the client and state and federal agencies.
- Change out respirator cartridges daily and dispose accordingly.

5.1.3 Non-disposable PPE

Non-disposable PPE can include respirators and boots and gloves. When decontaminating respirators, observe the following practices and procedures:

- Wipe out respirator with disinfecting pad prior to donning.
- Decontaminate on site at the close of each day with a solution of an approved sanitizing solution.

When decontaminating boots and gloves, observe the following practices and procedures:

- Decontaminate outside with a solution of detergent and water; rinse with water prior to leaving the site.
- Protect from exposure by covering with disposable covers such as plastic to minimize required decontamination activities.

5.1.4 Emergency Decontamination

Personnel with medical problems or injuries may also require decontamination. There is the possibility that the decontamination may aggravate or cause more serious health effects. If prompt lifesaving, first aid, and medical treatment are required, decontamination procedures will be omitted. In either case, a member of the site management team will accompany contaminated personnel to the medical facility to advise on matters involving decontamination.

5.1.5 Sanitizing of Personal Protective Equipment

Respirators, reusable protective clothing, and other personal articles not only must be decontaminated before being reused, but also sanitized. The insides of masks and clothing become soiled due to

exhalation, body oils, and perspiration. Manufacturer's instructions should be used to sanitize the respirator masks. If practical, reusable protective clothing should be machine-washed after a thorough decontamination; otherwise, it must be cleaned by hand.

6.0 Site Control/Communications

6.1 Site Control

To prevent contamination from migrating from personnel and equipment, work areas will be clearly specified as an Exclusion Zone (EZ), Contaminant Reduction Zone (CRZ), or Support Zone (SZ) prior to beginning operations. Each work area will be clearly identified using signs or physical barriers.

The primary purpose for site controls is to establish the hazardous area perimeter, to reduce migration of contaminants into clean areas, and to prevent access or exposure to hazardous materials by personnel. At the end of each workday, the site should be secured and/or guarded to prevent unauthorized entry. Site work zones will include:

- **Clean Zone/Support Zone (SZ)**. This uncontaminated zone will be the area outside the exclusion and decontamination (decon) zone and within the geographic perimeters of the site (boat and processing area). This area is used for staging of materials, parking of vehicles, office and laboratory facilities, sanitation facilities, and receipt of deliveries. Personnel entering this zone may include delivery personnel, visitors, security guards, etc., who will not necessarily be permitted in the exclusion zone.
- **Contaminant Reduction Zone (CRZ).** The contaminant reduction zone will provide a location for removal of contaminated PPE and final decontamination of PPE. A separate decontamination area will be established for heavy equipment. All personnel and equipment must exit via the decon area.
- **Exclusion Zone/Hot Zone (EZ)**. The exclusion zone will be the “hot zone” or contaminated area inside the site perimeter (sample collection area of boat). Entry to and exit from this zone will be made through a designated point. Appropriate warning signs to identify the exclusion zone should be posted (i.e., DANGER, AUTHORIZED PERSONNEL ONLY, PROTECTIVE EQUIPMENT BEYOND THIS POINT, etc.). Personnel and equipment decontamination must accompany exit from the exclusion zone.

For sediment investigations, the exclusion zone is defined as the area where individuals may come in direct contact with potentially contaminated sediment (i.e. sampling equipment, decontamination area and chemicals, bow of sampling vessel). For core extrusion activities, the exclusion zone will be defined as the area where extrusion activities occur.

A log of all personnel visiting, entering, or working on the site shall be maintained by the SS or SHSO. No visitor will be allowed in the EZ without showing proof of training and medical certification, per 29 CFR 1910.120(e), (f). Visitors will attend a site orientation given by the SS/SHSO and sign the HASP.

6.1.1 General Site Control Safety Procedures

The following are standard safe work practices that apply to all site personnel; they will be discussed in the safety briefing prior to initiating work on the site:

- Eating, drinking, chewing gum or tobacco, and smoking is prohibited in the EZ/CRZs.
- Hands and face must be washed upon leaving the EZ and before eating, drinking, chewing gum or tobacco, and smoking.
- A buddy system will be used. Hand signals will be established to maintain communication.

- During site operations, each worker will consider himself as a safety backup to his partner. Off-site personnel will provide emergency assistance.
- Visual contact will be maintained between buddies on-site when performing hazardous duties.
- No personnel will be admitted to the site without the proper safety equipment, training, and medical surveillance certification.
- All personnel must comply with established safety procedures. Any staff member who does not comply with safety policy, as established by the SS/SSO, will be immediately dismissed from the site.
- Proper decontamination procedures must be followed before leaving the EZ.

6.1.2 Site Security and Work Zone Definition

This Section contains general guidelines for developing site security measures for working in a street or roadway and excavations.

6.1.2.1 Working In Street or Roadway

Observe the following site control practices and procedures when working in streets or road-ways:

- Wear traffic vest and hardhat when vehicle hazard exists.
- Use cones, flag-mounted cones, caution tape, and/or barricades.
- Use vehicle strobe light and block area with truck.
- Develop traffic flow plan for high traffic situations (as appropriate):
  - use flag person
  - use flashing arrow sign
  - use “MEN WORKING” signs liberally
  - obtain lane closing permits
  - engage police details

6.2 Field Communications

Communications between all Shaw employees and subcontractors at the work site can be verbal and/or non-verbal. Verbal communication can be affected by the on-site background noise and various PPE. See Table 6-1 for a list of the type of communication methods and equipment to use, depending on site conditions. Communication equipment must be checked daily to ensure proper operation. All project personnel must be initially briefed on the communication methods prior to starting work; communication methods should be reviewed in Daily Tailgate Safety Meetings.

Table 6-1
Field Communication Methods

Communication Device	Type of Communications	Signal
Telephone On-Site Or Cellular Telephone	Emergency notification	Initiate phone call using applicable emergency numbers
Two-way Radio	Emergency notification among site personnel	Initiate radio communication with Code Red message
Compressed Air Horn	Hailing site personnel for non-emergency	One long blast, one short blast
Compressed Air Horn	Hailing site personnel for emergency evacuation	Three long continuous blasts
Visual	Hailing site personnel for distress, need help	Arms waved in circle overhead
Visual	Hailing site personnel for emergency evacuation	Arms waved in criss-cross over head
Visual	Contaminated air/strong odor	Hands clutching throat
Visual	Break, lunch, end of day	Two hands together, break apart

7.0 Emergency Response and Contingency Plan

In the event of an emergency, immediate action must be taken by the first person to recognize the event.

7.1 Spills and Releases of Hazardous Materials

When required, notify the National Response Center. The following information should be provided to the National Response Center:

- Name and telephone number.
- Name and address of facility.
- Time and type of incident.
- Name and quantity of materials involved, if known.
- Extent of injuries.
- Possible hazards to human health or the environment outside of the facility.

The emergency telephone number for the National Response Center is 800-424-8802. If hazardous waste has been released or produced through control of the incident, ensure that:

- Waste is collected and contained.
- Containers of waste are removed or isolated from the immediate site of the emergency.
- Treatment or storage of the recovered waste, contaminated soil or surface water, or any other material that results from the incident or its control is provided.
- Ensure that no waste that is incompatible with released material is treated or stored in the facility until cleanup procedures are completed.
- Ensure that all emergency equipment used is decontaminated, recharged, and fit for its intended use before operations are resumed.

7.2 Emergency First Aid Procedures

- Maintain a first aid kit and eye wash station on site.
- Survey the situation. Do not endanger your own life. Do not enter a confined space to rescue someone who has been overcome unless properly equipped and trained. Ensure all protocols are followed including that a standby person is pre-sent. If applicable, review MSDS to evaluate response actions for chemical exposures.
- Call 911 (if available) or the fire department immediately. Explain the physical injury, chemical exposure, fire, or release.
- Decontaminate the victim without delaying life-saving procedures.
- If the victim's condition appears to be non-critical, but seems to be more severe than minor cuts, he/she should be transported to the nearest hospital by trained Emergency Medical Services (EMS) personnel: let the doctor assume the responsibility for determining the severity of the injury. If the condition is obviously serious, EMS must transport the victim.
- Notify the PM, SS and the SHSO. Complete the appropriate incident investigation reports.

7.2.1 Stop Bleeding and CPR Guidelines

To Stop Bleeding

Perform the following steps to stop bleeding. Responder must have a current certificate to administer first aid.

1. Give medical statement.
2. Assure airway, breathing, and circulation.
3. Use direct pressure over the wound with clean dressing or your hand (use non-permeable gloves). Direct pressure will control most bleeding.
4. Bleeding from an artery or several injury sites may require direct pressure on a pressure point. Use pressure points for 30 to 60 seconds to help control severe bleeding.
5. Continue primary care and seek medical aid as needed.

CPR

Perform the following steps to administer CPR. Responder must have a current certificate to administer CPR.

1. Make sure the scene is safe before administering aid to the victim.
2. Arousal: Check for consciousness. If not conscious continue with these CPR instructions.
3. Open airway with chin-lift.
4. Look, listen, and feel for breathing.
5. If breathing is absent, give 2 breaths (1 second each) with visible chest rise. NOTE: Use a CPR mask or other approved barrier device if possible.
6. Bare victim's chest and locate CPR finger position.
7. Deliver first cycle of 30 chest compressions at a rate of not less than one per second.
8. Repeat Steps 5, 6 and 7 until an AED has arrived and is ready to deliver a shock, or you have been relieved by another CPR-trained person or professional emergency response personnel.

7.2.2 Injury Management/Incident Notification

Observe the following injury management/incident notification procedures and practices:

Injury Management

Observe the following injury management procedures and practices:

- Once a personal injury incident is discovered the first action will be to ensure the injured party received appropriate medical attention.
- If it is safe to do so, the nearest workers will immediately assist a person who shows signs of medical distress or who is involved in an accident.
- The work crew supervisor will be summoned. The work crew supervisor will immediately make contact with the PM or other designated individual to alert them of the medical emergency. The work crew supervisor will advise and perform the following "Care of the Employee":
  - Location of the victim at the work site.

- Nature of the emergency.
- Whether the victim is conscious.
- Specific conditions contributing to the injury, if known.
- Escort the injured person to the occupational clinic or hospital or arrange for ambulance.

Notification Requirements

Directly After "Care of the Employee," make the following notifications, in order:

- Contact the PM and H&S Manager immediately
- PM will contact upper line management
- The H&S Manager will facilitate the incident investigation

All client requirements will also be adhered to pertinent to personal injury incident reporting.

Incident Other Than Personal Injury

All incidents including fire, explosion, property damage, environmental release etc. will be responded in accordance with the AECOM site specific Health and Safety Plan. In general, this includes securing the site appropriate to the incident, turning control over the emergency responders, or securing the site and summoning appropriate remedial personnel or equipment. Gravity will immediately notify the client of any major incident, fire, equipment/ property damage, and environmental incident with a preliminary report. A full report will be provided within 72 hours.

7.3 Site Emergency Information

Table 7-1
Site Emergency Form / Emergency Phone Numbers*

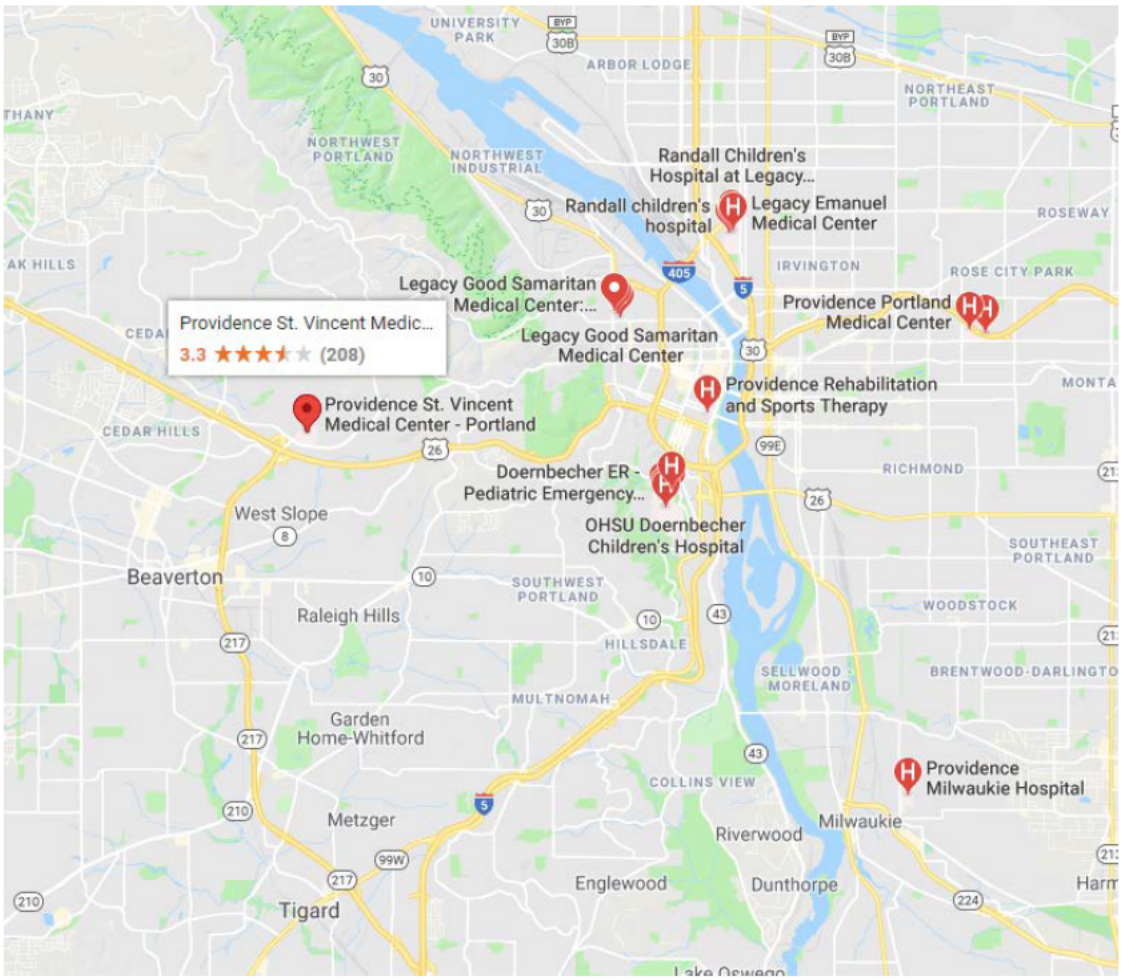
Category	Information
Possible Contaminants of Concern	Heavy Metals, organics
Minimum Level of Protection	Level D
Site(s) Location Address	Fred Devine and Salvage
Emergency Phone Numbers	
Contact	Project Manager (b) (6)
Ambulance	15
Fire	15
Police	16
Poison Control	1-800-222-1212
Project Manager (PM)	Shawn Hinz
Site Supervisor (SS)	Chad Furulie
Site Health and Safety Officer (SHSO)	Jeff Wilson
Project Health and Safety Manager (PHSM)	Jeff Wilson

National Response Center	1-800-424-8802

**In the event of any emergency contact the Project Manager (PM) or the Health and Safety Representatives (SHSO or Project CIH)*

Table 7-2
Hospital Information: TBD

Category	Information
Name:	Providence St. Vincent Medical Center
Address:	9205 SW Barnes Rd,
City, State:	Portland, OR 97225
Phone:	(503) 216-1234
Emergency Phone:	



APPENDICES

GRAVITY Consulting LLC

Appendix A
Safety Plan Acknowledgement Form

Safety Plan Acknowledgement Form

Project #: 081236 **Project Name:**

I have read the site-safety plan for this site and fully understand its contents.

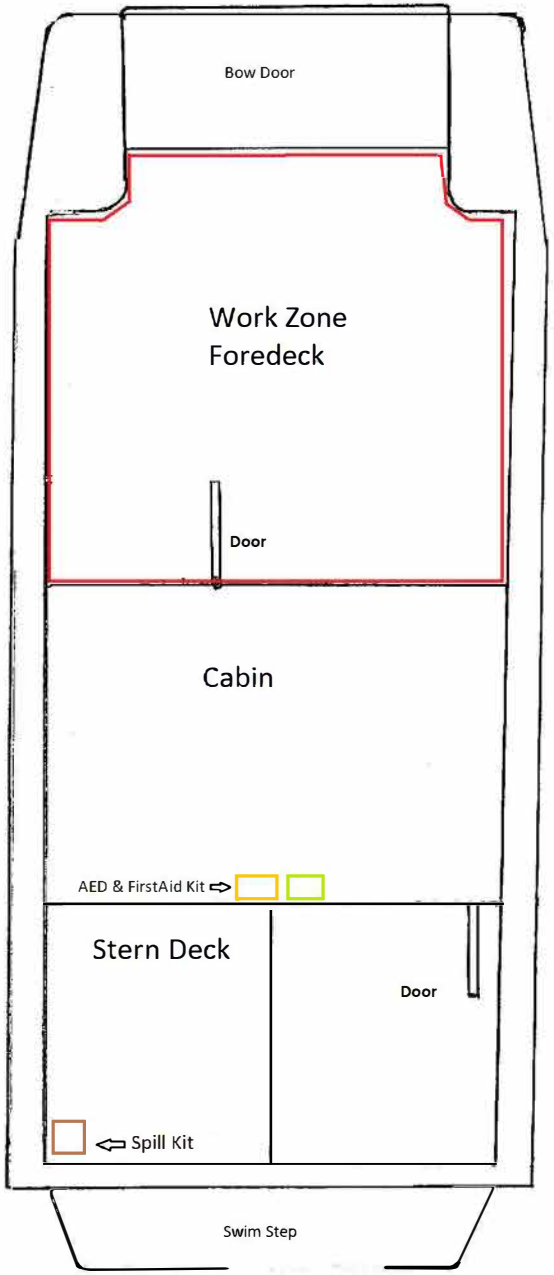
Date	Name	Company

Appendix
B
Offshore Medical Certifications

Appendix
B
Offshore Medical Certifications

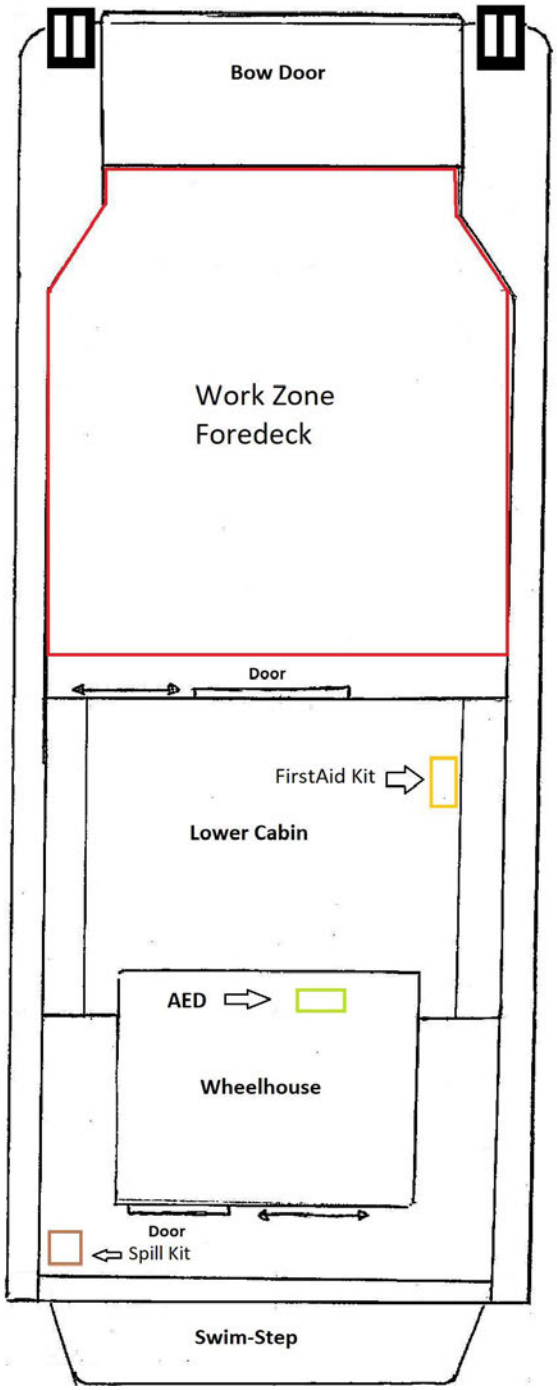
RV Cayuse

Gravity Marine



RV - Tieton

Gravity Marine



Safety Data Sheet

according to 29CFR1910/1200 and GHS Rev. 3

Effective date : 01.08.2015

Methanol, Lab Grade, 4L

SECTION 1 : Identification of the substance/mixture and of the supplier

Product name : **Methanol, Lab Grade, 4L**

Manufacturer/Supplier Trade name:

Manufacturer/Supplier Article number: S25426A

Recommended uses of the product and uses restrictions on use:

Manufacturer Details:

AquaPhoenix Scientific
9 Barnhart Drive, Hanover, PA 17331

Supplier Details:

Fisher Science Education
15 Jet View Drive, Rochester, NY 14624

Emergency telephone number:

Fisher Science Education Emergency Telephone No.: 800-535-5053

SECTION 2 : Hazards identification

Classification of the substance or mixture:

Flammable
Flammable liquids, category 2

Toxic
Acute toxicity (oral, dermal, inhalation), category 3

Health hazard
Specific target organ toxicity following single exposure, category 1

AcTox Dermal. 3
Flammable liq. 2
AcTox Oral. 3
AcTox Inhaln. 3
Stot SE. 1

Signal word :Danger

Hazard statements:
Highly flammable liquid and vapour
Toxic if swallowed
Toxic in contact with skin
Toxic if inhaled
Causes damage to organs
Precautionary statements:
If medical advice is needed, have product container or label at hand
Keep out of reach of children
Read label before use

Wear protective gloves/protective clothing/eye protection/face protection
Wash skin thoroughly after handling
Do not eat, drink or smoke when using this product
Avoid breathing dust/fume/gas/mist/vapours/spray
Keep away from heat/sparks/open flames/hot surfaces. No smoking
Do not breathe dust/fume/gas/mist/vapours/spray
Specific treatment (see supplemental first aid instructions on this label)
IF ON SKIN: Wash with soap and water
Call a POISON CENTER or doctor/physician if you feel unwell
Specific measures (see supplemental first aid instructions on this label)
Take off contaminated clothing and wash before reuse
Wash contaminated clothing before reuse
IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician
IF exposed: Call a POISON CENTER or doctor/physician
IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing
Store locked up
Store in a well ventilated place. Keep cool
Dispose of contents and container as instructed in Section 13

Other Non-GHS Classification:

WHMIS

B2

D1B

D2B

NFPA/HMIS

NFPA SCALE (0-4)

Health	2
Flammability	3
Physical Hazard	0
Personal Protection	X

HMIS RATINGS (0-4)

SECTION 3 : Composition/information on ingredients

Ingredients:		
CAS 67-56-1	Methanol	>90 %

Percentages are by weight

SECTION 4 : First aid measures

Description of first aid measures

After inhalation: Move exposed individual to fresh air. Loosen clothing as necessary and position individual in a comfortable position.Get medical assistance.If breathing is difficult, give oxygen

After skin contact: Wash affected area with soap and water. Rinse/flush exposed skin gently using water for 15-20 minutes. Seek medical attention if irritation persists or if concerned.

After eye contact: Protect unexposed eye. Rinse or flush eye gently with water for at least 15-20 minutes, lifting upper and lower lids.Seek medical attention if irritation persists or if concerned

After swallowing: Rinse mouth thoroughly. Do not induce vomiting. Have exposed individual drink sips of water. Dilute mouth with water or milk after rinsing.Get medical assistance.

Most important symptoms and effects, both acute and delayed:

Poison. Toxic by ingestion, absorption through skin and inhalation, potentially causing irreversible effects. Irritating to eyes, skin, and respiratory tract. Irritation- all routes of exposure.Shortness of breath.Nausea.Headache.May be fatal or cause blindness if swallowed. Cannot be made non-poisonous. May cause gastrointestinal irritation, vomiting, and diarrhea. Central nervous system disorders. Skin disorders, preexisting eye disorders, gastrointestinal tract;Toxic: danger of very serious irreversible effects by inhalation, ingestion or absorption through skin. Experiments have shown reproductive toxicity effects on laboratory animals. May cause adverse kidney and liver effects

Indication of any immediate medical attention and special treatment needed:

If seeking medical attention, provide SDS document to physician.Physician should treat symptomatically.

SECTION 5 : Firefighting measures

Extinguishing media

Suitable extinguishing agents: Dry chemical, foam, dry sand, or Carbon Dioxide.Water spray can keep containers cool.

For safety reasons unsuitable extinguishing agents: Water may be ineffective.

Special hazards arising from the substance or mixture:

Risk of ignition. Vapors may form explosive mixtures with air. Vapors may travel to source of ignition and flash back. Containers may explode when heated

Advice for firefighters:

Protective equipment: Wear protective eyeware, gloves, and clothing. Refer to Section 8.

Additional information (precautions): Remove all sources of ignition. Avoid contact with skin, eyes, and clothing.Ensure adequate ventilation.Take precautions against static discharge.

SECTION 6 : Accidental release measures

Personal precautions, protective equipment and emergency procedures:

Use spark-proof tools and explosion-proof equipment.Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapor and mists below the applicable workplace exposure limits (Occupational Exposure Limits-OELs) indicated above.Ensure adequate ventilation.

Environmental precautions:

Prevent from reaching drains, sewer or waterway. Should not be released into environment.

Methods and material for containment and cleaning up:

If necessary use trained response staff or contractor. Remove all sources of ignition. Contain spillage and then

collect. Do not flush to sewer.Absorb with a noncombustible absorbent material such as sand or earth and containerize for disposal. Ventilate area of leak or spill.Use spark-proof tools and explosion-proof equipment.Follow proper disposal methods. Refer to Section 13.

Reference to other sections:

SECTION 7 : Handling and storage

Precautions for safe handling:

Use in a chemical fume hood. Wash hands before breaks and immediately after handling the product.Avoid contact with skin, eyes, and clothing.Take precautions against static discharge.

Conditions for safe storage, including any incompatibilities:

Store in a cool location. Provide ventilation for containers. Avoid storage near extreme heat, ignition sources or open flame. Keep container tightly sealed.Store with like hazards. Protect from freezing and physical damage.

SECTION 8 : Exposure controls/personal protection

Control Parameters:	67-56-1, Methanol, ACGIH: 250 ppm STEL; 200 ppm TWA 67-56-1, Methanol, NIOSH: 250 ppm STEL; 325 mg/m3 STEL 67-56-1, Methanol, NIOSH: 200 ppm TWA; 260 mg/m3 TWA
Appropriate Engineering controls:	Emergency eye wash fountains and safety showers should be available in the immediate vicinity of use or handling. Ensure that dust-handling systems (exhaust ducts, dust collectors, vessels, and processing equipment) are designed to prevent the escape of dust into the work area.
Respiratory protection:	Use in a chemical fume hood. If exposure limit is exceeded, a full-face respirator with organic cartridge may be worn.
Protection of skin:	Select glove material impermeable and resistant to the substance.Select glove material based on rates of diffusion and degradation.
Eye protection:	Safety glasses with side shields or goggles.
General hygienic measures:	Wash hands before breaks and at the end of work. Avoid contact with the eyes and skin.Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices.Perform routine housekeeping.

SECTION 9 : Physical and chemical properties

Appearance (physical state,color):	Clear colorless liquid	**Explosion limit lower:** **Explosion limit upper:**	6 31
Odor:	Alcohol	**Vapor pressure:**	128 hPa @ 20°C
Odor threshold:	Not Available	**Vapor density:**	1.11
pH-value:	Not Available	**Relative density:**	0.79
Melting/Freezing point:	-98°C	**Solubilities:**	Miscible at 20 °C

Boiling point/Boiling range:	64.7°C @ 760mmHg	**Partition coefficient (n-octanol/water):**	Not Available
Flash point (closed cup):	12°C	**Auto/Self-ignition temperature:**	455°C
Evaporation rate:	5.2	**Decomposition temperature:**	Not Available
Flammability (solid,gaseous):	Flammable	**Viscosity:**	a. Kinematic:Not Available b. Dynamic: Not Available
Density: Not Available			

SECTION 10 : Stability and reactivity

Reactivity: Vapours may form explosive mixture with air.
Chemical stability: Stable under normal conditions.
Possible hazardous reactions: None under normal processing.
Conditions to avoid: Excess heat, Incompatible Materials, flames, or sparks.
Incompatible materials: Oxidizing agents, reducing agents, alkali metals, acids, sodium, potassium, metals as powders, acid chlorides, acid anhydrides, powdered magnesium, and aluminum.
Hazardous decomposition products:carbon monoxide, formaldehyde.

SECTION 11 : Toxicological information

Acute Toxicity:		
Dermal:	(rabbit)	LD-50 15800 mg/kg
Oral:	(rat)	LD-50 5628 mg/kg
Inhalation:	(rat)	LC-50 130,7 mg/l
Chronic Toxicity: No additional information.		
Corrosion Irritation:		
Ocular:		Irritating to eyes
Dermal:		Irritating to skin
Sensitization:		No additional information.
Single Target Organ (STOT):		Classified as causing damage to organs:Eyes, skin, optic nerve, gastrointestinal tract, central nervous system, respiratory system, liver, spleen, kidney, blood
Numerical Measures:		No additional information.
Carcinogenicity:		Teratogenicity : has occurred in experimental animals.
Mutagenicity:		Mutagenetic effects have occurred in experimental animals.

Reproductive Toxicity:	Developmental Effects (Immediate/Delayed) have occurred in experimental animals

SECTION 12 : Ecological information

Ecotoxicity

Freshwater Fish: 96 Hr LC50 Pimephales promelas: 28200 mg/L

Freshwater Fish: 96 Hr LC50 Oncorhynchus mykiss: 19500 - 20700 mg/L

Freshwater Fish: 96 Hr LC50 Pimephales promelas: >100 mg/L

Freshwater Fish: 96 Hr LC50 Oncorhynchus mykiss: 18 - 20 mL/L

Freshwater Fish: 96 Hr LC50 Lepomis macrochirus: 13500 - 17600 mg/L

Persistence and degradability: Not persistant.
Bioaccumulative potential: Not Bioaccumulative.
Mobility in soil: Aqueous solution has high mobility in soil.
Other adverse effects:

SECTION 13 : Disposal considerations

Waste disposal recommendations:

Methanol RCRA waste code U154. Do not allow product to reach sewage system or open water.It is the responsibility of the waste generator to properly characterize all waste materials according to applicable regulatory entities (US 40CFR262.11). Absorb with a noncombustible absorbent material such as sand or earth and containerize for disposal. Provide ventilation. Have fire extinguishing agent available in case of fire. Eliminate all sources of ignition.Use spark-proof tools and explosion-proof equipment.Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. Chemical waste generators must also consult local, regional, and national hazardous waste regulations. Ensure complete and accurate classification.

SECTION 14 : Transport information

UN-Number

UN1230

UN proper shipping name

Methanol

Transport hazard class(es)

Class:
3 Flammable liquids

Class:
6.1 Toxic substances

Packing group:II
Environmental hazard:
Transport in bulk:
Special precautions for user:

SECTION 15 : Regulatory information

United States (USA)

SARA Section 311/312 (Specific toxic chemical listings):

Acute, Chronic, Fire

SARA Section 313 (Specific toxic chemical listings):

67-56-1 Methanol

RCRA (hazardous waste code):

67-56-1 Methanol RCRA waste code U154

TSCA (Toxic Substances Control Act):

All ingredients are listed.

CERCLA (Comprehensive Environmental Response, Compensation, and Liability Act):

67-56-1 Methanol 5000 lbs

Proposition 65 (California):

Chemicals known to cause cancer:

None of the ingredients is listed

Chemicals known to cause reproductive toxicity for females:

None of the ingredients is listed

Chemicals known to cause reproductive toxicity for males:

None of the ingredients is listed

Chemicals known to cause developmental toxicity:

67-56-1 Methanol

Canada

Canadian Domestic Substances List (DSL):

All ingredients are listed.

Canadian NPRI Ingredient Disclosure list (limit 0.1%):

None of the ingredients is listed

Canadian NPRI Ingredient Disclosure list (limit 1%):

67-56-1 Methanol

SECTION 16 : Other information

This product has been classified in accordance with hazard criteria of the Controlled Products Regulations and the SDS contains all the information required by the Controlled Products Regulations.Note:. The responsibility to provide a safe workplace remains with the user.The user should consider the health hazards and safety information contained herein as a guide and should take those precautions required in an individual operation to instruct employees and develop work practice procedures for a safe work environment.The information contained herein is, to the best of our knowledge and belief, accurate.However, since the conditions of handling and use are beyond our control, we make no guarantee of results, and assume no liability for damages incurred by the use of this material.It is the responsibility of the user to comply with all applicable laws and regulations applicable to this material.

GHS Full Text Phrases:

Abbreviations and acronyms:

IMDG: International Maritime Code for Dangerous Goods
PNEC: Predicted No-Effect Concentration (REACH)

CFR: Code of Federal Regulations (USA)
SARA: Superfund Amendments and Reauthorization Act (USA)
RCRA: Resource Conservation and Recovery Act (USA)
TSCA: Toxic Substances Control Act (USA)
NPRI: National Pollutant Release Inventory (Canada)
DOT: US Department of Transportation
IATA: International Air Transport Association
GHS: Globally Harmonized System of Classification and Labelling of Chemicals
ACGIH: American Conference of Governmental Industrial Hygienists
CAS: Chemical Abstracts Service (division of the American Chemical Society)
NFPA: National Fire Protection Association (USA)
HMIS: Hazardous Materials Identification System (USA)
WHMIS: Workplace Hazardous Materials Information System (Canada)
DNEL: Derived No-Effect Level (REACH)

Effective date : 01.08.2015
Last updated : 03.27.2015

Safety Data Sheet

according to 1907/2006/EC (REACH), 1272/2008/EC (CLP), 29CFR1910/1200 and GHS Rev. 3

Effective date: 12.08.2015 **Revision** : 12.10.2015

Trade Name: Alconox

1 Identification of the substance/mixture and of the supplier

1.1 Product identifier

Trade Name: Alconox
Synonyms:
Product number: Alconox

1.2 Application of the substance / the mixture : Cleaning material/Detergent

1.3 Details of the supplier of the Safety Data Sheet

Manufacturer
Alconox, Inc.
30 Glenn Street
White Plains, NY 10603
1-914-948-4040

Supplier
Not Applicable

Emergency telephone number:
ChemTel Inc
North America: 1-800-255-3924
International: 01-813-248-0585

2 Hazards Identification

2.1 Classification of the substance or mixture:

In compliance with EC regulation No. 1272/2008, 29CFR1910/1200 and GHS Rev. 3 and amendments.

Hazard-determining components of labeling:
Tetrasodium Pyrophosphate
Sodium tripolyphosphate
Sodium Alkylbenzene Sulfonate

2.2 Label elements:

Skin irritation, category 2.
Eye irritation, category 2A.

Hazard pictograms:

Signal word: Warning

Hazard statements:
H315 Causes skin irritation.
H319 Causes serious eye irritation.

Precautionary statements:
P264 Wash skin thoroughly after handling.
P280 Wear protective gloves/protective clothing/eye protection/face protection.
P302+P352 If on skin: Wash with soap and water.
P305+P351+P338 If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses if present and easy to do. Continue rinsing.
P321 Specific treatment (see supplemental first aid instructions on this label).
P332+P313 If skin irritation occurs: Get medical advice/attention.
P362 Take off contaminated clothing and wash before reuse.
P501 Dispose of contents and container as instructed in Section 13.

Safety Data Sheet

according to 1907/2006/EC (REACH), 1272/2008/EC (CLP), 29CFR1910/1200 and GHS Rev. 3

Effective date: 12.08.2015 **Revision** : 12.10.2015

Trade Name: Alconox

Additional information: None.

Hazard description

Hazards Not Otherwise Classified (HNOC): None

Information concerning particular hazards for humans and environment:

The product has to be labelled due to the calculation procedure of the "General Classification guideline for preparations of the EU" in the latest valid version.

Classification system:

The classification is according to EC regulation No. 1272/2008, 29CFR1910/1200 and GHS Rev. 3 and amendments, and extended by company and literature data. The classification is in accordance with the latest editions of international substances lists, and is supplemented by information from technical literature and by information provided by the company.

3 Composition/Information on ingredients

3.1 Chemical characterization : None

3.2 Description : None

3.3 Hazardous components (percentages by weight)

Identification	Chemical Name	Classification	Wt. %
CAS number: 7758-29-4	Sodium tripolyphosphate	Skin Irrit. 2 ; H315 Eye Irrit. 2; H319	12-28
CAS number: 68081-81-2	Sodium Alkylbenzene Sulfonate	Acute Tox. 4; H303 Skin Irrit. 2 ; H315 Eye Irrit. 2; H319	8-22
CAS number: 7722-88-5	Tetrasodium Pyrophosphate	Skin Irrit. 2 ; H315 Eye Irrit. 2; H319	2-16

3.4 Additional Information : None.

4 First aid measures

4.1 Description of first aid measures

General information: None.

After inhalation:

Maintain an unobstructed airway.
Loosen clothing as necessary and position individual in a comfortable position.

After skin contact:

Wash affected area with soap and water.
Seek medical attention if symptoms develop or persist.

After eye contact:

Rinse/flush exposed eye(s) gently using water for 15-20 minutes.
Remove contact lens(es) if able to do so during rinsing.
Seek medical attention if irritation persists or if concerned.

After swallowing:

Rinse mouth thoroughly.
Seek medical attention if irritation, discomfort, or vomiting persists.

Safety Data Sheet

according to 1907/2006/EC (REACH), 1272/2008/EC (CLP), 29CFR1910/1200 and GHS Rev. 3

Effective date: 12.08.2015 **Revision** : 12.10.2015

Trade Name: Alconox

4.2 Most important symptoms and effects, both acute and delayed

None

4.3 Indication of any immediate medical attention and special treatment needed:

No additional information.

5 Firefighting measures

5.1 Extinguishing media

Suitable extinguishing agents:

Use appropriate fire suppression agents for adjacent combustible materials or sources of ignition.

For safety reasons unsuitable extinguishing agents : None

5.2 Special hazards arising from the substance or mixture :

Thermal decomposition can lead to release of irritating gases and vapors.

5.3 Advice for firefighters

Protective equipment:

Wear protective eye wear, gloves and clothing.
Refer to Section 8.

5.4 Additional information :

Avoid inhaling gases, fumes, dust, mist, vapor and aerosols.
Avoid contact with skin, eyes and clothing.

6 Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures :

Ensure adequate ventilation.
Ensure air handling systems are operational.

6.2 Environmental precautions :

Should not be released into the environment.
Prevent from reaching drains, sewer or waterway.

6.3 Methods and material for containment and cleaning up :

Wear protective eye wear, gloves and clothing.

6.4 Reference to other sections : None

7 Handling and storage

7.1 Precautions for safe handling :

Avoid breathing mist or vapor.
Do not eat, drink, smoke or use personal products when handling chemical substances.

7.2 Conditions for safe storage, including any incompatibilities :

Store in a cool, well-ventilated area.

7.3 Specific end use(s):

No additional information.

Safety Data Sheet

according to 1907/2006/EC (REACH), 1272/2008/EC (CLP), 29CFR1910/1200 and GHS Rev. 3

Effective date: 12.08.2015 **Revision** : 12.10.2015

Trade Name: Alconox

8 Exposure controls/personal protection

8.1 Control parameters :

7722-88-5, Tetrasodium Pyrophosphate, OSHA TWA 5 mg/m3.

8.2 Exposure controls

Appropriate engineering controls:

Emergency eye wash fountains and safety showers should be available in the immediate vicinity of use or handling.

Respiratory protection:

Not needed under normal conditions.

Protection of skin:

Select glove material impermeable and resistant to the substance.

Eye protection:

Safety goggles or glasses, or appropriate eye protection.

General hygienic measures:

Wash hands before breaks and at the end of work.
Avoid contact with skin, eyes and clothing.

9 Physical and chemical properties

Appearance (physical state, color):	White and cream colored flakes - powder	**Explosion limit lower:** **Explosion limit upper:**	Not determined or not available. Not determined or not available.
Odor:	Not determined or not available.	**Vapor pressure at 20°C:**	Not determined or not available.
Odor threshold:	Not determined or not available.	**Vapor density:**	Not determined or not available.
pH-value:	9.5 (aqueous solution)	**Relative density:**	Not determined or not available.
Melting/Freezing point:	Not determined or not available.	**Solubilities:**	Not determined or not available.
Boiling point/Boiling range:	Not determined or not available.	**Partition coefficient (n-octanol/water):**	Not determined or not available.
Flash point (closed cup):	Not determined or not available.	**Auto/Self-ignition temperature:**	Not determined or not available.
Evaporation rate:	Not determined or not available.	**Decomposition temperature:**	Not determined or not available.

Safety Data Sheet

according to 1907/2006/EC (REACH), 1272/2008/EC (CLP), 29CFR1910/1200 and GHS Rev. 3

Effective date: 12.08.2015 **Revision** : 12.10.2015

Trade Name: Alconox

Flammability (solid, gaseous):	Not determined or not available.	**Viscosity:**	a. Kinematic: Not determined or not available. b. Dynamic: Not determined or not available.
Density at 20°C:	Not determined or not available.		

10 Stability and reactivity

10.1 Reactivity : None

10.2 Chemical stability : None

10.3 Possibility hazardous reactions : None

10.4 Conditions to avoid : None

10.5 Incompatible materials : None

10.6 Hazardous decomposition products : None

11 Toxicological information

11.1 Information on toxicological effects :

Acute Toxicity:

Oral:

: LD50 > 5000 mg/kg oral rat - Product .

Chronic Toxicity: No additional information.

Skin corrosion/irritation:

Sodium Alkylbenzene Sulfonate: Causes skin irritation. .

Serious eye damage/irritation:

Sodium Alkylbenzene Sulfonate: Causes serious eye irritation .

Tetrasodium Pyrophosphate: Rabbit - Risk of serious damage to eyes .

Respiratory or skin sensitization: No additional information.

Carcinogenicity: No additional information.

IARC (International Agency for Research on Cancer): None of the ingredients are listed.

NTP (National Toxicology Program): None of the ingredients are listed.

Germ cell mutagenicity: No additional information.

Reproductive toxicity: No additional information.

STOT-single and repeated exposure: No additional information.

Additional toxicological information: No additional information.

12 Ecological information

Safety Data Sheet

according to 1907/2006/EC (REACH), 1272/2008/EC (CLP), 29CFR1910/1200 and GHS Rev. 3

Effective date: 12.08.2015 **Revision** : 12.10.2015

Trade Name: Alconox

12.1 Toxicity:

Sodium Alkylbenzene Sulfonate: Fish, LC50 1.67 mg/l, 96 hours.
Sodium Alkylbenzene Sulfonate: Aquatic invertebrates, EC50 Daphnia 2.4 mg/l, 48 hours.
Sodium Alkylbenzene Sulfonate: Aquatic Plants, EC50 Algae 29 mg/l, 96 hours.
Tetrasodium Pyrophosphate: Fish, LC50 - other fish - 1,380 mg/l - 96 h.
Tetrasodium Pyrophosphate: Aquatic invertebrates, EC50 - Daphnia magna (Water flea) - 391 mg/l - 48 h.

12.2 Persistence and degradability: No additional information.

12.3 Bioaccumulative potential: No additional information.

12.4 Mobility in soil: No additional information.

General notes: No additional information.

12.5 Results of PBT and vPvB assessment:

PBT: No additional information.

vPvB: No additional information.

12.6 Other adverse effects: No additional information.

13 Disposal considerations

13.1 Waste treatment methods (consult local, regional and national authorities for proper disposal)

Relevant Information:

It is the responsibility of the waste generator to properly characterize all waste materials according to applicable regulatory entities. (US 40CFR262.11).

14 Transport information

14.1 UN Number: ADR, ADN, DOT, IMDG, IATA		None
14.2 UN Proper shipping name: ADR, ADN, DOT, IMDG, IATA		None
14.3 Transport hazard classes: ADR, ADN, DOT, IMDG, IATA	**Class:**	None
	Label:	None
	LTD. QTY:	None

US DOT

Limited Quantity Exception: None

Bulk:
RQ (if applicable): None
Proper shipping Name: None
Hazard Class: None
Packing Group: None
Marine Pollutant (if applicable): No additional information.

Non Bulk:
RQ (if applicable): None
Proper shipping Name: None
Hazard Class: None
Packing Group: None
Marine Pollutant (if applicable): No additional information.

Safety Data Sheet

according to 1907/2006/EC (REACH), 1272/2008/EC (CLP), 29CFR1910/1200 and GHS Rev. 3

Effective date: 12.08.2015 **Revision** : 12.10.2015

Trade Name: Alconox

	Comments: None	**Comments:** None
14.4	**Packing group:** ADR, ADN, DOT, IMDG, IATA	None
14.5	**Environmental hazards** :	None
14.6	**Special precautions for user:**	None
	Danger code (Kemler):	None
	EMS number:	None
	Segregation groups:	None
14.7	**Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code:** Not applicable.	
14.8	**Transport/Additional information:**	
	Transport category:	None
	Tunnel restriction code:	None
	UN "Model Regulation":	None

15 Regulatory information

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture.

North American

SARA

Section 313 (specific toxic chemical listings): None of the ingredients are listed.
Section 302 (extremely hazardous substances): None of the ingredients are listed.

CERCLA (Comprehensive Environmental Response, Clean up and Liability Act) Reportable Spill Quantity: None of the ingredients are listed.

TSCA (Toxic Substances Control Act):

Inventory: All ingredients are listed.
Rules and Orders: Not applicable.

Proposition 65 (California):

Chemicals known to cause cancer: None of the ingredients are listed.

Chemicals known to cause reproductive toxicity for females: None of the ingredients are listed.

Chemicals known to cause reproductive toxicity for males: None of the ingredients are listed.

Chemicals known to cause developmental toxicity: None of the ingredients are listed.

Canadian

Canadian Domestic Substances List (DSL):
All ingredients are listed.

EU

REACH Article 57 (SVHC): None of the ingredients are listed.

Safety Data Sheet

according to 1907/2006/EC (REACH), 1272/2008/EC (CLP), 29CFR1910/1200 and GHS Rev. 3

Effective date: 12.08.2015 **Revision** : 12.10.2015

Trade Name: Alconox

Germany MAK: Not classified.

Asia Pacific

Australia

Australian Inventory of Chemical Substances (AICS): All ingredients are listed.

China

Inventory of Existing Chemical Substances in China (IECSC): All ingredients are listed.

Japan

Inventory of Existing and New Chemical Substances (ENCS): All ingredients are listed.

Korea

Existing Chemicals List (ECL): All ingredients are listed.

New Zealand

New Zealand Inventory of Chemicals (NZOIC): All ingredients are listed.

Philippines

Philippine Inventory of Chemicals and Chemical Substances (PICCS): All ingredients are listed.

Taiwan

Taiwan Chemical Substance Inventory (TSCI): All ingredients are listed.

16 Other information

Abbreviations and Acronyms: None

Summary of Phrases

Hazard statements:

H315 Causes skin irritation.
H319 Causes serious eye irritation.

Precautionary statements:

P264 Wash skin thoroughly after handling.
P280 Wear protective gloves/protective clothing/eye protection/face protection.
P302+P352 If on skin: Wash with soap and water.
P305+P351+P338 If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses if present and easy to do. Continue rinsing.
P321 Specific treatment (see supplemental first aid instructions on this label).
P332+P313 If skin irritation occurs: Get medical advice/attention.
P362 Take off contaminated clothing and wash before reuse.
P501 Dispose of contents and container as instructed in Section 13.

Manufacturer Statement:

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

NFPA: 1-0-0

Safety Data Sheet

according to 1907/2006/EC (REACH), 1272/2008/EC (CLP), 29CFR1910/1200 and GHS Rev. 3

Effective date: 12.08.2015 **Revision** : 12.10.2015

Trade Name: Alconox

HMIS: 1-0-0

Nitric Acid, 3M

SECTION 1 : Identification of the substance/mixture and of the supplier

Product name : **Nitric Acid, 3M**

Manufacturer/Supplier Trade name:

Manufacturer/Supplier Article number: **S25860**

Recommended uses of the product and uses restrictions on use:

Manufacturer Details:

AquaPhoenix Scientific
9 Barnhart Drive, Hanover, PA 17331

Supplier Details:

Fisher Science Education
15 Jet View Drive, Rochester, NY 14624

Emergency telephone number:

Fisher Science Education Emergency Telephone No.: 800-535-5053

SECTION 2 : Hazards identification

Classification of the substance or mixture:

Oxidizing
Oxidizing liquids, category 3

Corrosive
Serious eye damage, category 1
Skin corrosion, category 1B

Ox. liq. 3
Skin corrosion/irritation - Skin Corr. 1B
Eye Damage 1

Signal word :Danger

Hazard statements:
May intensify fire; oxidizer
Causes severe skin burns and eye damage
Causes serious eye damage
Precautionary statements:
If medical advice is needed, have product container or label at hand
Keep out of reach of children
Read label before use
Keep away from heat/sparks/open flames/hot surfaces. No smoking
Wear protective gloves/protective clothing/eye protection/face protection
Do not breathe dust/fume/gas/mist/vapours/spray
Do not eat, drink or smoke when using this product
Take any precaution to avoid mixing with combustibles
Keep/Store away from clothing/combustible materials
Wash skin thoroughly after handling
IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing

IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses if present and easy to do. Continue rinsing
Immediately call a POISON CENTER or doctor/physician
IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower
Wash contaminated clothing before reuse
IF SWALLOWED: Rinse mouth. Do NOT induce vomiting
Specific treatment (see supplemental first aid instructions on this label)
In case of fire: Use agents recommended in section 5 for extinction
Store locked up
Dispose of contents/container to ...

Other Non-GHS Classification:

WHMIS

C

E

NFPA/HMIS

NFPA SCALE (0-4)

Health	3
Flammability	0
Physical Hazard	2
Personal Protection	X

HMIS RATINGS (0-4)

SECTION 3 : Composition/information on ingredients

Ingredients:		
CAS 7697-37-2	Nitric Acid	26.03 %
CAS 7732-18-5	Deionized Water	73.97 %
		Percentages are by weight

SECTION 4 : First aid measures

Description of first aid measures

After inhalation: Move exposed individual to fresh air. Loosen clothing as necessary and position individual in a comfortable position.Seek medical advice if discomfort or irritation persists.

After skin contact: Wash affected area with soap and water. Rinse or flush skin/hair gently with water for at least 30 minutes.Seek immediate medical attention

After eye contact: Protect unexposed eye. Remove contact lens(es) if able to do so during rinsing. Rinse or flush eye gently with water for at least 30 minutes, lifting upper and lower lids.Seek immediate medical attention (ophthalmologist)

After swallowing: Rinse mouth thoroughly. Do not induce vomiting. Have exposed individual drink sips of water. Seek medical attention if irritation, discomfort or vomiting persists.

Most important symptoms and effects, both acute and delayed:

Headache, Shortness of breath.Irritation/burns, all routes of exposure.May cause severe burns, blindness and/or permanent damage. May cause burns, deep penetrating ulcerations of the skin, delayed tissue destruction, redness, pain. May cause gastrointestinal irritation with nausea, vomiting and diarrhea;

Indication of any immediate medical attention and special treatment needed:

If seeking medical attention, provide SDS document to physician.

SECTION 5 : Firefighting measures

Extinguishing media

Suitable extinguishing agents: Does not burn. Use extinguishing media appropriate for surrounding fire.If in laboratory setting, follow laboratory fire suppression procedures. Use appropriate fire suppression agents for adjacent combustible materials or sources of ignition

For safety reasons unsuitable extinguishing agents:

Special hazards arising from the substance or mixture:

Combustion products may include carbon oxides or other toxic vapors.Nitrogen oxides (NOx)

Advice for firefighters:

Protective equipment:

Additional information (precautions): Move product containers away from fire or keep cool with water spray as a protective measure, where feasible.

SECTION 6 : Accidental release measures

Personal precautions, protective equipment and emergency procedures:

Wear protective equipment. Use respiratory protective device against the effects of fumes/dust/aerosol. Keep unprotected persons away. Ensure adequate ventilation.Keep away from ignition sources. Protect from heat.Stop the spill, if possible. Contain spilled material by diking or using inert absorbent. Transfer to a disposal or recovery container.

Environmental precautions:

Prevent from reaching drains, sewer or waterway. Collect contaminated soil for characterization per Section 13

Methods and material for containment and cleaning up:

If in a laboratory setting, follow Chemical Hygiene Plan procedures.Collect liquids using vacuum or by use of absorbents. Place into properly labeled containers for recovery or disposal. If necessary, use trained response staff/contractor.

Reference to other sections:

SECTION 7 : Handling and storage

Precautions for safe handling:

Prevent formation of aerosols. Follow good hygiene procedures when handling chemical materials. Do not eat, drink, smoke, or use personal products when handling chemical substances. If in a laboratory setting, follow Chemical Hygiene Plan.Use only in well ventilated areas.Avoid splashes or spray in enclosed areas.No smoking.Keep away from heat and sources of ignition.

Conditions for safe storage, including any incompatibilities:

Store in a cool location. Provide ventilation for containers. Avoid storage near extreme heat, ignition sources or open flame. Store away from foodstuffs. Store away from oxidizing agents.Store in cool, dry conditions in well sealed containers. Keep container tightly sealed.Store with like hazards. Storage class (TRGS 510): Oxidizing

hazardous materials

SECTION 8 : Exposure controls/personal protection

Control Parameters: 7697-37-2, Nitric Acid, NIOSH 4 ppm STEL; 10 mg/m3 STEL
7697-37-2, Nitric Acid , NIOSH 2 ppm TWA; 5 mg/m3 TWA
7697-37-2 , Nitric Acid , ACGIH 4 ppm STEL
7697-37-2, Nitric Acid , ACGIH 2 ppm TWA

Appropriate Engineering controls: Emergency eye wash fountains and safety showers should be available in the immediate vicinity of use/handling.Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapor or mists below the applicable workplace exposure limits (Occupational Exposure Limits-OELs) indicated above.

Respiratory protection: Not required under normal conditions of use. Use suitable respiratory protective device when high concentrations are present. Use suitable respiratory protective device when aerosol or mist is formed. For spills, respiratory protection may be advisable.

Protection of skin: The glove material has to be impermeable and resistant to the product/ the substance/ the preparation being used/handled.Selection of the glove material on consideration of the penetration times, rates of diffusion and the degradation.

Eye protection: Safety glasses with side shields or goggles.

General hygienic measures: The usual precautionary measures are to be adhered to when handling chemicals. Keep away from food, beverages and feed sources. Immediately remove all soiled and contaminated clothing. Wash hands before breaks and at the end of work. Do not inhale gases/fumes/dust/mist/vapor/aerosols. Avoid contact with the eyes and skin.

SECTION 9 : Physical and chemical properties

Appearance (physical state,color):	colorless liquid	**Explosion limit lower:** **Explosion limit upper:**	Not Determined Not Determined
Odor:	strong acrid	**Vapor pressure:**	49 hPa (37 mmHg) at 50 °C (122 °F)
Odor threshold:	0.29 ppm	**Vapor density:**	2.5 (Air = 1)
pH-value:	<1.0	**Relative density:**	1.413 g/cm3 at 20 °C (68 °F)
Melting/Freezing point:	-41.6°C (-42.9°F)	**Solubilities:**	Soluble
Boiling point/Boiling range:	120.5 °C (248.9 °F)	**Partition coefficient (n-octanol/water):**	Not Determined
Flash point (closed cup):	Not Determined	**Auto/Self-ignition temperature:**	Not Determined

Evaporation rate:	Not Determined	**Decomposition temperature:**	Not Determined
Flammability (solid,gaseous):	Not Determined	**Viscosity:**	a. Kinematic:Not Determined b. Dynamic: Not Determined
Density: Not Determined			

SECTION 10 : Stability and reactivity

Reactivity: Oxidizer.Reacts violently with alcohol, organic material, turpene, charcoal. Violent reaction with Nitric acid + Acetone and Sulfuric acid. Nitric Acid will react with water or steam to produce heat and toxic, corrosive and flammable vapors. (Nitric acid, fuming)
Chemical stability: No decomposition if used and stored according to specifications.
Possible hazardous reactions: Oxidizer: Contact with combustible/organic material may cause fire
Conditions to avoid:excess heat.combustible materials.Incompatible Materials.
Incompatible materials: Highly reactive with alkalis.Reactive with reducing agents. combustible materials. organic materials,metals. Acids.Reducing agents.aldehydes.
Hazardous decomposition products: Nitrogen oxides (NOx)

SECTION 11 : Toxicological information

Acute Toxicity:		
Inhalation:	67 ppm 4 h	Inhalation LC50 Rat
Chronic Toxicity: No additional information.		
Corrosion Irritation:		
Dermal:		Rabbit: Corrosive
Ocular:		Rabbit: Corrosive to eyes
Dermal:	Section 2	Classified as causing severe skin burns and eye damage.
Ocular:	Section 2	Classified as causing serious eye damage
Sensitization:		No additional information.
Single Target Organ (STOT):		No additional information.
Numerical Measures:		No additional information.
Carcinogenicity:		No additional information.
Mutagenicity:		No additional information.
Reproductive Toxicity:		Experiments have shown reproductive toxicity effects on laboratory animals.

SECTION 12 : Ecological information

Ecotoxicity Persistence and degradability: Readily degradable in the environment.
Bioaccumulative potential:
Mobility in soil: Aqueous solution has high mobility in soil.

Other adverse effects:

SECTION 13 : Disposal considerations

Waste disposal recommendations:

Product/containers must not be disposed together with household garbage. Do not allow product to reach sewage system or open water.It is the responsibility of the waste generator to properly characterize all waste materials according to applicable regulatory entities (US 40CFR262.11). Consult federal state/ provincial and local regulations regarding the proper disposal of waste material that may incorporate some amount of this product.

SECTION 14 : Transport information

UN-Number

2031

UN proper shipping name

Nitric Acid

Transport hazard class(es)

Class:
8 Corrosive substances

Packing group:II
Environmental hazard:
Transport in bulk:
Special precautions for user:

SECTION 15 : Regulatory information

United States (USA)

SARA Section 311/312 (Specific toxic chemical listings):

Acute, Chronic

SARA Section 313 (Specific toxic chemical listings):

7697-37-2 Nitric Acid

RCRA (hazardous waste code):

None of the ingredients is listed

TSCA (Toxic Substances Control Act):

All ingredients are listed.

CERCLA (Comprehensive Environmental Response, Compensation, and Liability Act):

7697-37-2 Nitric acid 1000 lbs

Proposition 65 (California):

Chemicals known to cause cancer:

None of the ingredients is listed

Chemicals known to cause reproductive toxicity for females:

None of the ingredients is listed

Chemicals known to cause reproductive toxicity for males:

None of the ingredients is listed

Chemicals known to cause developmental toxicity:

None of the ingredients is listed

Canada

Canadian Domestic Substances List (DSL):

All ingredients are listed.

Canadian NPRI Ingredient Disclosure list (limit 0.1%):

None of the ingredients is listed

Canadian NPRI Ingredient Disclosure list (limit 1%):

7697-37-2 Nitric Acid

SECTION 16 : Other information

This product has been classified in accordance with hazard criteria of the Controlled Products Regulations and the SDS contains all the information required by the Controlled Products Regulations.Note:. The responsibility to provide a safe workplace remains with the user.The user should consider the health hazards and safety information contained herein as a guide and should take those precautions required in an individual operation to instruct employees and develop work practice procedures for a safe work environment.The information contained herein is, to the best of our knowledge and belief, accurate.However, since the conditions of handling and use are beyond our control, we make no guarantee of results, and assume no liability for damages incurred by the use of this material.It is the responsibility of the user to comply with all applicable laws and regulations applicable to this material.

GHS Full Text Phrases:

Abbreviations and acronyms:

IMDG: International Maritime Code for Dangerous Goods
PNEC: Predicted No-Effect Concentration (REACH)
CFR: Code of Federal Regulations (USA)
SARA: Superfund Amendments and Reauthorization Act (USA)
RCRA: Resource Conservation and Recovery Act (USA)
TSCA: Toxic Substances Control Act (USA)
NPRI: National Pollutant Release Inventory (Canada)
DOT: US Department of Transportation
IATA: International Air Transport Association
GHS: Globally Harmonized System of Classification and Labelling of Chemicals
ACGIH: American Conference of Governmental Industrial Hygienists
CAS: Chemical Abstracts Service (division of the American Chemical Society)
NFPA: National Fire Protection Association (USA)
HMIS: Hazardous Materials Identification System (USA)
WHMIS: Workplace Hazardous Materials Information System (Canada)
DNEL: Derived No-Effect Level (REACH)

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